



RESOURCE COMPILATION: TOOLKIT TO OVERCOME LEARNING LOSS

July 2020

INTRODUCTION

To support teachers in mitigating learning loss due to COVID-19 school closures, summer break, disabilities, personal situations, and other circumstances, this toolkit presents research-based best practices and instructional strategies for specific instructional areas or groups of students. Each section of this report contains strategies for a different instructional area or subgroup according to reports recently written by Hanover Research (Hanover), though teachers may find certain strategies applicable for more than one subject or group of students.

The following table of contents outlines the sections of this report, the associated reports that include best practices and strategies, a brief description of the report, and the page range that contains this information within this document. Each section title includes a hyperlink, indicated by orange and underlined text, which links to the beginning of the section. This table of contents allows readers to identify and locate information quickly and easily.

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SECTION I: LEARNING LOSS—ACADEMIC & SOCIAL-EMOTIONAL

In this section, Hanover compiles best practices, support strategies, and general guidance regarding academic and social-emotional learning loss. The section includes learning loss support strategies following a crisis or traumatic event, such as COVID-19, following summer vacation, and for general academic decline.

REPORT I: RESEARCH BRIEF—SOCIAL-EMOTIONAL AND ACADEMIC RECOVERY

INTRODUCTION

School districts across the country continue to grapple with impacts from the COVID-19 pandemic, including those related to school closures as well as health, social, financial, and emotional challenges in the larger community. While there are many uncertainties surrounding the re-opening of schools for the 2020-21 school year, most are anticipating significant social-emotional and academic challenges as students return. This report discusses recommended strategies and considerations for supporting students' social-emotional and academic needs following extended school closures and crisis events. This research brief draws on limited relevant research from other natural disasters and crises that resulted in school disruptions as well as broader literature on crisis recovery planning for schools. Finally, this report highlights emerging guidance and recommendations related to the COVID-19 pandemic specifically.

SOCIAL-EMOTIONAL RECOVERY

Past disasters and crisis events suggest that challenging family and community-level factors heighten social-emotional impacts for students. A 2015 literature review examined how familial and community factors influenced children's reactions to disasters, such as hurricanes, tsunamis, earthquakes, and terrorist incidents.¹ The authors found that low socioeconomic status, high parental stress levels, poor parental coping skills, intense media exposure, and secondary adversities – including “property damage,” “dislocation and relocation,” “disruption of services” (e.g., food, shelter, transportation), and “economic loss” – correlated with greater emotional distress among children.²

Conversely, strong social networks and supports may be protective against potential negative effects of a disaster. Social supports, provided by families, peers, schools, and other community resources, offer some protection against negative social-emotional outcomes.³

The recovery phase of any emergency or crisis requires additional support and attention around the mental health of students, staff, and families. Relevant student-related considerations for social-emotional and mental health recovery are listed below, followed by additional details on several specific strategies related to social-emotional recovery.⁴

- Counseling and psychological/mental health first aid (immediate, short-term, and long-term)
- In-class social and emotional support for students

¹ Pfefferbaum, B.A., A. Jacobs, J. Houston, and N. Griffin. “Children’s Disaster Reactions: The Influence of Family and Social Factors.” *Current Psychiatry Reports*, 17:7, June 2015.

https://www.researchgate.net/publication/276543203_Children%27s_Disaster_Reactions_the_Influence_of_Family_and_Social_Factors

² Ibid.

³ Ibid.

⁴ [1] “Developing a Recovery Annex,” Op. cit. [2] “Resources for School Recovery after COVID-19 Closures.” Texas State Texas School Safety Center, May 2020. <https://txssc.txstate.edu/topics/emergency-management/articles/school-recovery-covid-19> [3] “Guide for Developing High-Quality School Emergency Operations Plans,” Op. cit.

- Mental health needs assessment and monitoring
- Tracking of student attendance, behavior, and engagement in school
- Coordination with local mental health providers

PSYCHOLOGICAL FIRST AID

The American Federation for Teachers (AFT)'s [Plan to Safely Reopen America's Schools and Communities](https://www.aft.org/sites/default/files/covid19_reopen-america-schools.pdf) calls for schools and districts to train all staff on "how to identify students struggling with trauma and refer them to mental health professionals for additional support."⁵ Psychological First Aid (PFA) is one strategy that schools have used to support students and staff in the aftermath of other disasters and crises.⁶

Psychological First Aid for Schools (PFA-S) is a strategy specifically designed for use during the immediate recovery phase of a crisis or emergency. PFA-S seeks to "reduce the initial distress caused by emergencies, and to foster short- and long-term adaptive functioning and coping."⁷ The strategy can be delivered by any staff member, including those without specific mental health training.⁸

Preparations for the delivery of the PFA-S model include the following initial planning tasks:⁹

- **Consider the School's History and Climate** (e.g., other recent adverse events, current morale, upcoming events, recent changes, community partners, other personal trauma of staff and student).
- **Identify Distinguishing Features of the Event** (e.g., magnitude of event and trauma for staff, students, and community, level of exposure to event, rumors circulating about the event).
- **Be Aware of At-Risk Populations** (e.g., students and staff who are at special risk). Risk factors may include those with:
 - Direct exposure or injury
 - Death or serious injury of loved one
 - Close personal relationship with victim(s)
 - History of depression or suicidal thoughts
 - History of anxiety or low self-confidence
 - History of risk-taking behavior
 - Prior traumatic events (e.g., violence, abuse or neglect, economic disadvantage, medical vulnerability)
- **Be Sensitive to Racial and Cultural Diversity** (e.g., cultural, ethnic, religious, racial, and language differences).

The core actions of PFA-S begin with initial contact and stabilization followed by offering more targeted assistance, support, and coping strategies as needed. Finally, PFA-S should include connections with additional service providers.¹⁰

⁵ "A Plan to Safely Reopen America's Schools and Communities." American Federation of Teachers, May 2020, p. 10.

https://www.aft.org/sites/default/files/covid19_reopen-america-schools.pdf

⁶ "Psychological First Aid (PFA) for Students and Teachers." Ready, 2006.

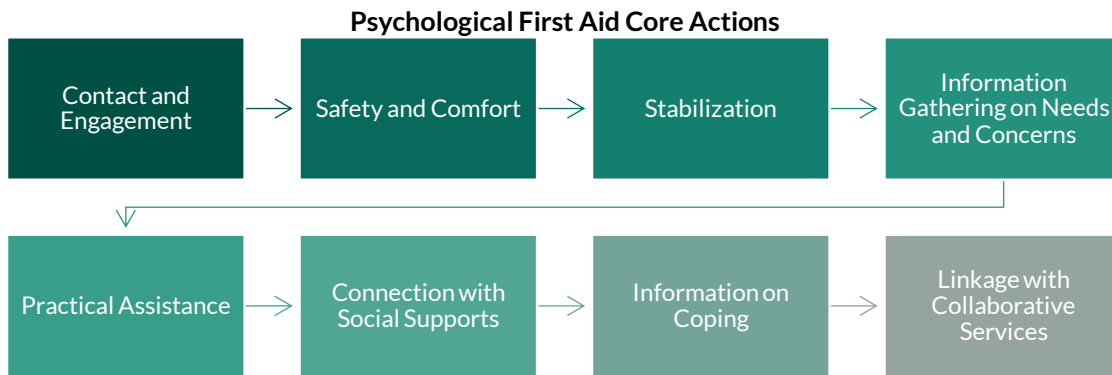
https://www.ready.gov/sites/default/files/documents/files/PFA_SchoolCrisis.pdf

⁷ "Psychological First Aid for Schools Field Operations Guide." National Traumatic Stress Network and National Center for PTSD, 2012, p. 3. https://www.nctsn.org/sites/default/files/resources//pfa_schools.pdf

⁸ Ibid., p. 5.

⁹ Bullet points adapted with minor revisions from: Ibid., p. 10-12.

¹⁰ Ibid., p. 17.



Source: National Child Traumatic Stress Network¹¹

Additional Psychological Resources

- **Psychological First Aid for Schools Field Operations Guide:** Resource from the National Child Traumatic Stress Network and National Center for PTSD on using PFA-S in school settings.
- **Psychological First Aid CDC Webinar:** April 2020 CDC webinar (1 hour recording and slides) on PFA and its implementation specifically in the context of disaster relief.
- **American Red Cross Psychological First Aid Certification:** Free online course designed specifically for response to the COVID-19 pandemic. Training is not specific to youth and schools, but covers basic information on PFA and applications for current crisis.

Source: National Child Traumatic Street Network, National Center for PTSD, Centers for Disease Control and Prevention, and American Red Cross¹²

FOCUS ON SOCIAL-EMOTIONAL LEARNING

As schools re-open for the 2020-21 school year education leaders are calling for a renewed focus on social-emotional learning (SEL) as part of re-opening plans.¹³ To support this effort, the Collaborative for Academic, Social, and Emotional Learning (CASEL) offers four “critical actions” to complete in preparation for school re-opening. These actions are listed below, however additional details and strategies can be found [here](#). CASEL anticipates releasing guidance, recommendations, and tools for SEL during the COVID-19 pandemic in late June, 2020.

Critical Actions for Leveraging the Power of SEL During School Re-Opening

| | |
|-----------------|---|
| Action 1 | Take time to build partnerships, deepen your understanding, and plan for SEL |
| Action 2 | Design opportunities for adults to connect, heal, and cultivate their own SEL competencies and capacities. |
| Action 3 | Create emotionally and physically safe, supportive, and engaging learning environments that promote all students’ social and emotional development. |
| Action 4 | Use data as an opportunity to deepen relationships and continuously improve support for students, families, and staff. |

Source: CASEL¹⁴

¹¹ Ibid.

¹² Figure resources obtained from: [1] Brymer, M. et al. “Psychological First Aid for Schools: Field Operations Guide, 2nd Edition.” National Child Traumatic Stress Network, 2012. https://www.nctsn.org/sites/default/files/resources/pfa_schools.pdf [2] “Psychological First Aid: Addressing Mental Health Distress During Disasters.” Centers for Disease Control and Prevention. https://emergency.cdc.gov/epic/learn/2020/webinar_20200422.asp [3] “Psychological First Aid Online Course.” American Red Cross. <https://www.redcross.org/take-a-class/coronavirus-information/psychological-first-aid-online-course>

¹³ Walker, T. “Social-Emotional Learning Should be Priority During COVID-19 Crisis.” NEA Today, April 2020. <http://neatoday.org/2020/04/15/social-emotional-learning-during-covid/>

¹⁴ Figure text taken verbatim from: “An Initial Guide to Leveraging the Power of Social and Emotional Learning.” CASEL, May 2020, p. 4. https://casel.org/wp-content/uploads/2020/05/CASEL_Leveraging-SEL-as-You-Prepare-to-Reopen-and-Renew.pdf

Additional SEL Resources


- **Leveraging the Power of SEL:** CASEL’s initial COVID-19 guide for districts and schools to incorporate SEL into reopening plans.
- **SEL in the Era of COVID-19:** Getting Smart article outlining considerations for SEL approaches during the COVID-19 pandemic.

Source: CASEL and Getting Smart¹⁵

TRAUMA-INFORMED PRACTICES

As districts consider how to support students in the midst of a traumatic event such as COVID-19, trauma-informed practices can be used to design supportive classroom and school environments.¹⁶

Guiding Principles of Trauma-Informed Practices

| | |
|---|--|
|  | Create predictable routines |
|  | Build strong & supportive relationships |
|  | Empower students' agency |
|  | Support the development of self-regulation skills |
|  | Provide opportunities to explore individual & community identities |

Source: Transforming Education¹⁷

In putting trauma-informed practices into action, schools should focus on observing the “4 Rs” in all interactions within the school community.¹⁸

4 R's of Trauma-Informed Schools

| | |
|-----------|--|
| R1 | Realizing the widespread impact of trauma and pathways to recovery |
| R2 | Recognizing traumas signs and symptoms |
| R3 | Responding by integrating knowledge about trauma into all facets of the system |
| R4 | Resisting re-traumatization of trauma-impacted individuals by decreasing the occurrence of unnecessary triggers and by implementing trauma-informed policies, procedures, and practices. |

Source: National Child Traumatic Stress Network¹⁹

¹⁵ Figure resources obtained from: [1] Ibid. [2] Jackson, L. “SEL in the Era of COVID-19.” Getting Smart, May 1, 2020. <https://www.gettingsmart.com/2020/05/sel-in-the-era-of-covid-19/>

¹⁶ “Trauma-Informed SEL Toolkit.” Transforming Education, January 2020. <https://www.transformingeducation.org/trauma-informed-sel-toolkit/>

¹⁷ Figure text taken verbatim from: Ibid.

¹⁸ “Creating, Supporting, and Sustaining Trauma-Informed Schools : A System Framework.” National Child Traumatic Stress Network, 2017, p. 4. https://www.nctsn.org/sites/default/files/resources/creating_supporting_sustaining_trauma_informed_schools_a_systems_framework.pdf

¹⁹ Figure text taken verbatim from: Ibid.

Additional Trauma-Informed Practices Resources

- **Framework for Trauma-Informed Schools:** The National Child Traumatic Stress Network's framework for trauma-informed schools.
- **Strategies for Trauma-Sensitive Schools:** Resource from the Wisconsin Department of Public Instruction for creating trauma-sensitive schools. Includes focus on academics, behavioral supports, and policies among several other areas.

Source: National Child Traumatic Stress Network and Wisconsin Department of Public Instruction²⁰

ACADEMIC RECOVERY

Academic impacts from natural disasters disproportionately affect students that are already at-risk. In a 2018 study of the academic recovery of schools impacted by Hurricane Ike, schools were classified as having a high-stable academic recovery trajectory or a low-interrupted trajectory. The study found that high attendance was associated with the high-stable trajectory while a high percentage of economically disadvantaged students was associated with the low-interrupted trajectory. These results show that natural disasters “do not affect all people or communities equally...[and] highlight the need for policy initiatives that focus on low performing schools” during the recovery period.²¹

School reforms undertaken during a disaster recovery have been shown to result in positive long-term student academic achievement. The unique circumstances around both the immediate and long-term aftermath of Hurricane Katrina in New Orleans make comparisons difficult. However, studies show that reforms undertaken in the New Orleans Public Schools (NOLA PS) after the disaster did have long-term positive impacts on multiple indicators of student academic achievement, high school graduation, and college enrollment, persistence, and graduation.²²

Researchers of the post-Katrina reforms in NOLA PS, while unlikely to be replicated in other situations, identified three distinctive strategies that were especially effective:²³

- **More Money:** Relative to comparable districts, NOLA PS reforms after Hurricane Katrina involved greater financial investment.
- **An Ample Educator Workforce:** New Orleans as a city and the school district as an extension benefited from an influx of early career educators and school reform leaders seeking to rebuild the city.
- **Low Starting Point:** Prior to Hurricane Katrina, student academic achievement in New Orleans was lower than comparable districts, suggesting that major reforms after a disaster may result in the greatest benefit for low-performing schools and students.

In the context of crisis recovery, academic recovery broadly relates to how schools will restore the learning environment and instruction. Given the ongoing nature of COVID-19, academic recovery may include plans for an extension of the current digital learning model, a hybrid in-person/online approach, or fully in-person

²⁰ Figure resources obtained from: “Creating, Supporting, and Sustaining Trauma-Informed Schools: A System Framework.” National Child Traumatic Stress Network, 2017.

https://www.nctsn.org/sites/default/files/resources/creating_supporting_sustaining_trauma_informed_schools_a_systems_framework.pdf [2] “Strategies and Resources to Create a Trauma-Sensitive School.” Wisconsin Department of Public Instruction. <https://dpi.wi.gov/sites/default/files/imce/sspw/pdf/traumastrategies.pdf>

²¹ Lai, B.S., et al. “Trajectories of School Recovery After a Natural Disaster: Risk and Protective Factors.” *Risk, Hazards & Crisis in Public Policy*, 10:1, 2018. <https://onlinelibrary.wiley.com/doi/full/10.1002/rhc3.12158>

²² Harris, D. N. and M. F. Larsen. “What Effect Did the New Orleans School Reforms have on Student Achievement, High School Graduation, and College Outcomes?” Education Research Alliance for New Orleans, 2018. <https://educationresearchalliancenaola.org/files/publications/071518-Harris-Larsen-What-Effect-Did-the-New-Orleans-School-Reforms-Have-on-Student-Achievement-High-School-Graduation-and-College-Outcomes.pdf>

²³ Bullet points adapted from: “Key Conclusions.” Education Research Alliance for New Orleans. <https://educationresearchalliancenaola.org/key-conclusions#conclusion-8>

instruction. The following subsections describe two broad strategies to support academic recovery. Additional topics to consider for planning academic recovery include:²⁴

- Plan for resuming academic activities and routines
- Use of alternative instructional delivery
- Use of alternative school day schedules
- Use of temporary or alternative instructional spaces

PLANNING FOR LEARNING LOSS

Districts should plan for greater than typical learning loss when students return for the 2020-21 school year, especially in math. As districts begin to shift focus towards planning for the 2020-21 school year, most are anticipating significant learning loss beyond the typical “summer slide.” Research from NEWA, the organization that administers the MAP test for Grades 3-8, predicts that based on typical learning loss between academic years that students will return for the 2020-21 school year “with roughly 70% of the learning gains in reading relative to a typical school year.” In math, learning gains are projected to be even smaller, potentially up to a year behind the typical level for some grade levels.²⁵ While similar data and projections are not currently available for high school grade levels, this suggests that incoming Grade 9 students may enter high school more behind than typical in both English and math, though math learning loss may be greater on the whole and require more targeted support at the beginning of the 2020-21 school year.

To account for anticipated learning loss, districts can facilitate a vertical curriculum review and collaboration across grade levels and courses. Teachers are the most knowledgeable of the specific competencies, topics, and skills that students may not have received or mastered during the 2019-20 school year due to school closures. These gaps should be identified and communicated across grade levels to allow for adjustments and additions to 2020-21 course curricula as students advance to the next grade level or progress to the next course in the sequence. In Ceres Unified School District (CA), teachers are currently working through a three-step process, illustrated below, to prepare to address learning loss. These “vertical conversations” are taking place at each grade level, with a special focus on transition years, such as Grade 9.²⁶

Vertical Conversations for 2020-21 Curriculum Planning

| | |
|---------------|--|
| Step 1 | Current grade level/course teachers documents unmet learning goals for class. |
| Step 2 | Vertical conversations between current and subsequent grade level/course teachers to identify a core set of learning areas and skills that should be revisited in 2020-21. |
| Step 3 | Teachers plan for how to incorporate identified gaps into the 2020-21 curriculum. |

Source: Ceres Unified School District²⁷

Prior school closures suggest that districts should develop a long-term strategy to address lost learning. A 2019 study of the 2009 Australian bushfire found that a disaster may erode learning across multiple academic years. The study analyzed students’ test scores from Grade 1 (the year of the bushfire), Grade 3, and Grade 5. When comparing results for Grades 3 and 5, the authors determined that students attending the most affected schools recorded significantly less improvement in reading and math.²⁸ Similarly, research on

²⁴ [1] “Developing a Recovery Annex,” Op. cit. [2] “Resources for School Recovery after COVID-19 Closures,” Op. cit. [3] “Guide for Developing High-Quality School Emergency Operations Plans,” Op. cit.

²⁵ Kuhfeld, M. and B. Tarasawa. “The COVID-10 Slide: What summer learning loss can tell us about the potential impact of school closures on student academic achievement.” NWEA Research, April 2020.
https://www.nwea.org/content/uploads/2020/05/Collaborative-Brief_Covid19-Slide-APR20.pdf

²⁶ “Strategies for School District Reopening Plans.” (Webinar Recording) Hanover Research, May 2020.
<https://www.clearslide.com/view/new/mail?iID=kXb9THM2k2c82KMLXxhW>

²⁷ Ibid.

²⁸ [1] Gibbs, L. et al. “Delayed Disaster Impacts on Academic Performance of Primary School Children.” *Child Development*, 90:4, July/August 2019. <https://srcd.onlinelibrary.wiley.com/doi/epdf/10.1111/cdev.13200> [2] Becker, R. “Wildfires Take a Toll on

learning loss after Hurricane Katrina found that it took two years for students to recover in terms of academic achievement.²⁹ This suggests that students will need long-term strategies for recovering learning lost during COVID-19 school closures. From the perspective of a high school district, multiple cohorts of entering students may continue to show the impact of learning loss in the future.

Individual learning plans can be used to access and plan for addressing different levels of learning during school closure. Some districts are planning to or in the process of creating individual learning plans as part of their COVID-19 academic recovery strategy. This strategy accounts for the potentially wide range of learning that individual students achieved at the end of the 2019-20 school year and allows schools to develop targeted supports for both academic and social-emotional needs.³⁰

OPPORTUNITIES FOR ADDITIONAL LEARNING TIME

Academic recovery strategies often rely on the use of additional instructional time to address learning loss. This additional time may come in the form of additional school days to the academic year, additional time in the school day, or extended summer school.³¹ For example, Maryland's draft school re-opening plan, [Maryland Together](#), offers several specific strategies for supporting academic learning during re-opening:³²

- **Summer or extended-year programs** for credit recovery or new course credit.
- **Enrichment classes** before or after school hours or during the summer that extend the curriculum and introduce new content.
- **Assistance programs** designed for students with special needs or students identified as being at-risk for academic failure.
- **Dual enrollment programs** for high school students.
- **Modified school day or year calendars** (e.g., early school year start date, late school year end date, before or after school extended time).

Additional learning time is most effective when student attendance is strong. Research from Advance Illinois on opportunities for increased learning time following school closures found that there is little research on the impact of additional time, especially at the scale necessary to make up for school closures due to COVID-19. However, research on extended learning outside of the context of disaster recovery highlights the importance of attendance in the efficacy of extended learning. As such, schools should consider the feasibility of ensuring high levels of participation in any extended learning opportunities offered to students.³³

Given the uncertainty around the format for instruction in both the summer and in the 2020-21 school year, if additional learning time is offered, districts should develop strategies and plans that ensure high levels of participation from students. Best practices for summer school programming offer several suggestions, listed below, for supporting strong attendance.

Students' Test Scores Years after the Smoke Clears." *The Verge*, January 2019.

<https://www.theverge.com/2019/1/24/18195267/wildfires-australia-california-children-survivors-school-learning>

²⁹ Harris, D.N. and M.F. Larsen. "The Effects of the New Orleans Post-Katrina Market-Based School Reports on Medium-Term Student Outcomes." Education Research Alliance for New Orleans, 2019.

<https://educationresearchalliancenola.org/files/publications/Harris-Larsen-Reform-Effects-2019-08-01.pdf>

³⁰ Hess, F. "Chiefs for Change COO Weighs in on Challenges of Coronavirus." EducationNext, April 10, 2020.

<https://www.educationnext.org/chiefs-for-change-coo-weighs-in-challenges-coronavirus-covid-19-rafal-baer/>

³¹ "From Crisis to Recovery: The Education Impact of COVID-19." Advance Illinois, April 2020, p. 29.





<https://www.advanceillinois.org/publications/from-crisis-to-recovery-the-education-impact-of-covid-19/>

³² Bullet points adapted from: "Maryland Together." Maryland State Department of Education, May 2020.

<http://marylandpublicschools.org/newsroom/Documents/MSDERecoveryPlan.pdf>

³³ "From Crisis to Recovery: The Education Impact of COVID-19," Op. cit., p. 29.

Strategies for Supporting Summer School Attendance

| | |
|---|---|
|  | Set enrollment deadlines to ensure that students participate in the entire session rather than entering mid-way. |
|  | Establish a clear attendance policy and track attendance. Ensure that students and families have a clear understanding of the attendance policy and reason for policy. |
|  | Provide incentives for students who attend. While field trips are common incentives to encourage attendance, there are other prizes or activities that can be distributed virtually. |
|  | Do not disguise academics in order to boost attendance. Camp-like programs have not been shown to have higher attendance than academic-focused programs. |

Source: RAND and The Wallace Foundation³⁴

³⁴ Figure text adapted with minor revisions from: Augustine, C.H., et. al. "Getting to Work on Summer Learning: Recommended Practices for Success." RAND Corporation and The Wallace Foundation, 2013. <https://www.wallacefoundation.org/knowledge-center/Documents/Getting-to-Work-on-Summer-Learning-Recommended-Practices-for-Success.pdf>

REPORT II: CLASSROOM PRACTICES FOR IMPROVING STUDENT OUTCOMES

INTRODUCTION

Research shows that by implementing evidence-based instructional practices, teachers can effectively improve the learning and achievement of students struggling in the general education classroom. To support districts in enabling teachers to best support students during class, Hanover synthesized empirical literature and meta-analyses on instructional strategies with the largest impact on student achievement. The strategies in this report can be used to support students in the general education classroom without extensive teacher pre-planning and include the following five evidence-based strategies:

- Actionable Feedback
- Non-Linguistic Representations
- Advance Organizers
- Cooperative Learning and Peer Tutoring
- Worked Examples

ACTIONABLE FEEDBACK

Providing actionable feedback is an essential classroom practice in which teachers communicate with students to enable them to understand their learning progress and change their learning strategies to improve outcomes.³⁵ While feedback helps students to determine their next steps in achieving the learning objective, it also helps to engage students in their learning, thus helping to improve outcomes.³⁶ Without feedback, students may fail to course-correct, thus not achieving to the level they could with feedback.³⁷ Notably, teachers should provide students with feedback throughout a lesson, rather than only on assessments.³⁸

Feedback can comprise answers to the following three questions, which both students and teachers can benefit from answering. Notably, these questions work together, rather than in isolation from one another, and answering one can lead to the next:³⁹

- “Where am I going?” (learning intentions/goals/ success criteria)
- “How am I doing?” (self-assessment and self-evaluation)
- “Where to next?” (progression, new goals)

Meta-analyses reveal significant positive effect sizes of providing quality feedback. In his seminal review of over 800 meta-analyses relating to student achievement, Hattie found that across meta-analyses, feedback has an overall effect size of 0.74; however, Hattie found that effect sizes varied across meta-analyses, indicating that some forms of feedback have a higher impact on student outcomes than others. Hattie’s results showed that while the types of feedback that have the highest impact on student achievement in the classroom “provide cues or reinforcement to the learner, are in the form of video, audio or computer-assisted feedback, or relate feedback to learning goals,” the forms of feedback with the least impact include programmed instruction, praise, punishment, and extrinsic rewards.⁴⁰

³⁵ Rainey, J. et al. “Classroom Instruction That Works, Second Edition.” McREL International, November 2010. p. 105. https://www.mcrel.org/wp-content/uploads/2016/03/McREL-research-report_Nov2010_Classroom-Instruction-that-Works_Second-Edition.pdf

³⁶ Vaughn, S. et al. “Intensive Interventions for Students Struggling in Reading and Mathematics.” Center on Instruction, 2012. pp. 18–19. <http://files.eric.ed.gov/fulltext/ED531907.pdf>

³⁷ Hattie, J. *Visible Learning for Teachers: Maximizing Impact on Learning*. Routledge, 2012. p. 174. https://apprendre.auf.org/wp-content/opera/13-BF-References-et-biblio-RPT-2014/Visible%20Learning_A%20synthesis%20or%20over%20800%20Meta-analyses%20Relating%20to%20Achievement_Hattie%20J%202009%20...pdf

³⁸ Vaughn et al., Op. cit., pp. 18–19.

³⁹ Bullet points quoted verbatim from: Hattie, Op. cit., p. 177.

⁴⁰ Ibid., p. 174.





In their update to Marzano’s seminal book, *Classroom Instruction that Works* (2001), Rainey et al. similarly found that all studies on the impact of feedback (including Marzano’s studies and more recent ones) produced positive effects for both oral and written feedback with an effect size of 0.76, indicating an average 28 percentile point gain. The study operationalized feedback “in written form as formative assessments and orally by the teacher or researcher.”⁴¹ Thus, research clearly demonstrates the critical importance of providing feedback in the classroom to improve student outcomes.

STRATEGIES FOR PROVIDING EFFECTIVE FEEDBACK

Effective feedback relates to a specific objective and is clear and precise. Thus, instead of providing general praise (e.g., “good job”), effective feedback connects to the learning goal and specific student actions and directly communicates to the student which components of the task they performed correctly or incorrectly or which parts of their answers are correct or incorrect.⁴² As such, “specificity is the key for students to determine what they did correctly and how they might better complete the task.”⁴³ Providing rewards, basic statements about incorrect responses, or praise do not show evidence of positively impacting student achievement, as they are not specific to the learning task and objective and fail to specify students’ next steps.⁴⁴ For example, within the classroom, teachers can practice providing effective qualitative feedback that enables students to interpret the appropriate next steps by observing student learning, intervening when students veer off course, challenging the student to course correct, and noting the student’s approach.⁴⁵

Additionally, the figure below lists additional research-based best practices for feedback that build on Marzano’s findings that effective feedback is corrective, timely, criterion-referenced, and that “students can effectively provide their own feedback.”⁴⁶

Characteristics of Feedback that Positively Impacts Student Outcomes

| | |
|---|--|
|  | Feedback should be instructive but not a substitute for instruction. Effective feedback is about faulty interpretations and hypotheses, not lack of information. After instruction, effective feedback includes both verification about correctness and the distance to criterion and elaboration on what to do next. Elaboration can be in the form of questions or prompts, such as “What’s this problem/task all about?”. |
|  | Feedback should be provided appropriately in time to meet student needs. When students are engrossed in figuring out a difficult task themselves, feedback should be delayed; but when students can use feedback to complete a task, immediacy helps. |
|  | Feedback should be referenced to the actual task (descriptive) and avoid being personal or evaluative. |
|  | Support students in self-selecting learning targets, self-monitoring progress, and self-assessment. |

Source: McREL International⁴⁷

Teachers can also use the following continuum of practices to improve on providing effective feedback.

⁴¹ Rainey et al., Op. cit., pp. 109–111.

⁴² Vaughn et al., Op. cit., pp. 20–21.

⁴³ Ibid.

⁴⁴ Hattie, Op. cit., p. 175.

⁴⁵ “High Impact Teaching Strategies: Excellence in Teaching and Learning.” State of Victoria Department of Education and Training, 2017. p. 25. <https://www.education.vic.gov.au/Documents/school/teachers/management/highimpactteachingstrat.pdf>

⁴⁶ Rainey et al., Op. cit., p. 111.

⁴⁷ Bullet points quoted verbatim from: Ibid.

Continuum of Effective Feedback Practice

| EMERGING | EVOLVING | EMBEDDING | EXCELLING |
|---|--|---|---|
| Teachers provide students with feedback on strengths and areas for improvement. | To progress learning, teachers provide students with targeted feedback based on informed and timely judgments of each student's achievement, relative to their learning goals and their needs. | All teachers use formative and summative assessment strategies, and provide students with timely feedback that supports individualized learning. Teachers use assessment data as a source of feedback on their teaching practice, implementing changes and interventions where and when required. | A range of comprehensive assessment data provides the basis for regular feedback to students and parents. Teachers strategically gather and analyze assessment data to reflect on their practice. Student feedback is actively used to inform teaching. |

Source: State of Victoria Department of Education and Training⁴⁸

Furthermore, in his review of meta-analyses, Hattie also studied the impact of classroom instructional practices that relate to feedback, including frequent testing, teaching test taking and coaching, questioning, and teacher immediacy. While these practices have a positive impact on student achievement, they have smaller effect sizes than feedback overall, ranging from 0.16 to 0.46. The following figure describes each of these practices and their effect size.

Additional Practices that Relate to Feedback

| PRACTICE | DESCRIPTION | EFFECT SIZE |
|--|--|-------------|
| Frequent testing | "Another form of feedback is repeated testing, but this is only effective if there is feedback from the tests to teachers such that they modify their instruction to attend to the strengths and gaps in student performance." | 0.34 |
| Teaching test taking and coaching | "The term "coaching" is used to refer to a wide range of test preparation activities carried out in order to improve test scores. Typically, coaching is instruction given or practice undertaken in preparation for taking a test." | 0.22 |
| Questioning | "Feedback can also come via teachers asking questions of their students, although it is an adage that teachers already know the answer to most of the questions they ask. The use of questions, especially higher-order questions, is often promulgated as a worthwhile teaching strategy." | 0.46 |
| Teacher immediacy | "The immediacy and closeness of responses to the students shows them that teachers are listening and responding....This immediacy is perceived by students as an acknowledgement of their engagement; it reduces the perceived distance between instructor and learners, is seen as rewarding to the student, and increases their level of enthusiasm or commitment to the learning task." | 0.16 |

Source: Hattie⁴⁹

NON-LINGUISTIC REPRESENTATIONS

Using non-linguistic representations to visually or concretely represent concepts can help struggling students learn content.⁵⁰ Nonlinguistic representations help students understand abstract concepts, organize content in a way that helps them understand it, and supports students in making connections between concepts and identifying patterns.⁵¹ Accordingly, "The way in which information is presented can impact knowledge construction, with visual or nonlinguistic representations mediating how students experience classroom

⁴⁸ Figure contents quoted verbatim from: "High Impact Teaching Strategies: Excellence in Teaching and Learning," Op. cit., p. 25.

⁴⁹ Figure contents quoted verbatim from: Hattie, Op. cit., pp. 178–183.

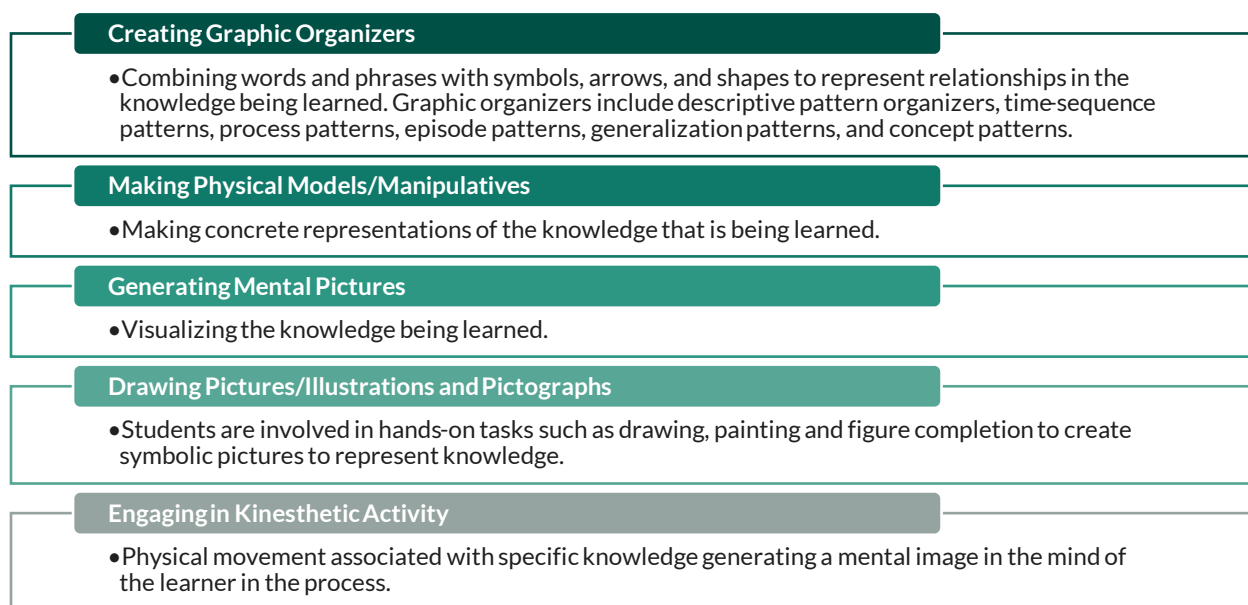
⁵⁰ Pashler, H. et al. "Organizing Instruction and Study to Improve Student Learning." U.S. Department of Education, Institute of Education Sciences, ERIC, 2007. p. 13. <https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/20072004.pdf>

⁵¹ Rainey et al., Op. cit., p. 73.

content.”⁵² The U.S. Department of Education’s Institute of Education Sciences (IES) recommends combining visual representations with verbal descriptions so that students can view “graphical presentations (e.g., graphs, figures) that illustrate key processes and concepts” while simultaneously hearing “verbal descriptions of those processes and concepts in order to facilitate student learning.”⁵³

Nonlinguistic representations are especially critical in subjects such as math and science to represent scientific phenomena and mathematical concepts. In these subjects, students benefit from developing a “representational competence” that enables them to use representations to solve a problem or support a claim.⁵⁴ While using visual and concrete representations of abstract concepts is essential in math and the sciences, it can also benefit students in other subjects. For example, in English and humanities classes, students who struggle to acquire new concepts and vocabulary words from reading and writing activities may learn more from visual and physical representations and experiences.⁵⁵ For example, “short documentary videos may help students learn new concepts and terms because they provide a vivid picture of how the object looks in the context of its environment or specialized use.”⁵⁶ Regardless of subject area, using nonlinguistic representation is especially important when teaching abstract concepts, during which students can benefit from the integration of concrete and abstract representations. As such, “Connecting different forms of representations helps students master the concept being taught and improves the likelihood that students will use it appropriately across a range of different contexts.”⁵⁷ There are many types of nonlinguistic representations, which range from drawing pictures and symbols, creating a mental picture, making a physical model, creating a graphic organizer or concept map, or engaging in physical activity to represent academic content.⁵⁸ The figure below describes common categories of evidence-based nonlinguistic representations.

Sample Evidence-Based Non-Linguistic Representations



Source: McREL International⁵⁹

⁵² Ibid., p. 72.

⁵³ Pashler et al., Op. cit., p. 13.

⁵⁴ Rainey et al., Op. cit., p. 73.

⁵⁵ Kamil, M.L. et al. “Improving Adolescent Literacy: Effective Classroom and Intervention Practices Improving Adolescent Literacy: Effective Classroom and Intervention Practices.” U.S. Department of Education, Institute of Education Sciences, 2008. p. 12. https://ies.ed.gov/ncee/www/Docs/PracticeGuide/adlit_pg_082608.pdf

⁵⁶ Ibid.

⁵⁷ Pashler et al., Op. cit., pp. 15–16.

⁵⁸ Rainey et al., Op. cit., p. 72.

⁵⁹ Figure contents quoted verbatim from: Ibid.

Hattie found that visual representations positively affect student achievement, noting that concept maps, i.e., “the development of graphical representations of the conceptual structure of the content to be learnt,” have a positive effect size of 0.57 and adjunct aids that “assist learning when they function to attract and direct attention, and highlight main ideas and comprehension” have a positive effect size of 0.37.⁶⁰ The IES also found that both “combining graphical presentations and verbal descriptions of key processes and concepts” and “connecting and interleaving both abstract and concrete representations of problems” have moderate levels of empirical evidence of improving student academic learning.⁶¹ Research shows that in math, and especially for students who struggle with math, using visuals, such as graphs or diagrams to represent math problems results in higher math outcomes.⁶² Similarly, in updating Marzano et al.’s seminal 2001 research, Rainey et al. found that the use of nonlinguistic representation strategies had a positive effect size across meta-analyses of 0.49. The researchers note that this effect size may be smaller than Marzano’s original effect size of 0.75 due to the use of a more conservative methodology.⁶³ In updating Marzano’s research, Rainey et al. identified the following impacts of nonlinguistic representations:⁶⁴

- Students exposed to nonlinguistic instructional strategies consistently performed better on academic assessments than those in control conditions
- The positive effects of nonlinguistic representations are consistent across tested subjects, grades, and student populations
- When pictures are used as nonlinguistic representations, animations appear to have an improved impact over static images
- Students show greater transfer of knowledge when they have organized information into a conceptual framework which allows them to see how the information connects in new situations
- Nonlinguistic representations incorporate a broad range of effective instructional strategies that may be employed within other strategies such as note-taking and summarizing

STRATEGIES FOR EFFECTIVELY USING NONLINGUISTIC REPRESENTATIONS

When using visual representations during instruction, teachers should strategically choose graphs, pictures, or other visuals that are relevant to the instructional content and processes and that enhance understanding rather than distracting students or detracting from the main point. As such, pictures do not need to be realistic to be effective, as realistic photos can distract students while schematic or abstract visuals may convey key points more clearly.⁶⁵ For example, a simpler, more abstract representation of the heart chambers may facilitate student understanding of the two loops of the human circulatory system better than a realistic photo or video of the heart.⁶⁶ Teachers should use a variety of nonlinguistic representations frequently and consistently, as “if you use these strategies only occasionally, it will limit students’ ability to grasp the possibilities associated with learning both linguistically and nonlinguistically, preventing them from developing automaticity in their use of all the representations.”⁶⁷ Finally, additional best practices for teacher use of nonlinguistic representations include providing verbal or text descriptions near the visual representation and explicitly pointing student attention to how the visual representation connects to the abstract concept “so that students understand that the same core idea is being expressed in multiple ways.”⁶⁸

⁶⁰ [1] Hattie, Op. cit., pp. 168–169, 207–208. [2] Gersten, R. et al. “Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics: A Synthesis of the Intervention Research.” *Center on Instruction*, 2008. p. 1. [3] Rainey et al., Op. cit., p. 80.

⁶¹ Pashler et al., Op. cit., pp. 13–16.

⁶² Gersten, Chard, Jayanthi, Baker, Morphy, et al., “Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics,” Op. cit., p. 1.

⁶³ Rainey et al., Op. cit., p. 80.

⁶⁴ Bullet points quoted verbatim from: Ibid., p. 81.

⁶⁵ Pashler et al., Op. cit., p. 14.

⁶⁶ Ibid.





⁶⁷ “Four Tips for Using Nonlinguistic Representations.” McREL International, September 2016. <https://www.mcrel.org/four-tips-for-using-nonlinguistic-representations/>

⁶⁸ Pashler et al., Op. cit., p. 14.

However, while combining verbal descriptions with visuals may help students to better grasp abstract concepts, some research indicates that students benefit more from creating and manipulating nonlinguistic representations themselves.⁶⁹ For example, in math, teachers should encourage students to represent the same problem in different forms, such as the original word problem, a diagram, equations, and a graph to help them grasp the concept and ensure they recognize, understand, and can solve the concept in all forms.⁷⁰

The following figure presents best practices for encouraging students to represent concepts nonlinguistically.

Best Practices for Student Use of Nonlinguistic Representations

| | |
|---|---|
|  | Teach students to use and combine multiple forms of nonlinguistic representations to represent learning. Representing a new concept through multiple nonlinguistic representations increases deeper learning and concept retention. |
|  | Ensure that students' nonlinguistic representations include key content about the concept taught. Nonlinguistic representations must include and focus on critical pieces of content to positively impact student learning. |
|  | Encourage students to explain their choice and use of nonlinguistic representation(s) and engage in conversations about them with their classmates. Explaining their decision-making process for why they chose a certain nonlinguistic representation and how it represents the content improves student understanding of content, extends and applies their learning, helps them make connections, and can reveal any gaps or mistakes in understanding. |
|  | Promote students' abilities to create nonlinguistic representations on their own to improve understanding. Student learning increases from using nonlinguistic representations to represent new information in multiple ways, and thus students benefit from having the ability to create nonlinguistic representations as a learning and study strategy without teacher assignment. |

Source: Marzano and McREL International⁷¹

Furthermore, **nonlinguistic representations can also help students develop self-regulation skills.** For example, teachers can employ the following best practices to use graphic organizers to teach new content:⁷²

- Develop students' background knowledge, such as introducing the vocabulary necessary for understanding the text
- Discuss the importance of the graphic organizer strategy and how it will help increase what students remember
- Model how to use the graphic organizer and include self-instruction techniques so that students can talk themselves through the task
- Help students memorize the steps for completing the graphic organizer and monitoring their completion progress
- Support students as they practice using the graphic organizer while applying the self-instruction and self-monitoring techniques
- Allow students to use the graphic organizer and self-regulation strategies independently

⁶⁹ Rainey et al., Op. cit., p. 72.

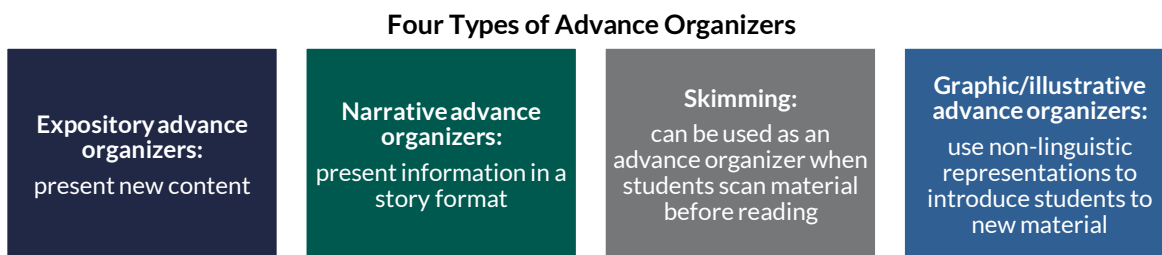
⁷⁰ Star, J.R. et al. "Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students." U.S. Department of Education, Institute of Education Sciences, January 2019. pp. 22–23.
https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/wwc_algebra_040715.pdf

⁷¹ [1] "Four Tips for Using Nonlinguistic Representations," Op. cit. [2] Marzano, R. "The Art and Science of Teaching / Representing Knowledge Nonlinguistically." *Educational Leadership*, May 2010. <http://www.ascd.org/publications/educational-leadership/may10/vol67/num08/Representing-Knowledge-Nonlinguistically.aspx>

⁷² Bullet points quoted from: Vaughn et al., Op. cit., pp. 17–18.

ADVANCE ORGANIZERS

Advance organizers offer students a preview of new content in order to bridge previous knowledge with content to be learned. Advance organizers benefit students by guiding them “from the known to the unknown by activating and, as appropriate, re-creating a cognitive framework of familiar concepts in which to incorporate new information.”⁷³ They thus help students build on their background knowledge to make learning new content easier. Advance organizers also enable teachers to best support student learning by helping teachers understand and take advantage of students’ prior knowledge in relation to the current lesson.⁷⁴ The following figure presents four common types of advance organizers.



Source: McREL International⁷⁵

Research shows that using advanced organizers benefits student achievement.⁷⁶ Hattie’s review of meta-analyses revealed that advanced organizers have a positive impact on student achievement with an effect size of 0.41.⁷⁷ Similarly, Rainey et al. found that using advanced organizers has an overall large positive effect size of 0.74, with all reviewed studies showing positive effects.⁷⁸

STRATEGIES FOR EFFECTIVELY USING ADVANCE ORGANIZERS

Effective advance organizers help students organize and interpret new content by relating it to prior knowledge.⁷⁹ Teachers should provide advance organizers prior to the lesson and use the organizer to “draw attention to important points, identify relationships within the material, and relate material to students’ prior knowledge.”⁸⁰ Additional features of effective advance organizers include that they should provide an organizational structure for the new material, articulate the learning objectives of the lesson, share success measures, and provide content that is more inclusive and abstract than the lesson content.⁸¹ Teachers can also use the advance organizer to provide an organized conceptual framework that helps students connect new instructional content to the framework.⁸²

Notably, research shows that advance organizers that only touch on surface-level learning without including deep learning and those that are used in lesson plans for teacher use rather than student use are less effective at supporting students.⁸³

⁷³ Rainey et al., Op. cit., p. 130.

⁷⁴ Ibid., pp. 130–131.

⁷⁵ Figure contents quoted verbatim from: Ibid., p. 131.

⁷⁶ [1] Hattie, Op. cit., pp. 167–168. [2] Rainey et al., Op. cit., p. 135.

⁷⁷ Hattie, Op. cit., pp. 167–168.

⁷⁸ Rainey et al., Op. cit., p. 135.

⁷⁹ Hattie, Op. cit., pp. 167–168.

⁸⁰ Rainey et al., Op. cit., p. 131.

⁸¹ Hattie, Op. cit., pp. 167–168.

⁸² Rainey et al., Op. cit., p. 131.

⁸³ Hattie, Op. cit., pp. 167–168.

COOPERATIVE LEARNING AND PEER TUTORING

COOPERATIVE LEARNING

Cooperative learning is when students work together in mixed-ability groups of about four to five students.⁸⁴ Within these small groups, students help one another to learn content and apply metacognitive strategies.⁸⁵ Students work together under conditions that “are established to assuage the negative aspects of group behavior while maintaining the benefits.”⁸⁶

For example, in math, experts recommend using cooperative learning strategies to assist students with thinking through algebra problems using reflective questioning.⁸⁷ In these small groups, students work together to review and solve problems or practice certain math skills. Accordingly, “discussing and solving problems as a group can help students to move from a concrete level of understanding to a more abstract level of understanding.”⁸⁸

Evidence on the effectiveness of cooperative learning indicates it is an effective strategy for improving student outcomes overall and in both ELA and mathematics courses.⁸⁹ In their update to Marzano’s *Classroom Instruction that Works* (2001), Rainey et al. reported a statistically significant positive effect size of 0.44 across 20 studies. While this finding supported Marzano’s original finding on the positive impact of cooperative learning, the researchers note their effect size may be smaller than Marzano’s original effect size of 0.76 as a “result of more conservative methodology.”⁹⁰ Hattie found that small group learning had an effect size of 0.49.⁹¹

Additionally, comprehensive reviews of secondary math and reading programs by the Best Evidence Encyclopedia (BEE) at John Hopkins University found that cooperative learning shows strong evidence for having a positive impact on student outcomes across both subjects. Specifically, the review of middle and high school math programs found that cooperative learning had the strongest evidence of instructional effectiveness across instructional and intervention programs. The review identified 22 rigorous studies of cooperative learning programs for secondary math, with an average effect size of 0.29, with some cooperative learning programs showing effect sizes of 0.48.⁹² Similarly, the review of secondary reading programs found cooperative learning “to be among the most effective strategies for improving adolescent literacy” with positive results across six studies yielding an average positive effect size of 0.1.⁹³ The researchers note that cooperative learning can improve reading comprehension by:⁹⁴

- Increasing motivation through engagement with peers and encouragement from them
- Increasing learning by explaining to peers and receiving explanations from them
- Increasing personalization through individualized feedback from peers and teachers
- Providing opportunities for participation in high-quality discussions of text that support and increase comprehension

⁸⁴ [1] Baye, A. et al. “A Synthesis of Quantitative Research on Reading Programs for Secondary Students.” Best Evidence Encyclopedia, Johns Hopkins University, January 2018. pp. 14–15. <http://www.bestevidence.org/word/Secondary-Reading-01-31-18.pdf> [2] “High-Quality Mathematics Instruction: Cooperative Learning.” The Iris Center at Vanderbilt University. <https://iris.peabody.vanderbilt.edu/module/math/cresource/q3/p08/#content>

⁸⁵ Baye et al., Op. cit., pp. 14–15.

⁸⁶ Rainey et al., Op. cit., p. 84.

⁸⁷ Star et al., “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students,” Op. cit., p. 24.

⁸⁸ “High-Quality Mathematics Instruction: Cooperative Learning,” Op. cit.

⁸⁹ [1] Rainey et al., Op. cit., p. 99. [2] Slavin, R., C. Lake, and C. Groff. “Effective Programs in Middle and High School Mathematics: A Best Evidence Synthesis.” Best Evidence Encyclopedia, Johns Hopkins University, March 11, 2009. p. 2. http://www.bestevidence.org/word/mhs_math_Mar_11_2009_sum.pdf [3] Baye et al., Op. cit., pp. 14–15.

⁹⁰ Rainey et al., Op. cit., p. 99.

⁹¹ Hattie, Op. cit., p. 74.

⁹² Slavin, Lake, and Groff, Op. cit., p. 2.

⁹³ Baye et al., Op. cit., pp. 14–15, 22.

⁹⁴ Bullet points adapted from: Ibid., pp. 14–15.

FEATURES OF EFFECTIVE COOPERATIVE LEARNING

When implementing effective cooperative learning, teachers should establish mixed-ability groups and strive to create a balance between interdependence and independent accountability. Essentially, regardless of whether students within a group are cooperative or competitive, they should recognize that their outcomes are somewhat dependent on the actions and outcomes of other group members and that each group member must contribute their share.⁹⁵ Ideally, this structure promotes cooperation and enhances learning. The figure below describes the concepts of positive interdependence, individual accountability, and others, that contribute to effective cooperative learning.

Features of Effective Cooperative Learning

| FEATURE | PURPOSE | INSTRUCTIONAL IMPLICATION |
|------------------------------------|--|--|
| Positive Interdependence | Ensure that success on the part of one promotes success among others within the group. | Establish a cooperative goal structure & equally distribute resources. |
| Individual Accountability | Ensure that all members contribute to achievement of the goal. | Establish optimal group size & include individual assessments. |
| Promotive Interaction | Uncover cognitive disequilibrium for the development of robust & tenable schema. | Encourage discussion among group members. |
| Instruction in Group Skills | Ensure that all members understand effective group skills. | Provide initial and ongoing instruction on effective group skills. |
| Group Processing | Promote group and individual metacognition for maintenance of group efficacy. | Establish dedicated time for group reflection. |

Source: McREL International⁹⁶

Additionally, the following figure highlights activities for facilitating cooperative learning among secondary math students. While these examples gear towards math, teachers can also apply them to other subjects.

Examples of Cooperative Learning Strategies

| STRATEGY | DESCRIPTION |
|---|---|
| Think, write, pair, share | Give students time to think independently about the problem and write their ideas before sharing with their partners and then with the entire group. As a whole group, identify the reflective questions that students naturally used to help their own thinking and to help their partners. |
| Confident, shaky, relearn | Students can ask themselves what aspects of a task they feel confident about, what aspects they feel shaky about, and what aspects they need to relearn. When a student feels confident about a task, he or she can explain the task and validity of the solution strategy to himself or herself and to others. |
| Partner coaching/Quiz, quiz, trade | Students quiz each other on assigned problems or tasks. While partnered, one student solves a problem, and the other student provides feedback on the solution and solution strategy. Then students can switch roles. |
| Directions for a friend | Rather than asking students to solve a problem, ask them to write down the directions for how to solve it. For example, provide the following instructions to students: "Say your friend emails you for help with problem 7 on the assignment. How would you describe how to solve the problem to him or her? What would you write?" Then, have students trade directions with a partner, and have each student try to solve the problem according to the partner's directions. |

⁹⁵ Rainey et al., Op. cit., p. 85.

⁹⁶ Figure contents quoted verbatim from: Ibid., pp. 86–87.

| STRATEGY | DESCRIPTION |
|--------------------------------|---|
| Jigsaw | Arrange students in groups and give each group member a different problem. For example, in each “jigsaw” group, student 1 is given information on problem A, student 2 is given information on problem B, and student 3 is given information on problem C. Then group members collaborate with members from other groups who were assigned the same problem to discuss their ideas and strategies. Finally, students come back to their jigsaw groups to discuss the ideas and strategies they heard from students in the other groups. |
| Numbered heads together | Assign students to groups and give each student a number. Ask the class a question and encourage students to “put their heads together” to answer the question. Call out a number and have the student who was assigned that number act as the spokesperson for the group and explain the group’s answer. Because students do not know what number will be called, group members must work together to find the answer and all group members must be prepared to answer the question. |

Source: U.S. Department of Education⁹⁷

PEER TUTORING

In peer tutoring (also referred to as peer-mediated instruction) students work together in pairs or small groups to work on problems or complete an assignment.⁹⁸ In the pair, one student at a time acts as the tutor, and the roles may or may not switch. Students can have the same or different ability levels.⁹⁹ Notably, teachers should use peer tutoring to practice and reinforce skills, rather than teach new skills. Accordingly, peer tutoring “provides students opportunities to practice a newly learned skill or to review mathematics skills while receiving feedback.”¹⁰⁰

Students benefit from both the tutor and tutee roles, with research supporting both academic and social benefits of peer tutoring, including self-regulation of student learning.¹⁰¹ Hattie’s review of meta-analyses found that peer tutoring had a significant positive effect size of 0.55, noting that “the overall effects of the use of peers as co-teachers (of themselves and of others) in classes is, overall, quite powerful.”¹⁰² Additionally, Hattie found a larger effect when students have some autonomy over their teaching within tutor pairs.¹⁰³

STRATEGIES FOR IMPLEMENTING PEER TUTORING

Two common peer-tutoring approaches include Class-Wide Peer Tutoring (CWPT) and Peer Assisted Learning Strategies (PALS). These approaches share the following features:¹⁰⁴

- Reciprocal peer tutoring (i.e., during the session, each student in the pair serves as a coach and as a tutee)
- Frequent verbal interaction and feedback between the coach and tutee
- Use of positive reinforcement
- A competitive game format
- Teacher monitoring and feedback

In CWPT, the teacher trains all students to use tutoring behaviors, and then develops tutoring materials for students to use in pairs. Students take turns as the tutor and tutee, with the more advanced student acting as

⁹⁷ Figure contents quoted verbatim with modification from: Star et al., “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students,” Op. cit., p. 25.

⁹⁸ Wexler, J. et al. “A Synthesis of Peer-Mediated Academic Interventions for Secondary Struggling Learners.” *Journal of Learning Disabilities*, 48:5, September 1, 2015. p. 452. Accessed via EbscoHost.

⁹⁹ “High-Quality Mathematics Instruction: Peer Tutoring.” The Iris Center at Vanderbilt University. <https://iris.peabody.vanderbilt.edu/module/math/cresource/q3/p07/#content>

¹⁰⁰ Ibid.

¹⁰¹ Hattie, Op. cit., pp. 186–187.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Bullet points quoted verbatim with modification from: “High-Quality Mathematics Instruction: Peer Tutoring,” Op. cit.

the tutor first.¹⁰⁵ Teacher-developed materials provide scaffolding for students as they act as the tutor. The following figure highlights one method for implementing CWPT.

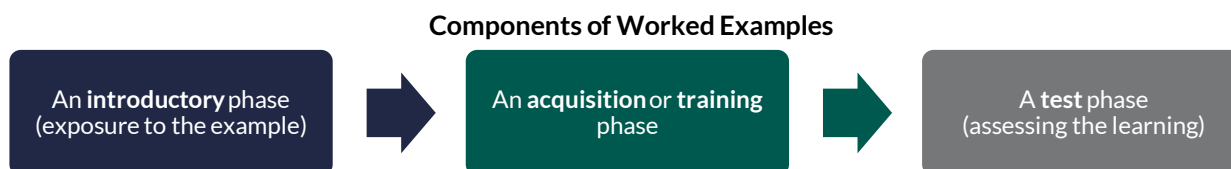
Sample CWPT Implementation Approach

| GETTING READY | CLASS TIME RECOMMENDATIONS | POINT SYSTEM IMPLEMENTATION |
|---|---|--|
| <ul style="list-style-type: none"> ▪ Train students in the use of CWPT: <ul style="list-style-type: none"> ○ Peer-tutoring social skills. ○ Transition from regular seating to tutoring pairs. ○ Retrieval and return of tutoring materials. ○ Teacher modeling of tutor/tutee partnership. ○ Error correction procedures. ○ Provide teacher feedback. ▪ Divide class into two teams. ▪ Determine tutoring pairs within each team. ▪ Paired students should have similar learning characteristics. | <ul style="list-style-type: none"> ▪ Student 1 of pair is tutor (10-12 minutes). ▪ Student 2 of pair is tutor (10-12 minutes). ▪ Point recording (5-6 minutes). ▪ Thirty-minutes sessions two to four times per week. | <ul style="list-style-type: none"> ▪ Teacher assigns points to individual students for: <ul style="list-style-type: none"> ○ Correct responses. ○ Tutoring behaviors (i.e., cooperative work habits, accurate point recording, following directions). ▪ Tutor assigns points to tutee for: <ul style="list-style-type: none"> ○ Correct responses. ○ Error corrections. ▪ Teacher posts team points. ▪ Reward team with the most points at the end of the week (i.e., Team of the Week Award). |

Source: *Intervention in School and Clinic*¹⁰⁶

WORKED EXAMPLES

Experts recommend using worked examples (also referred to as solved problems) and problem-solving exercises to assist struggling secondary students.¹⁰⁷ Worked examples show the problem statement and the steps to solve the problem and find the solution.¹⁰⁸ Typically implemented in math and science classes, worked examples help to lessen the cognitive load of solving the problem so students can better focus on the process of finding the correct answer (rather than the answer itself).¹⁰⁹ Worked examples typically include three parts, shown in the figure below.



Source: Hattie¹¹⁰

The IES recommends that teachers “alternat[e] between worked examples demonstrating one possible solution path and problems that the student is asked to solve for himself or herself.”¹¹¹ For example, algebraic reasoning “requires students to process multiple pieces of complex information simultaneously, which can limit students’ capacity to develop new knowledge” and imposes a high cognitive load.¹¹² Thus, using solved problems facilitates students’ abstract reasoning “by allowing students to see the problem and many solution

¹⁰⁵ Impecoven-Lind, L.S. and A. Foegen. “Teaching Algebra to Students with Learning Disabilities.” *Intervention in School and Clinic*, 46:1, 2010. p. 34. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.827.1802&rep=rep1&type=pdf>

¹⁰⁶ Figure contents quoted verbatim with modification from: Ibid.

¹⁰⁷ [1] Pashler et al., Op. cit., pp. 9–10. [2] Star et al., Op. cit., p. 4. [3] Hattie, Op. cit., p. 172. [4] Gersten et al., Op. cit., p. 2.

¹⁰⁸ [1] Hattie, Op. cit., p. 172. [2] Star et al., “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students,” Op. cit., p. 4.

¹⁰⁹ [1] Pashler et al., Op. cit., pp. 9–10. [2] Star et al., Op. cit., p. 4. [3] Hattie, Op. cit., p. 172.

¹¹⁰ Figure contents quoted verbatim from: Hattie, Op. cit., p. 172.

¹¹¹ Pashler et al., Op. cit., pp. 9–10.

¹¹² Star et al., “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students,” Op. cit., p. 4.

steps at once—without executing each step—helping students learn more efficiently.”¹¹³ Analyzing and discussing solved problems can also improve the critical thinking skills of struggling students.¹¹⁴ The following figure provides an example of a worked example in algebra.

Sample Worked Example

| | |
|--|--|
| Solve for x in this equation: $3^{4x+3} = 81$ | $3^{4x+3} = 81$ $3^{4x+3} = 3^4$ $4x+3 = 4$ $4x = 1$ $x = \frac{1}{4}$ |
|--|--|

Source: U.S. Department of Education¹¹⁵



Multiple studies and meta-analyses indicate that using worked examples positively impacts student learning in the classroom.¹¹⁶ Hattie’s review found that integrating worked examples has a positive effect size of 0.52-0.57 and benefited students by reducing the cognitive load.¹¹⁷ Furthermore, the IES states that “Numerous laboratory experiments provide support for the benefits of interleaving worked example solutions and problem-solving exercises.”¹¹⁸ Specifically, two IES practice guides include using worked problems as a recommendation. While one finds worked problems as having moderate evidence for improving student learning overall based on numerous experimental studies, another found that using worked problems in algebra instruction as having minimal evidence based on three high-quality studies showing positive effects.¹¹⁹

STRATEGIES FOR EFFECTIVELY USING WORKED EXAMPLES

Teachers can select worked examples from textbooks and curricular materials, student work (e.g., past work on homework, projects, and assessments), previous year’s work, and other teachers.¹²⁰ Teachers should choose worked examples that connect to learning objectives, demonstrate the lesson’s instructional aim, and include some common errors.¹²¹

When providing students with a worked example, teachers should have students analyze and discuss the worked example’s structure and solution to identify and compare the strategies.¹²² Teachers can prompt students to describe the steps used to solve the solved problem and explain their reasoning. The IES recommends that teachers “Ask students specific questions about the solution strategy, and whether that strategy is logical and mathematically correct.”¹²³ The figure below highlights sample questions that can facilitate discussion about solved problems and increase student engagement. Notably, teachers should vary the questions based on the problem type and student needs, and can prompt students with the questions verbally or in writing.¹²⁴

Sample Solved Problems Discussion Questions

| | | | |
|---|--|---|--|
|  | What were the steps involved in solving the problem? Why do they work in this order? Would they work in a different order? |  | What are other problems for which this strategy will work? |
|---|--|---|--|

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Figure contents quoted verbatim from : Ibid.

¹¹⁶ [1] Hattie, Op. cit., p. 172. [2] Gersten et al., Op. cit., p. 2. [3] Pashler et al., Op. cit., pp. 9–10.

¹¹⁷ Hattie, Op. cit., p. 172.

¹¹⁸ Pashler et al., Op. cit., pp. 9–10.

¹¹⁹ [1] Ibid. [2] Star et al., “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students,” Op. cit., p. 4.

¹²⁰ Star et al., “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students,” Op. cit., p. 15.

¹²¹ Ibid., p. 6.

¹²² Ibid., p. 5.

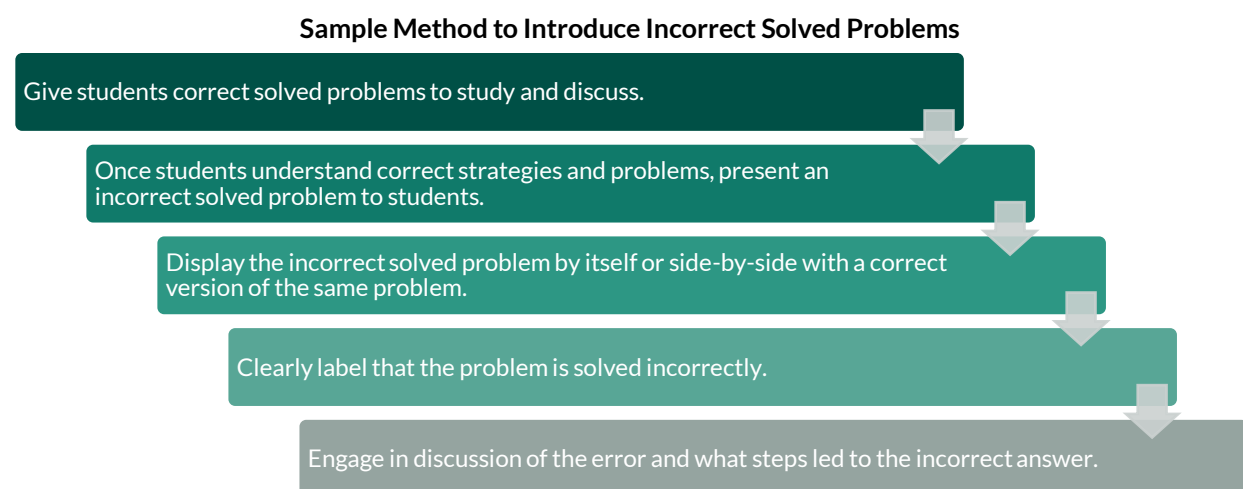
¹²³ Ibid.

¹²⁴ Ibid.

| | | | |
|---|--|---|---|
| ? | Could the problem have been solved with fewer steps? | ? | How can you change the given problem so that this strategy does not work? |
| ? | Can anyone think of a different way to solve this problem? | ? | How can you modify the solution to make it clearer to others? |
| ? | Will this strategy always work? Why? | ? | What other mathematical ideas connect to this solution? |

Source: U.S. Department of Education¹²⁵

In addition to providing struggling students with correct worked examples, teachers can give students incorrect worked examples to review and analyze. The IES recommends that after providing students with correct solved problems, teachers can “use incorrectly solved problems to help students deepen their understanding of concepts and correct solution strategies by analyzing strategic, reasoning, and procedural errors.”¹²⁶ The IES notes that “when analyzing an incorrect solved problem, students should explain why identified errors led to an incorrect answer so they can better understand the correct processes and strategies.”¹²⁷ When comparing a correct and incorrect worked example, students should compare the strategies used in each.¹²⁸ The following figure highlights one method for introducing incorrect worked examples to students.



Source: U.S. Department of Education¹²⁹

Discussing why incorrect worked examples are incorrect can help students better understand how to find the correct solution.¹³⁰ In fact, some research shows that struggling students can benefit more from incorrectly worked examples than correctly worked examples. For example, a 2016 study evaluated the impact of incorrect examples on algebra learning. Participants included 140 middle school students from five algebra classrooms, and the researchers randomly assigned students within classrooms to work on worksheets with incorrect examples, correct examples, or the control worksheet.¹³¹ Results showed that students with low prior algebra knowledge benefitted more from working on incorrect examples than on correct examples, while students with high prior algebra knowledge benefited from working on all problem types.¹³²

¹²⁵ Figure contents quoted verbatim with modification from: Ibid.

¹²⁶ Ibid., p. 8.

¹²⁷ Ibid., p. 10.

¹²⁸ Ibid.

¹²⁹ Figure contents quoted verbatim with modification from: Ibid., p. 9.

¹³⁰ Ibid., p. 8.

¹³¹ Barbieri, C. and J.L. Booth. “Support for Struggling Students in Algebra: Contributions of Incorrect Worked Examples.” *Learning and Individual Differences*, 48, 2016. p. 38. Accessed via EbscoHost.

¹³² Ibid., p. 41.

REPORT III: INFO-BRIEF: LEARNING LOSS THROUGH TRAUMATIC EVENTS

INTRODUCTION

Most U.S. schools remain closed in an attempt to limit the spread of COVID-19,¹³³ causing districts to ask how the pandemic will affect students socially, emotionally, and academically. The literature on childhood trauma can offer useful insights to districts, because, as a public health crisis, COVID-19 itself represents a distressing incident.¹³⁴ Such research also holds relevance, however, because how students react to COVID-19 will depend on whether they previously have experienced—or currently are experiencing—other types of trauma, in the form of either short-term acute traumatic events or long-term chronic traumatic situations.¹³⁵ In fact, with evidence suggesting that as many as two-thirds of children have suffered at least one traumatic event by age 16¹³⁶ and more than half of families have lived through a disaster,¹³⁷ examining the potential effects of COVID-19 through the lens of childhood trauma seems essential.

Importantly, the literature provides findings pertaining to the effects of trauma more generally and does not address COVID-19 specifically—a logical caveat given the unprecedented and ongoing nature of the pandemic. Efforts to understand COVID-19's impact remain further complicated by continued uncertainty regarding the pandemic's severity and duration, with the crisis resembling an acute traumatic event initially and perhaps evolving into a chronic traumatic situation (especially for families who encounter financial insecurity and/or homelessness due to unemployment).

HOW DISTRICTS MITIGATE THE EFFECTS OF TRAUMA

As districts consider how to support students in the midst of a traumatic event such as COVID-19, Maslow's hierarchy of needs may provide a useful starting point.¹³⁸ According to Maslow, individuals prioritize meeting basic needs—such as obtaining food, clothing, and shelter and ensuring safety and security—first. Notably, Maslow's conceptualization of security extends beyond *physical* protection to encompass aspects of social, emotional, and financial stability as well. Having met fundamental needs, individuals then seek emotional and psychological fulfillment, by forming relationships, earning others' respect, and building self-esteem. Individuals who reach the pinnacle of personal growth, self-actualization, realize their full potential and live with purpose and meaning.¹³⁹

¹³³ "Map: Coronavirus and School Closures." *Education Week*. <https://www.edweek.org/ew/section/multimedia/map-coronavirus-and-school-closures.html>

¹³⁴ "Disasters." The National Child Traumatic Stress Network. <https://www.nctsn.org/what-is-child-trauma/trauma-types/disasters>

¹³⁵ "About Child Trauma." The National Child Traumatic Stress Network. <https://www.nctsn.org/what-is-child-trauma/about-child-trauma>

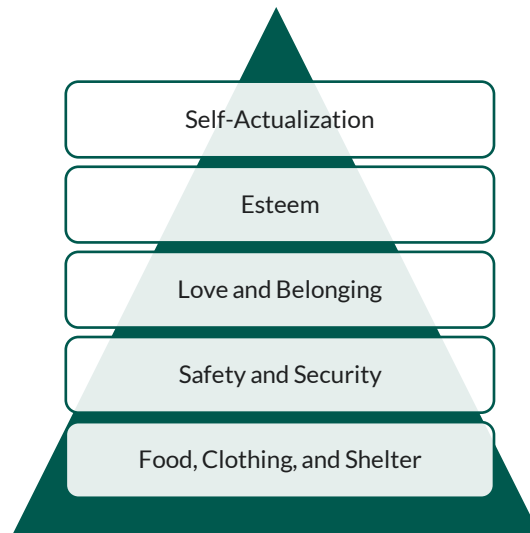
¹³⁶ Copeland, W.E., G. Keeler, A. Angold, and E.J. Costello. "Traumatic Events and Posttraumatic Stress in Childhood." *Archives of General Psychiatry*, 64:5, 2007. https://www.researchgate.net/publication/6345030_Traumatic_Events_and_Posttraumatic_Stress_in_Childhood

¹³⁷ "What Are You Waiting For? 2014 National Report Card on Protecting Children in Disasters." Save the Children, 2014. <https://www.savethechildren.org/content/dam/usa/reports/emergency-prep/disaster-report-2014.pdf>

¹³⁸ [1] Block, M. "Maslow's Hierarchy of Needs." In Goldstein, S. and J.A. Naglieri (eds.). *Encyclopedia of Child Behavior and Development*. Springer: Boston, 2011. [2] Villarica, H. "Maslow 2.0: A New and Improved Recipe for Happiness." *The Atlantic*, August 17, 2011. <https://www.theatlantic.com/health/archive/2011/08/maslow-20-a-new-and-improved-recipe-for-happiness/243486/#.TkKIRv8USE.facebook> [3] McLeod, S. "Maslow's Hierarchy of Needs." *Simply Psychology*, March 20, 2020. <https://www.simplypsychology.org/maslow.html>

¹³⁹ Ibid.

Maslow's Hierarchy of Needs



Source: Block¹⁴⁰

Given that traumatic events often erode students' sense of well-being in multiple key respects, frameworks intended to guide trauma-informed practices in districts understandably build upon Maslow's hierarchy.¹⁴¹ Predictable routines, for example, create stability, helping students feel safe. Strong, supportive relationships not only offer concerned students an added layer of protection, but also tend to their emotional and psychological needs.

Guiding Principles of Trauma-Informed Practices

| | |
|--|---|
| | Create predictable routines. |
| | Build strong & supportive relationships. |
| | Empower students' agency. |
| | Support the development of self-regulation skills. |
| | Provide opportunities to explore individual & community identities. |

Source: Transforming Education¹⁴²

Successful implementation of a trauma-informed approach requires a comprehensive set of strategies and the involvement of stakeholders across the school community. Trauma-informed schools typically **realize** "the widespread impact of trauma and pathways to recovery," **recognize** the signs and symptoms of trauma, **respond** "by integrating knowledge [of] trauma into all facets of the system," and **resist** "re-traumatization" by minimizing "unnecessary triggers."¹⁴³ The following figure outlines the areas trauma-informed schools

¹⁴⁰ Figure adapted from: Block, Op. cit.

¹⁴¹ "Trauma-Informed SEL Toolkit." Transforming Education, January 28, 2020. <https://www.transformingeducation.org/trauma-informed-sel-toolkit/>

¹⁴² Figure reproduced nearly verbatim from: Ibid.

¹⁴³ "Creating, Supporting, and Sustaining Trauma-Informed Schools: A System Framework." The National Child Traumatic Stress Network, 2017.

typically prioritize, however, please refer to the frameworks developed by the [National Child Traumatic Stress Network](#) and the [Wisconsin Department of Public Instruction](#) for more detailed descriptions of individual features. Because such approaches generally evolved to support students in the school setting, however, districts may need to adapt certain strategies and/or incorporate new techniques to suit the distance learning necessitated by COVID-19.

Strategies for Trauma-Informed Schools

| STRATEGIES | DESCRIPTIONS |
|---------------------------------|---|
| Raising Awareness | Foster an understanding of childhood trauma, including the causes, symptoms, and potential effects on social-emotional and academic outcomes. |
| Identifying Needs | Create mechanisms for identifying students currently experiencing, or at risk of experiencing, trauma. Learn, if possible, the histories of any past traumas students and families suffered. Determine appropriate supports. |
| Ensuring Safety | Ensure all students feel physically, socially, and emotionally safe. Create calming, welcoming learning environments. Avoid stimuli (e.g., lights, colors, sounds) that trigger students. Provide reassurances. Use de-escalation techniques. |
| Creating Consistency | Establish a sense of constancy and predictability by creating schedules and routines and communicating clear sets of rules and expectations. |
| Building Relationships | Foster positive, healthy relationships among students, as well as between students and teachers. Create connections and establish trust. Check in regularly. |
| Teaching Self-Regulation | Cultivate skills that enable students to avoid becoming hypervigilant in stressful situations (i.e., preventing a fight, flight, or freeze response). Build resilience. |
| Engaging Families | Help families assist students at home with effective stress management strategies. Encourage families to seek additional supports as needed, understanding that parents also may exhibit signs of trauma. Respect cultural differences. |
| Forming Partnerships | Collaborate with community-based organizations and providers to connect students and families with necessary services and supports. |

Sources: Multiple¹⁴⁴

In recent weeks, key organizations focused on children’s mental health and social-emotional well-being created various resources to support students during COVID-19-related school closures. The contents reflect best practices learned while addressing the effects of other forms of childhood trauma. For example, during the crisis, the [National Child Traumatic Stress Network](#) advises adults to:¹⁴⁵

- Limit children’s media exposure
- Correct inaccurate information
- Start a conversation with children
- Encourage children to ask questions and answer them directly
- Provide reassurance
- Re-establish a routine
- Validate children’s emotions
- Understand common responses to stress
- Help children self-regulate

https://www.nctsn.org/sites/default/files/resources/creating_supporting_sustaining_trauma_informed_schools_a_systems_framework.pdf

¹⁴⁴ [1] Cole, S.F. et al. “Helping Traumatized Children Learn: Supportive School Environments for Children Traumatized by Family Violence, Vol. 2.” Massachusetts Advocates for Children, Harvard Law School, and Task Force on Children Affected by Domestic Violence. 2013. <https://traumasensitiveschools.org/tlpi-publications/download-a-free-copy-of-a-guide-to-creating-trauma-sensitive-schools/> [2] Craig, S.E. “The Trauma-Sensitive Teacher.” *Educational Leadership*, September 2016. http://www.ascd.org/publications/educational_leadership/sept16/vol74/num01/The_Trauma-Sensitive_Teacher.aspx [3] “Creating, Supporting, and Sustaining Trauma-Informed Schools: A System Framework,” Op. cit. [4] “Strategies and Resources to Create a Trauma-Sensitive School.” Wisconsin Department of Public Instruction. <https://dpi.wi.gov/sites/default/files/imce/sspw/pdf/traumastrategies.pdf> [5] McInerney and McKlindon, Op. cit. [6] Downey, Op. cit.

¹⁴⁵ Bulleted text adapted from: “Supporting Children During Coronavirus (COVID19).” National Child Traumatic Stress Network, 2020. <https://www.nctsn.org/sites/default/files/resources/fact-sheet/supportingchildren-covid-factsheet.pdf>

- Help children stay connected
- Acknowledge missed milestones (e.g., graduation)
- Be a positive role model
- Practice self-care
- Seek extra support and service

Additional Resources

Child Mind Institute: [Supporting Kids During the Coronavirus Crisis](#)

Child Mind Institute: [Supporting Teenagers and Young Adults During the Coronavirus Crisis](#)







Child Trends: [Resources for Supporting Children's Emotional Well-being During the COVID-19 Pandemic](#)

NASP: [Helping Children Cope with Changes Resulting From COVID-19](#)

Teaching Tolerance: [A Trauma-Informed Approach to Teaching Through Coronavirus](#)

Turnaround for Children: [Coronavirus \(COVID-19\) Pandemic Resources](#)

DISCUSSION GUIDE FOR DISTRICT LEADERS

| | |
|---|---|
|  | How can your district most effectively identify signs of trauma among students and families while schools remain closed? |
|  | How can your district learn from students and families which supports and services they need? |
|  | How can your district collaborate with community partners to support students and families? |
|  | How might your district need to adapt trauma-informed practices to accommodate virtual learning and social distancing? |
|  | Which forms of additional training and resources might your staff need to support students and families? Which resources might families need to support their children? |
|  | Thinking ahead to when schools reopen, which steps can your district take to further mitigate the social-emotional and academic effects of COVID-19? |

Source: Hanover Research and Washington Association of School Administrators¹⁴⁶

¹⁴⁶ Figure reproduced verbatim from: "Learning Loss Through Traumatic Events." Hanover Research and Washington Association of School Administrators, April 2020.

SECTION II: ONLINE INSTRUCTION

In this section, Hanover presents a collection of resources and guides to support online instruction for teachers with and without distance learning experience. This information stems from the recent COVID-19 school closures and may support further distance learning implementation.

REPORT I: TOOLKIT: PLANNING AND DELIVERING ONLINE INSTRUCTION FOR K-12 STUDENTS DURING COVID-19 SCHOOL CLOSURES

INTRODUCTION

The evolving pandemic and expanding school closures have forced teachers, many with no prior experience teaching online, to quickly adapt face-to-face instruction to alternative formats.¹⁴⁷ At the same time, issues with home internet access, device availability, and serving specialized student populations (e.g., students with disabilities, English learners) have further complicated the transition to online instruction.¹⁴⁸ The current situation “means [that], ready or not, schools will have to try to figure out online education.”¹⁴⁹

At this time, teachers must do their best given the tools available to them and remember that, despite the isolation of teaching online, colleagues and school systems should still be available to provide support.¹⁵⁰ Understanding the implications of this new reality, Hanover developed the following toolkit to support teachers in adapting to online platforms and the novel considerations for planning, instruction, and assessment that accompany them.¹⁵¹

IDENTIFY TOOLS TO SUPPORT ONLINE INSTRUCTION

Before planning or delivering instruction in an online format, **teachers should identify and understand the capabilities of the resources and technologies they can use to support online instruction**, either through a subscription purchased by their district or school or through open educational resources.¹⁵² This includes teachers knowing which technologies and resources are available for them to create, publish, and manage online coursework and for students to access digital or distance learning materials and complete learning

¹⁴⁷ Easley, K. “I’ve Been Teaching Online for Years. Here’s How to Prevent Burnout During a School Closure.” Education Week, March 17, 2020. <https://mobile.edweek.org/c.jsp?cid=25919951&bcid=&rssid=25919141&item=http%3a%2f%2fapi.edweek.org%2fv1%2few%2f%3fuuid%3d6E2B9C5E-6862-11EA-B628-8AF258D98AAA>

¹⁴⁸ [1] Burke, M. and S. Johnson. “How Learning Will Change Across California’s K-12 Schools Amid Coronavirus Closures.” EdSource, March 13, 2020. <https://edsources.org/2020/how-learning-will-look-very-different-across-californias-k-12-schools-amid-coronavirus-closures/625623> [2] Goldstein, D. “Coronavirus Is Shutting Schools. Is America Ready for Virtual Learning?” New York Times, March 13, 2020. <https://www.nytimes.com/2020/03/13/us/virtual-learning-challenges.html> [3] Robles, Y. “Amid Coronavirus Fears, the CDC Told Schools to Plan for Remote Learning. That’s Harder Than It Sounds.” Chalkbeat, March 3, 2020. <https://chalkbeat.org/posts/us/2020/03/03/amid-coronavirus-fears-the-cdc-told-schools-to-plan-for-remote-learning-thats-harder-than-it-sounds/> [4] Belsha, K. “Schools Going ‘Remote’ for Coronavirus Must Serve Students with Disabilities.” Chalkbeat, March 12, 2020. <https://chalkbeat.org/posts/us/2020/03/12/school-closures-coronavirus-remote-learning-students-with-disabilities/>

¹⁴⁹ Richards, E. “When Will School Reopen? No Date in Sight, and Schools Struggling to Put Learning Online.” USA Today, March 17, 2020. <https://www.usatoday.com/story/news/education/2020/03/17/coronavirus-school-closings-online-classes-homeschool-zoom/5063384002/>

¹⁵⁰ [1] Weingarten, R. “Confronting the Coronavirus.” American Federation of Teachers, March 15, 2020. <https://www.aft.org/column/confronting-coronavirus> [2] “Navigating Uncertain Times: How Schools Can Cope With Coronavirus.” EdSurge and International Society for Technology in Education. <https://www.edsurge.com/research/guides/navigating-uncertain-times-how-schools-can-cope-with-coronavirus>

¹⁵¹ “Moving to Online Teaching: Issues and Resources for Educators.” Online Learning Consortium, April 28, 2014. https://onlinelearningconsortium.org/news_item/moving-to-online-teaching-issues-and-resources-for-educators/

¹⁵² [1] “Using Digital Technologies to Support Learning and Teaching.” Victoria State Government, November 9, 2018. <https://www.education.vic.gov.au/school/principals/spag/curriculum/Pages/techsupport.aspx#link41> [2] “How People Learn: Brain, Mind, Experience, and School: Expanded Edition, Chapter 9: Technology to Support Learning.” National Academy Press, 2000. pp. 206–207. <https://www.nap.edu/read/9853/chapter/13> [4] Dobo, N. “Digital Learning and Technology.” Education Writers Association and Hechinger Report. <https://www.ewa.org/digital-learning-technology>

tasks.¹⁵³ Without understanding resources, teachers risk planning instruction that cannot be supported by existing hardware and software.¹⁵⁴ Additionally, teachers must know available digital content, instructional software, and hardware to develop activities that best utilize these resources and support student success.¹⁵⁵





Basic Requirements for Online Instruction

| | | | | |
|-----------------------|------------------------------|---|----------------------------------|--|
| Internet Connectivity | Devices with Internet Access | Software to Support Teaching and Learning | IT Support for Used Technologies | Training on Usage of Deployed Technologies |
|-----------------------|------------------------------|---|----------------------------------|--|

Source: eSchool News¹⁵⁶

In particular, teachers should become familiar with the skills they and their students will need to use specific technologies.¹⁵⁷ All users must be able to operate the available devices and digital platforms and applications for online learning to be effective.¹⁵⁸ Issues with access and operation of technologies are multi-faceted, and teachers should determine the potential benefits of using certain technology while also anticipating and acknowledging the challenges that may arise when planning and delivering instruction online.¹⁵⁹

Challenges to Teaching and Learning Online

| CHALLENGE | DESCRIPTION |
|---|--|
|  Knowledge and Comfort Using Technology | Teachers and students may be unfamiliar with a digital platform or application, resulting in difficulty accessing content and completing tasks—at least initially. To mitigate these concerns, teachers should seek training and advice from colleagues on using available resources. Teachers also should provide students with clear and specific directions for using adopted technologies and digital resources. |
|  Need to Redesign Curriculum | Teaching and learning online differs significantly from in-person instruction, necessitating modification of pedagogies (e.g., assessment) and learning tasks (e.g., individual assignments). As such, teachers should consider the capabilities of those tools they and their students have at their disposal and how those tools support content and skills in the target subject or grade level. |
|  Presentation of Directions and Content | Like the regular classroom environment, teachers will need to accommodate a variety of learning styles and needs via online instruction. Thus, they should clearly communicate expectations and directions for student work and present content in several ways (e.g., video, audio, text, interactive media) and via multiple iterations. |
|  Facilitation of Learning | Teachers will be unable to directly oversee students' work—unless they have access to and require live video or audio conferencing. Consequently, monitoring student understanding and maintaining on-task learning time can be challenging. Establishing mechanisms for student-to-student interaction (e.g., discussion forums) and providing formative and summative feedback at critical junctures in the learning process are vital to success. |

Source: Multiple¹⁶⁰

¹⁵³ West, P. "This Is How Your Infrastructure Should Look Before Your Next Tech Rollout." ESchool News, February 3, 2016.

<https://www.eschoolnews.com/2016/02/03/this-is-how-your-infrastructure-should-look-before-your-next-tech-rollout/>

¹⁵⁴ "Building Technology Infrastructure for Learning." Office of Educational Technology, U.S. Department of Education, June 2017. pp. 7, 9–14, 48–49, 54–55. <https://tech.ed.gov/files/2017/07/2017-Infrastructure-Guide.pdf#page=49&zoom=100,0,0>

¹⁵⁵ Roddy, C. et al. "Applying Best Practice Online Learning, Teaching, and Support to Intensive Online Environments: An Integrative Review." *Frontiers in Education*, 2, 2017. <https://www.frontiersin.org/articles/10.3389/educ.2017.00059/full>

¹⁵⁶ West, Op. cit.

¹⁵⁷ McNeely, Be. "Using Technology as a Learning Tool, Not Just the Cool New Thing." EDUCAUSE.

<https://www.educause.edu/research-and-publications/books/educating-net-generation/using-technology-learning-tool-not-just-cool-new-thing>

¹⁵⁸ Friedman, D. "Supporting Student Success in Online Learning." *Getting Smart*, February 28, 2019.

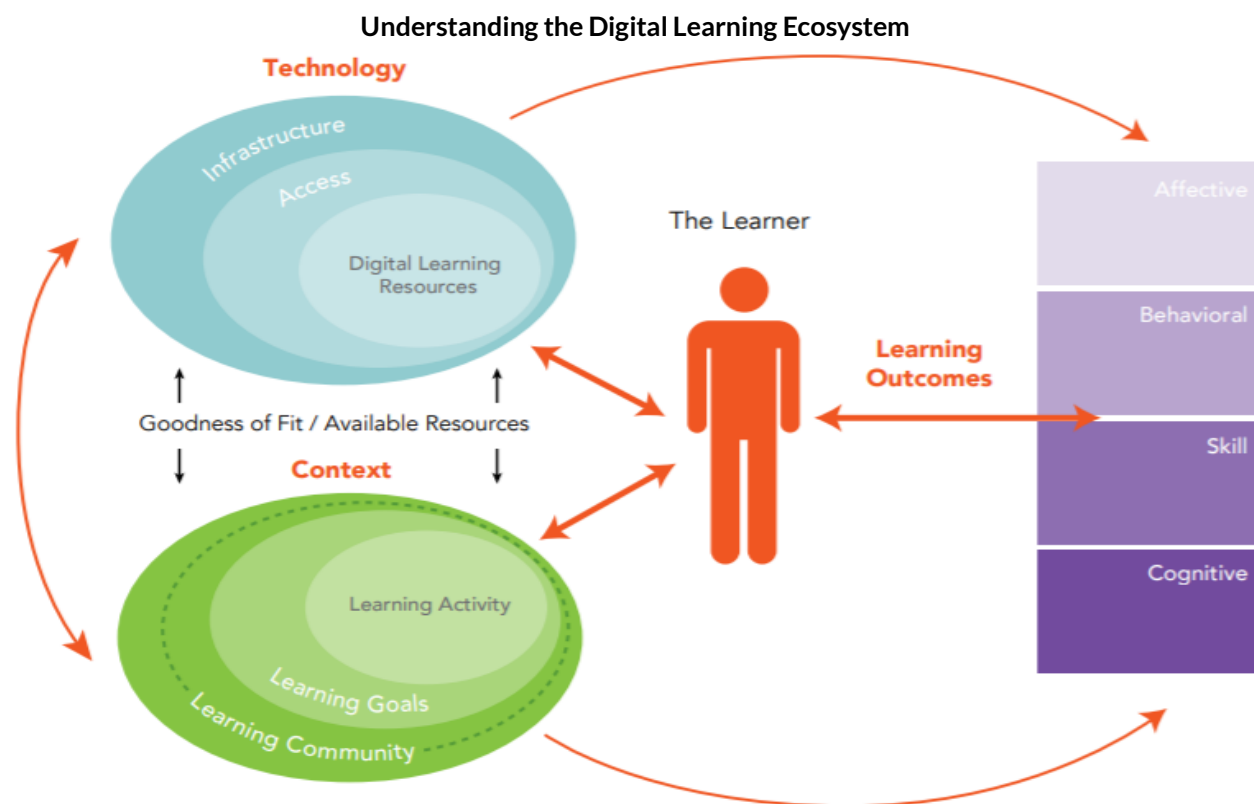
<https://www.gettingsmart.com/2019/02/supporting-student-success-in-online-learning/>

¹⁵⁹ Gura, M. and B. Percy. "Technology Infrastructure." *EdTech*, October 31, 6AD.

<https://edtechmagazine.com/k12/article/2006/10/technology-infrastructure>

¹⁶⁰ Figure adapted from: [1] "Benefits and Challenges of Online Instruction." Massachusetts General Hospital Institute of Health Professions. <https://www.mghihp.edu/faculty-staff-faculty-compass-teaching/benefits-and-challenges-online-instruction> [2] Hardy, L. "The A-Z of Online Teaching Challenges." *ELearning Industry*, June 14, 2017. <https://elearningindustry.com/online->

Evaluating students' ability to understand digitized curricula and participate in online instructional activities—both in logistical terms (e.g., internet connectivity) and technological skills (e.g., navigating digital platforms)—is integral to successful online instruction.¹⁶¹ Such considerations encompass supporting student needs in a variety of areas, including how to address differences in their cognitive and social-emotional development and their individual and cultural backgrounds.¹⁶² Relatedly, teachers must consider how to support special student populations such as English learners and students with disabilities.¹⁶³



Source: Stanford Center for Opportunity Policy in Education and Alliance for Excellent Education¹⁶⁴

teaching-challenges-a-z [3] Kebritchi, M., A. Lipschuetz, and L. Santiago. "Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review." *Journal of Educational Technology Systems*, 46:1, September 2017. pp. 8–21. [4] Ely, E. "Teaching Online: Challenges and Solutions." Mary Baldwin University, February 23, 2018. <https://go.marybaldwin.edu/education/2018/02/23/teaching-online-challenges-solutions/> [5] "Benefits and Challenges of Online Learning?" University of Pennsylvania. https://canvas.upenn.edu/courses/1320001/pages/benefits-and-challenges-of-online-learning?module_item_id=13004522

¹⁶¹ [1] "Internet Access and Education: Key Considerations for Policy Makers." Internet Society, November 20, 2017. <https://www.internetsociety.org/resources/doc/2017/internet-access-and-education/> [2] Egbert, J. "Methods of Education Technology: Principles, Practice, and Tools, Chapter 8 Supporting Student e-Learning – Methods of Education Technology: Principles, Practice, and Tools." Pressbooks | Washington State University. <https://opentext.wsu.edu/tchlrn445/chapter/chapter-8-supporting-student-e-learning/>

¹⁶² [1] Crews, T., S. Sheth, and T. Horne. "Understanding the Learning Personalities of Successful Online Students." EDUCAUSE Review, February 24, 2014. <https://er.educause.edu/articles/2014/2/understanding-the-learning-personalities-of-successful-online-students> [2] Roddy et al., Op. cit. [3] Hebert, C. "Meeting the Needs of Online Learners: Literature Review." Sam Houston State University, December 2016. pp. 4–9, 12–16. https://www.researchgate.net/publication/317098856_Meeting_the_Needs_of_Online_Learners_Literature_Review

¹⁶³ [1] Deschaine, M.E. "Supporting Students with Disabilities in K-12 Online and Blended Learning." Michigan Virtual University, December 20, 2019. <https://michiganvirtual.org/research/publications/supporting-students-with-disabilities-in-k-12-online-and-blended-learning/> [2] Dennehy, D. "Supporting English Language Learners Online." Online Network of Educators, October 9, 2017. <https://onlinenetworkofeducators.org/2017/10/09/supporting-ells-online/>

¹⁶⁴ Screenshot taken directly from: Darling-Hammond, L., M.B. Zieleszinski, and S. Goldman. "Using Technology to Support At-Risk Students' Learning." Stanford Center for Opportunity Policy in Education and Alliance for Excellent Education. p. 4.

A number of digital applications, online platforms, and other technologies may be available to teachers and students depending on the resources provided by their district and school and the investments made by families in in-home technologies. In other words, teachers and their students may have access to a wealth of online tools and resources, or teachers and their students may have more limited options for digital instruction.¹⁶⁵ Consequently, it is helpful for teachers to brainstorm how they can use a variety of resource types—subscription-based and open-source—to support student learning.¹⁶⁶

Categories of Online Teaching and Learning Technologies

| CATEGORY | DESCRIPTION |
|--|--|
| Collaboration and Communication | These technologies allow users to exchange questions and responses and share and edit files and documents with one another in real-time. Sample tools include Google Hangouts , Join.Me , and Skype . |
| Problem-Solving Practice and Assessment | These technologies provide users with repeated tasks of a similar nature and novel problems for specific content or skills, sometimes personalized to the individual student. Sample tools include Get More Math! , IXL Learning , and Amplify ELA . |
| Tutorials and Reference Materials | These technologies use video, audio, and text to explain important concepts and demonstrate target skills and procedures. Sample tools include Khan Academy , Open Culture , and Smithsonian Learning Lab . |
| Multimedia Tools | These technologies allow users to develop creative products using audio-visual, graphics/visualization, and word processing applications. Sample tools include Prezi , Animoto , and Google Docs . |
| Simulations and Games | These technologies require users to leverage digital tools and functions to solve problems, conduct experiments, and simulate real-world scenarios. Tools include PBS Kids , Sheppard Software , and National Geographic Kids . |
| Learning Management Systems | These platforms help teachers organize all materials and resources for a given class (including other digital tools) in a central location for student access. Platforms include Google Classroom , Blackboard Learn , and Canvas . |

Source: Multiple¹⁶⁷

Importantly, teachers should first reference digital tools and online learning resources collected and reviewed by their district or school or their state education agency before embarking on a self-driven

¹⁶⁵ [1] KewalRamani, A. et al. "Student Access to Digital Learning Resources Outside of the Classroom." National Center for Education Statistics, Institute of Education Sciences, April 2018. pp. xi–xvi. <https://nces.ed.gov/pubs2017/2017098.pdf> [2] Johnson, D. "Helping to Close the Digital Divide." *Educational Leadership*, 72:5, February 2015. <http://www.ascd.org/publications/educational-leadership/feb15/vol72/num05/Helping-to-Close-the-Digital-Divide.aspx> [3] Steele-Carlin, S. "Caught in the Digital Divide." *Education World*, 2000. https://www.educationworld.com/a_tech/tech041.shtml [4] Herold, B. "Poor Students Face Digital Divide in How Teachers Learn to Use Tech." *Education Week*, June 15, 2017. <https://www.edweek.org/ew/articles/2017/06/14/poor-students-face-digital-divide-in-teacher-technology-training.html>

¹⁶⁶ [1] "Teaching and Learning Using Technology." Poorvu Center for Teaching and Learning, Yale University. <https://poorvucenter.yale.edu/graduate-students/resources-graduate-student-teachers/teaching-and-learning-using-technology> [2] "Technology for Teaching and Learning." American Institutes for Research. <https://www.air.org/topic/education/technology-teaching-and-learning>

¹⁶⁷ Figure adapted from: [1] van den Berg, E., P. Blijleven, and L. Jansen. "Digital Learning Materials: Classification and Implications for the Curriculum." Ververs Foundation, 2004. pp. 2–8. http://link.springer.com/10.1007/978-94-017-1205-7_14 [2] "Teaching with Technology." Center for Teaching and Learning, University of Washington. <https://www.washington.edu/teaching/topics/engaging-students-in-learning/teaching-with-technology-2/> [3] McGilvery, C. "Communication Technologies: Promoting Active Online Learning." *Education World*, 2013. https://www.educationworld.com/a_tech/active-online-learning-communication-tools.shtml [4] "Use of Technology in Teaching and Learning." U.S. Department of Education. <https://www.ed.gov/oii-news/use-technology-teaching-and-learning> [5] "Best Education Software." G2. <https://www.g2.com/categories/education> [6] Cennamo, K., J. Ross, and P. Ertmer. "Types of Educational Software." Cengage Learning, 2010. pp. 1–6. http://www.cengage.com/resource_uploads/downloads/0495090476_151112.pdf [7] "Online Teaching Tools and Resources." Center for Language Study, Yale University. <https://cls.yale.edu/faculty/resources/online-teaching-tools-and-resources> [8] Dyer, K. "75 Digital Tools and Apps Teachers Can Use to Support Formative Assessment in the Classroom." Northwest Evaluation Association, January 31, 2019. <https://www.nwea.org/blog/2019/75-digital-tools-apps-teachers-use-to-support-classroom-formative-assessment/>

search, as this will save time and act as a baseline filter of quality.¹⁶⁸ Teachers can review materials from state education agencies—often originating from offices of online learning, distance learning, or curriculum and instruction—to identify digital curricula and instructional resources that have been vetted for standards alignment and overall quality.¹⁶⁹ Teachers also can identify open educational resources by referring to the Supplemental Resources and Readings section of this toolkit on pages 45 and 46.

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Teachers can use this toolkit’s Evaluating Existing Digital Technologies Worksheet on page 34 to identify and assess the functionality of the digital tools and web-based technologies they have at their disposal through district or school resources or open educational resources. This worksheet specifically helps teachers record the benefits, curricular applications, and potential challenges of using a given tool.

Likewise, the Quality of Online Courses and Digital Resources Rubric subsection on pages 35 and 36 gives teachers a mechanism to evaluate the quality of online courses and other digital resources they identify themselves or have access to via their state or local educational agency. Using the rubric will help teachers select the most effective tools for their instructional needs.

Rubrics for Evaluating Open Educational Resources

Achieve—an nonprofit organization that provides technical assistance, performs policy and advocacy work, and conducts research on college and career readiness—publishes eight rubrics (available in a single PDF file via the hyperlinked icon below) to “help states, districts, teachers, and other users determine the degree of alignment of Open Educational Resources (OER) to college- and career-ready standards and to determine other aspects of quality of OER.” These rubrics include:

- I: Degree of Alignment to Standards
- II: Quality of Explanation of the Subject Matter
- III: Utility of Materials Designed to Support Teaching
- IV: Quality of Assessment
- V: Quality of Technological Interactivity
- VI: Quality of Instructional and Practice Exercises
- VII: Opportunities for Deeper Learning
- VIII: Assurance of Accessibility



Source: Achieve¹⁷³

¹⁶⁸ [1] Loewus, L. and M. Molnar. “For Educators, Curriculum Choices Multiply, Evolve.” Education Week, March 28, 2017. <https://www.edweek.org/ew/articles/2017/03/29/for-educators-curriculum-choices-multiply-evolve.html> [2] Tepe, L. and T. Mooney. “Navigating the New Curriculum Landscape: How States Are Using and Sharing Open Educational Resources, What Are States Doing?” New America, May 22, 2018. <https://www.newamerica.org/education-policy/reports/navigating-new-curriculum-landscape/> [3] “FAQs: Frequently Asked Questions.” U.S. Department of Education. <https://www.ed.gov/answers/> [4] “State Virtual Schools.” Digital Learning Collaborative, September 25, 2018. <https://www.digitallearningcollab.com/state-virtual-schools>

¹⁶⁹ [1] “Blended and Online Learning.” Office of Blended and Online Learning, Colorado Department of Education. <https://www.cde.state.co.us/onlinelearning> [2] “Virtual Education.” Florida Department of Education. <http://www.fldoe.org/schools/school-choice/virtual-edu/> [3] “Approved Online Schools and School Programs.” Washington Office of Superintendent of Public Instruction. <https://www.k12.wa.us/student-success/learning-alternatives/online-learning/approved-online-schools-and-school-programs> [4] “Distance Education Programs.” New York State Education Department. <http://www.nysed.gov/college-university-evaluation/distance-education-programs>

¹⁷⁰ “How to Find and Evaluate OER.” Iowa State University, December 28, 2017. <https://www.youtube.com/watch?v=FbwuMQM-NG8>

¹⁷¹ “OER Search.” Open Oregon Educational Resources, September 27, 2016. https://www.youtube.com/watch?v=ID194Zq3AxM&feature=emb_title

¹⁷² “ITC - Learn How to Evaluate Educational Web Resources - Integrating Technology In The Classroom.” SimpleK12, July 22, 2011. <https://www.youtube.com/watch?v=kDgNWBVoXpw>

¹⁷³ Figure adapted from: [1] “About Achieve.” Achieve. <https://www.achieve.org/about-us> [2] “What We Do.” Achieve. <https://www.achieve.org/what-we-do> [3] “Achieve OER Rubrics.” Achieve, June 24, 2011. <https://www.achieve.org/publications/achieve-oer-rubrics> [4] “Rubrics for Evaluating Open Education Resource (OER) Objects.” Achieve, November 18, 2011. pp. 1–11. https://www.achieve.org/files/AchieveOERRubrics_1.pdf



Evaluating Existing Digital Technologies Worksheet

Directions: Use the table below to record those digital platforms, programs, and applications available for your usage. Then, identify the useful features and instructional applications of each item, as they relate to your grade level or subject area. Finally, record any potential challenges you and your students may need to navigate in using the platform, program, or application.

| CHALLENGES WITH USE | | | | |
|--------------------------------|--|--|--|--|
| INSTRUCTIONAL APPLICATIONS | | | | |
| USEFUL FEATURES | | | | |
| PLATFORM/PROGRAM / APPLICATION | | | | |

Source: Center for Mental Health in Schools, University of California at Los Angeles¹⁷⁴

¹⁷⁴ "Evaluating Existing Digital Technologies Worksheet" adapted from: "Technical Assistance Sampler: Using Technology to Address Barriers to Learning." Center for Mental Health in Schools, University of California - Los Angeles, February 2014. p. 2.
<http://smhp.psych.ucla.edu/pdfdocs/sampler/technology/techno.pdf>



Quality of Online Courses and Digital Resources Rubric

Directions: Use this rubric to evaluate the quality and effectiveness of online courses and digital learning resources you identify through your state education agency, your school or district, or your own research. Criteria include items related to curricular alignment, assessment, and instructional management.

Course/Resource Name:

Course/Resource Provider:

Reviewer:






Date of Review:

| CRITERIA | UNABLE TO DETERMINE | DOES NOT MEET | PARTIALLY MEETS | MEETS |
|---|---------------------|---------------|-----------------|-------|
| The state or local education agency has reviewed the course/resource for quality. | | | | |
| Content and assessments are aligned with the state's academic standards. | | | | |
| The course/resource engages students in tasks that address various learning styles. | | | | |
| The course/resource asks students to engage in abstract thinking and critical reasoning. | | | | |
| The course/resource includes fair, adequate, and appropriate methods and procedures to assess students' mastery of content. | | | | |
| The course/resource facilitates appropriate teacher-to-student interaction, including timely, frequent feedback. | | | | |
| The course/resource facilitates appropriate student-to-student interaction and provides a plan for monitoring that interaction. | | | | |
| Teacher can adapt activities and assessments to accommodate students with disabilities and English learners. | | | | |
| The course/resource complies with the Americans with Disabilities Act. | | | | |
| The course/resource gives students access to supplemental materials to enrich content. | | | | |
| A complete, clear course syllabus or resource description is available for review. | | | | |
| Issues associated with the use of copyrighted materials are addressed. | | | | |
| Student work and personal data are secure. | | | | |
| Students can be monitored to ensure academic honesty. | | | | |

ADAPT PEDAGOGIES TO ONLINE LEARNING

Teachers should recognize and accept that the abrupt shift to online learning will be disruptive to themselves and students, making flexibility, positivity, and calmness under pressure essential to successfully navigating the transition.¹⁷⁶ In particular, teachers should understand that there will be challenges, but that—with creativity, the support of colleagues and school systems, and a willingness to adapt and experiment—they can succeed in providing high-quality instruction to their students even in the absence of face-to-face learning time.¹⁷⁷ Furthermore, teachers should appreciate that available research indicates online instruction can be as effective—and potentially more effective in some cases—than in-person instruction, dependent on the quality of implementation.¹⁷⁸

Practical Tips to Adapt Curricula and Instruction for Online Learning

| STRATEGY | DESCRIPTION |
|---|--|
|  Set Realistic Expectations | Given the rapidity with which schools have closed, teachers and students have had to adapt quickly and often without sufficient preparation. As such, teachers should honestly reflect on which learning outcomes are achievable and what reasonable expectations look like for themselves and their students. |
|  Communicate Regularly | Ambiguity around expectations and the briskness with which teachers and students have had to adapt present unique challenges. Teachers need to articulate how students and their families should communicate with them and one another to accomplish educational tasks. At the same time, teachers need to be available and willing to accommodate difficulties students have using online learning formats. |
|  Maintain Focus on Learning Objectives | While teachers may be comfortable delivering instruction in a certain way, they must be creative in how they develop online learning activities. Essentially, the primary concern should be providing an appropriate pathway for students to achieve curriculum objectives and state and local learning standards. |
|  Test Content and Technology Before Deployment | This strategy comes with the caveat that, during the current crisis, teachers may be unable to conduct extensive testing prior to using technologies with students. To the extent that is possible and reasonable, teachers should explore and test the educational tools they intend to use to increase familiarity with key functions and identify potential challenges in usage. |
|  Appreciate New Opportunities | Though an immediate transition to online learning is likely stressful, teachers should consider how it will allow them to experiment with new resources and strategies. Teachers may discover an innovative method for teaching a particular content item that they can apply in subsequent school years. |

Source: Johns Hopkins University¹⁷⁹

Teachers should reorient their own and their students' expectations and routines. Instruction fundamentally changes when moving from the physical classroom to the digital space, altering the scheduling and timing of

¹⁷⁶ Darvasi, P. "Resources for Teaching and Learning During This Period of Social Distancing." KQED, March 16, 2020. <https://www.kqed.org/mindshift/55521/resources-for-teaching-and-learning-during-this-period-of-social-distancing>

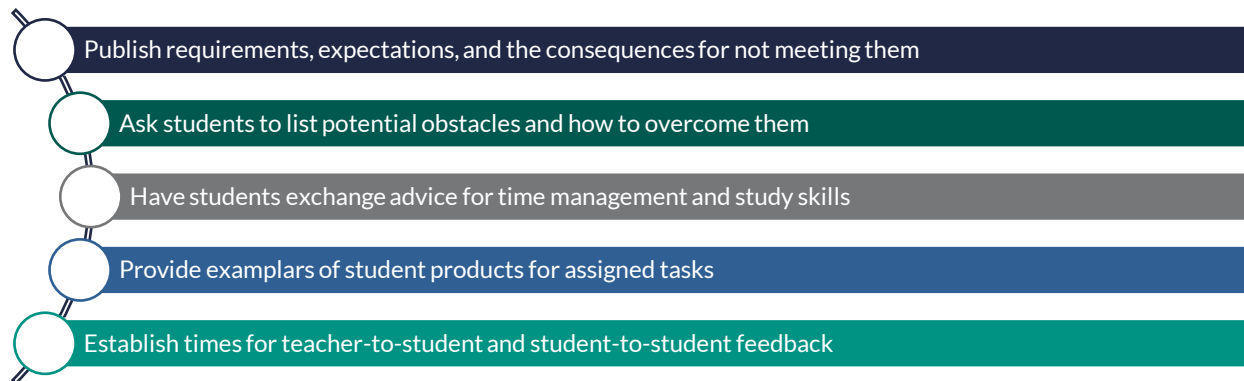
¹⁷⁷ [1] Srba, K. "Resources and Tips for Remote Education During School Closures." THE Journal, March 16, 2020. <https://thejournal.com/articles/2020/03/16/resources-tips-for-remote-education-during-school-closures.aspx> [2] Nazerian, Ti. "Moving from Face-to-Face to Online Teaching Can Be Hard. Here's One Expert's Advice." EdSurge, November 14, 2018. <https://www.edsurge.com/news/2018-11-14-moving-from-face-to-face-to-online-teaching-can-be-hard-here-s-one-expert-s-advice> [3] Chiasson, K., K. Terras, and K. Smart. "Faculty Perceptions of Moving a Face-To-Face Course to Online Instruction." *Journal of College Teaching and Learning*, 12:4, 2015. pp. 236–238. <https://files.eric.ed.gov/fulltext/EJ1067275.pdf>

¹⁷⁸ Smith, B. and C. Brame. "Blended and Online Learning." Center for Teaching, Vanderbilt University. <https://cft.vanderbilt.edu/guides-sub-pages/blended-and-online-learning/>

¹⁷⁹ Figure adapted from: Cruickshank, S. "How to Adapt Courses for Online Learning: A Practical Guide for Faculty." Johns Hopkins University, March 12, 2020. <https://hub.jhu.edu/2020/03/12/how-to-teach-online-courses-coronavirus-response/>

learning and the vehicles by which teachers teach and students learn.¹⁸⁰ This means that teachers should clearly understand and articulate their school's—or if these are unestablished, their own— expectations for when students should be online completing schoolwork and when students can expect teachers to be available to deliver direct instruction or support independent learning tasks. Similarly, teachers should outline the methods they intend to use in instruction so students and their families can be prepared.¹⁸¹ Indeed, increasing the level of clarity attached to instruction, expectations, and communications can greatly facilitate teaching and learning.¹⁸²¹⁸³

Strategies to Set Expectations for Online Learning



Source: Carolina Distance Learning | Carolina Biological Supply Company¹⁸⁴

Given the isolating nature of online learning and social distancing, **teachers also must maintain connections with students and promote communication and collaboration among students.**¹⁸⁵ Physical separation means that teachers and students may engage in educational activities at the same time (i.e., synchronous learning) or at different times (i.e., asynchronous learning).¹⁸⁶ Thus, teachers should devote extra effort and attention to regularly connecting with individual students around their progress and establishing mechanisms by which students can work together.¹⁸⁷ For example, teachers should be available during scheduled class time, promptly respond to questions submitted outside of scheduled class time, communicate regularly regarding deadlines, and provide “meaningful feedback on student work using clear and concise language” in print or via an audio or video chat application.¹⁸⁸ Comparatively, activities such as “small group assignments, case studies, simulations, and group discussions” can facilitate student-to-student interaction.¹⁸⁹ Such strategies are vital to maintaining social presence (i.e., “the ability of participants within

¹⁸⁰ Cavanaugh, C. “Getting Students More Learning Time Online: Distance Education in Support of Expanded Learning Time in K-12 Schools.” Center for American Progress and Eli and Edythe Broad Foundation, May 2009. pp. 14–15.

<https://www.americanprogress.org/wp-content/uploads/issues/2009/05/pdf/distancelearning.pdf>

¹⁸¹ Snelling, J. and D. Fingal. “10 Strategies for Online Learning During a Coronavirus Outbreak.” International Society for Technology in Education, March 16, 2020. <https://www.iste.org/explore/10-strategies-online-learning-during-coronavirus-outbreak>

¹⁸² “Tips for Teaching When Face-to-Face Meetings Not Possible.” College of Engineering and Applied Science, University of Cincinnati. <https://ceas.uc.edu/coronavirus/help-for-instructors/tips-for-teaching-when-face-to-face-meetings-not-possible.html>

¹⁸³ Figure adapted from: Songer, S. “Setting Student Expectations for Distance Learning.” Carolina Distance Learning | Carolina Biological Supply Company. p. 2. http://landing.carolina.com/Global/FileLib/dl-content/dl_student_expectations.pdf

¹⁸⁴ Figure adapted from: Songer, S. “Setting Student Expectations for Distance Learning.” Carolina Distance Learning | Carolina Biological Supply Company. p. 2. http://landing.carolina.com/Global/FileLib/dl-content/dl_student_expectations.pdf

¹⁸⁵ Darvasi, Op. cit.

¹⁸⁶ [1] “Guide to Teaching Online Courses.” National Education Association. p. 5. <http://www.nea.org/assets/docs/onlineguide.pdf>

[2] “Synchronous Learning.” Glossary of Education Reform | Great Schools Partnership, August 29, 2013.

<https://www.edglossary.org/synchronous-learning/>

¹⁸⁷ Spataro, J. “Helping Teachers and Students Make the Switch to Remote Learning.” Microsoft, March 11, 2020.

<https://www.microsoft.com/en-us/microsoft-365/blog/2020/03/11/helping-teachers-students-switch-remote-learning/>

¹⁸⁸ [1] Ely, S. “Five Expectations Students Should Have of an Online Instructor.” ELearn Magazine, October 2011.

<https://elearnmag.acm.org/archive.cfm?aid=2048939> [2] “Best Practices and Expectations for Online Teaching.” Purdue University. <https://engineering.purdue.edu/online/best-practices-and-expectations-for-online-teaching>

¹⁸⁹ Smith and Brame, Op. cit.

the online learning community to project their personal characteristics into the community and present themselves as real people”) for both the teacher and their students.¹⁹⁰

Similarly, teachers need to consider the design of their at-home workspace and how that will impact their ability to stay productive and still meet the needs of students.¹⁹¹ Indeed, teachers should minimize the potential for distraction and organize their physical and digital workspaces to most efficiently address student needs, while also maximizing their own comfort and teaching style.¹⁹²

Tips for Teachers to Organize Their Workspace

| TIPS FOR ORGANIZING A DIGITAL WORKSPACE | TIPS FOR ORGANIZING A PHYSICAL WORKSPACE |
|---|--|
| <ul style="list-style-type: none"> ▪ Clear your virtual desktop and remove icons from the startup menu that make your system run slower ▪ Scan paper documents, when possible, and save digital documents ▪ Place all documents in folders with clear file names so you can easily retrieve them ▪ Alphabetize file names and be consistent in your filing system ▪ Organize the folders for all the classes you teach as soon as possible ▪ Archive emails in folders labeled with the course name and term ▪ Create shortcuts on your desktop for programs, folders, and websites you use frequently ▪ Create bookmarks for common internet sites. ▪ Use a calendar with deadlines and note priorities | <ul style="list-style-type: none"> ▪ Set up a space that is separate from your family life and area and allows for quiet and privacy ▪ Consider a door with a lock or a “do not disturb” sign if you live with others ▪ Communicate proactively to those sharing your living space of the need to respect your workspace and work hours ▪ Set up in an area with good light; lights should be directed toward the side of or behind your line of vision ▪ Make sure you have high speed internet service with antivirus and malware protection software to protect you and your students’ systems ▪ Consider a desk you can raise and lower to avoid the negative health effects of sitting for long periods of time ▪ Use a comfortable, supportive, and perhaps ergonomic chair as you will likely be sitting for long periods of time ▪ Have computer paper, pens, and notebooks on hand ▪ Do not slump or round your shoulders as fatigue will quickly set in ▪ Consider using a footrest that allows you to push back into your chair |

Source: Michigan Virtual¹⁹³

When designing and delivering online instruction, **teachers should consider general best practices and pedagogies and how digital platforms and technologies support their implementation.**¹⁹⁴ Teachers should reflect on the needs of their students, their subject matter and grade-level learning standards, and their own

¹⁹⁰ Esani, M. “Moving from Face-to-Face to Online Teaching.” *Journal of the American Society for Medical Technology*, 23:3, June 2010. p. 187. https://www.researchgate.net/publication/45826255_Moving_from_Face-to-Face_to_Online_Teaching

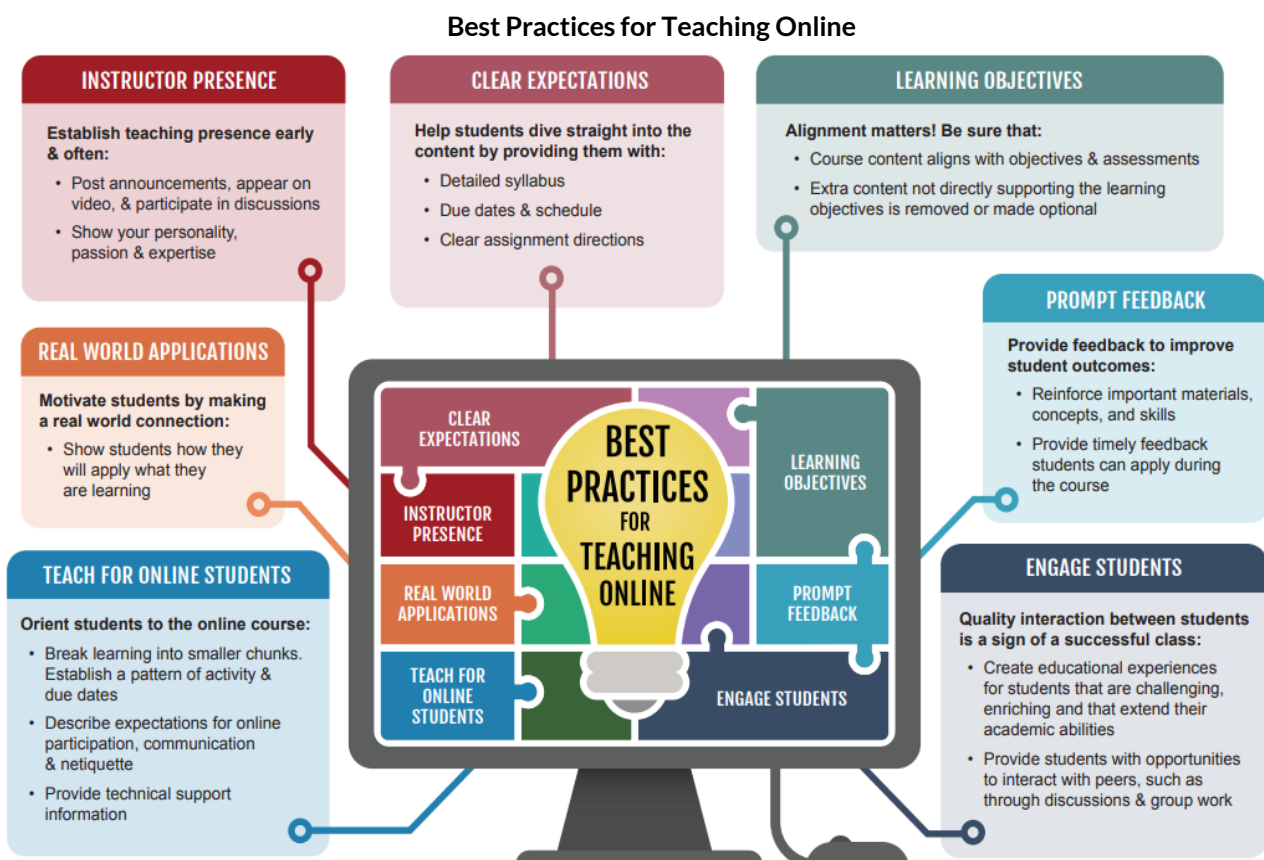
¹⁹¹ [1] Bell-Meterau, M. “How to Prepare to Work from Home in a Telecommuting Job or Business.” *Money Crashers*, March 16, 2020. <https://www.moneycrashers.com/prepare-telecommuting-work-from-home-job-business/> [2] Devaney, E. “How to Work from Home: 20 Tips from People Who Do It Successfully.” *HubSpot*, March 13, 2020. <https://blog.hubspot.com/marketing/productivity-tips-working-from-home> [3] Noguchi, Y. “Coronavirus Triple Duty: Working, Parenting, and Teaching from Home.” *WAMU 88.5 American University Radio | National Public Radio*, March 17, 2020. <https://www.npr.org/2020/03/17/816631571/coronavirus-triple-duty-working-parenting-and-teaching-from-home>

¹⁹² [1] Phillips, J. “7 Tips on How to Prepare for Teaching Online.” *ELearning Industry*, October 20, 2016. <https://elearningindustry.com/7-tips-prepare-for-teaching-online> [2] VanBuren, E. “7 Tips for Creating a Home Workspace.” *Inside Higher Ed*, November 17, 2013. <https://www.insidehighered.com/blogs/gradhacker/7-tips-creating-home-workspace> [3] “Prepare to Learn, Work, or Teach Remotely.” *University of Rochester*. <https://tech.rochester.edu/prepare-to-work-or-teach-remotely/>

¹⁹³ Figure contents quoted verbatim, with minor adaptations, from “Teacher Guide to Online Learning.” *Michigan Virtual*, 2017. pp. 8–9. <https://mvlri.org/wp-content/uploads/2017/08/Teachers-Guide.pdf>

¹⁹⁴ Wahl, L. and J. Duffield. “Using Flexible Technology to Meet the Needs of Diverse Learners: What Teachers Can Do.” *WestEd*, 2005. p. 7. https://www.wested.org/online_pubs/kn-05-01.pdf

personal teaching style to determine how available technologies and digital resources support adaptation of currently-used pedagogies or necessitate the adoption of new techniques.¹⁹⁵



Source: Arizona State University¹⁹⁶

Broadly speaking, teachers should utilize the following best practices for online instruction to the extent possible given the available resources and their familiarity with them:¹⁹⁷

- **Instruction should be student-centered.** In online instruction, sole reliance on traditional lecture-based learning is impractical. Instead, teachers should serve as facilitators and educational coaches, designing challenging activities and providing effective guidance and quality feedback.
- **Learning should be collaborative in nature.** Online instruction should contain small-group activities and team projects where students must collaborate, in order to foster an online community of learners.
- **Courses should foster information, communication, and technology skills necessary for college- and career-readiness and success.** Online instruction should fully utilize the online environment to develop effective digital information, communication, and interpersonal skills and collaboration and team-building skills. In addition, instructional activities should require students to use inventive thinking skills such as creativity, problem-solving, and critical thinking.
- **Instructional format, expectations, and directions should be clear and concise.** Online instruction should be interactive and use the full range of resources and tools offered by the internet. That effort

¹⁹⁵ "Best Practices: Online Pedagogy." Harvard University. <https://teachremotely.harvard.edu/best-practices>

¹⁹⁶ Screenshot taken directly from: Salcido, A. and J. Cole. "Best Practices for Teaching Online." Arizona State University, September 10, 2018. <https://teachonline.asu.edu/2018/09/best-practices-for-teaching-online/>

¹⁹⁷ Bulleted text quoted verbatim, with minor adaptations, from: "Guide to Teaching Online Courses," Op. cit., pp. 6–7.

should include the consistent use of clear and specific directions and online materials that are aesthetically pleasing. As with quality face-to-face instruction, online instruction should set forth clear expectations for students and include specific grading rubrics.

- **Activities and assessments should account for different learning styles.** Because students have unique learning styles, online instruction should include activities and assessments that are varied to meet the learning styles of all students.

Teachers can use the subsequent two evaluation tools—the Reflective Questions for Instructional and Curriculum Adaptations on page 42 and the Online Teaching and Learning Self-Evaluation Form on pages 43 and 44—to support conversion of their face-to-face lessons to online platforms. These resources will ask teachers to scrutinize how digital applications and technologies support teaching and learning for their assigned subject and grade level and will provide teachers with criteria upon which to self-evaluate the effectiveness of their online instruction.



Reflective Questions for Instructional and Curriculum Adaptations

Directions: Use the questions and prompts below to drive brainstorming and reflection on instructional planning and curriculum adaptations when transitioning from face-to-face to online learning formats.

- ❓ What new factors do you take into account in your teaching and course design and what elements of classroom practice do you maintain?
- ❓ What do you currently know, or have you recently learned, about students' needs, preferences, concerns, and success rates with online learning?
- ❓ What specific strengths and limitations for online delivery are linked to the subject matter and grade level which you teach or for which you prepare resources?
- ❓ What new demands are students making in terms of how they want to be taught and assessed? What are your responses?
- ❓ What new demands are families making in terms of how they want students to be taught and assessed? What are your responses?
- ❓ What new roles are students taking in their online learning? How has this changed your teaching practice?
- ❓ What new areas of student support are being built into course structures to facilitate effective online learning, and what new strategies are developed to deliver them?
- ❓ Which technologies are you using? What strengths and challenges do they present for online course design delivery, assessment, student interaction, and student support in your assigned grade level and subject area?

Source: TeachOnline.ca¹⁹⁸

¹⁹⁸ "Reflective Questions for Instructional and Curriculum Adaptations" contents taken verbatim, with minor adaptations, from: "A New Pedagogy Is Emerging... and Online Learning Is a Key Contributing Factor." TeachOnline.Ca, March 7, 2018. <https://teachonline.ca/tools-trends/how-teach-online-student-success/new-pedagogy-emerging-and-online-learning-key-contributing-factor>



Online Teaching and Learning Self-Evaluation Form

Directions: Use the rubric below to self-assess the quality of your school's or your individually-developed online teaching and learning program. All criteria derive from the International Association for K-12 Online Learning's (iNACOL) National Standards for Quality Online Programs, specifically those standards focusing on teaching and learning.

Scores correspond to the following descriptions:

- **5 = Exemplary:** a model of best practice as related to the listed criterion;
- **4 = Accomplished:** excellent implementation of the listed criterion, comparable to other examples;
- **3 = Promising:** good implementation of the listed criterion, though implementation is somewhat lacking in depth or detail;
- **2 = Incomplete:** partial implementation of the listed criterion, requiring additional work and attention;
- **1 = Confusing:** implementation of the listed criterion is not obvious or poor, requiring additional work and attention; and
- **N/A = Not Applicable:** standard does not apply.

| CRITERIA | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| <i>Curriculum and Course Design: A quality online program will have a well thought-out approach to its curriculum and course design whether it develops its own courses and/or licenses curriculum from other educational providers.</i> | | | | | | |
| Has clearly stated and attainable educational goals | | | | | | |
| Is clear and coherent in its organization | | | | | | |
| Utilizes quality instructional materials and appropriate technology that enable and enrich student learning | | | | | | |
| Demonstrates rigorous course content | | | | | | |
| Provides for high-degree of interaction between teacher, learners, parents, and among learners themselves | | | | | | |
| Embeds critical thinking, problem solving, analysis, integration, and synthesis abilities in learning activities | | | | | | |
| Meets requirements of appropriate state or national standards, including applicable end of course assessments | | | | | | |
| Meets requirements of accessibility for individuals with disabilities | | | | | | |
| Meets requirements of copyright and fair use | | | | | | |
| Is designed to accommodate different learning styles | | | | | | |
| Is designed with consideration for time and place limitations of students | | | | | | |

| CRITERIA | N/A | 1 | 2 | 3 | 4 | 5 |
|---|-----|---|---|---|---|---|
| <i>Instruction: A quality online program takes a comprehensive and integrated approach to ensuring excellent online teaching for its students. This process begins with promising practices but is equally committed to continuous improvement and adaptation to student learning needs through professional development.</i> | | | | | | |
| Is grounded in the program's mission, beliefs, and expectations for student learning | | | | | | |
| Is supported by research and best practice | | | | | | |
| Is continually refined based on assessment of stakeholders' needs | | | | | | |
| Is adaptable to best serve different student learning styles | | | | | | |
| Is sensitive to the cultural differences of students | | | | | | |
| Includes frequent teacher-to-student interaction, teacher-to-parent interaction, and fosters frequent student-to-student interaction | | | | | | |
| Is sensitive to time and place limitations of students | | | | | | |
| Faculty hold the required state certifications | | | | | | |
| Faculty are trained in and demonstrate competency in online instructional methodologies and learning technologies | | | | | | |
| Includes a process to monitor that the work and assessments are completed by the students registered for the course | | | | | | |

| CRITERIA | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| <i>Assessment of Student Performance: A quality online learning program values student academic performance and takes a comprehensive, integrated approach to measuring student achievement. This includes use of multiple assessment measures and strategies that align closely to both program and learner objectives, with timely, relevant feedback to all stakeholders.</i> | | | | | | |
| Enables students to monitor their own learning progress | | | | | | |
| Enables teachers to adapt their instruction to meet learner needs | | | | | | |
| Uses multiple methods to assess student performance | | | | | | |
| Assesses a variety of types of student performance | | | | | | |
| Uses formative assessments to inform instructional practice | | | | | | |
| Informs ongoing course design and revisions | | | | | | |
| Measures student attainment of the course's educational goals | | | | | | |
| Provides for timely and frequent feedback about student progress | | | | | | |

Source: International Association for K-12 Online Learning¹⁹⁹

¹⁹⁹ "Online Teaching and Learning Self-Evaluation Form" contents taken verbatim, with minor adaptations, from: Pape, L. and M. Wicks. "National Standards for Quality Online Programs." International Association for K-12 Online Learning, October 2009. pp. 22, 26–28. <https://www.inacol.org/wp-content/uploads/2015/02/national-standards-for-quality-online-programs.pdf>

SUPPLEMENTAL RESOURCES AND READINGS

The tables below provide additional resources and readings teachers can reference to support their ability to plan and deliver instruction online. The first table lists hub pages for digital and open educational resources teachers can use to support teaching and learning in an online environment. The second table records supplemental materials that delve further into best practices for online instruction.

Open Educational Resource Reference Pages

| RESOURCE (with embedded hyperlink) | PUBLISHER |
|--|--|
| "14 Free K-12 Resources During Coronavirus Pandemic" ²⁰⁰ | District Administration |
| "42 Free Online Resources for Schools Shifting Online During Coronavirus" ²⁰¹ | National School Choice Week |
| "125+ Amazing Online Learning Resources" ²⁰² | We Are Teachers |
| "2020 COVID-19 Remote Learning" ²⁰³ | Indiana Department of Education |
| "Online Resources for Teachers" ²⁰⁴ | Kentucky Department of Education |
| "Online Teaching Tools and Resources" ²⁰⁵ | Center for Language Study, Yale University |
| "Resources that Support Distance Learning" ²⁰⁶ | California Department of Education |
| "Scholastic Learn at Home" ²⁰⁷ | Scholastic |

Additional Guidance on Planning and Delivering Online Instruction

| RESOURCE (with embedded hyperlink) | PUBLISHER | DESCRIPTION |
|--|--|--|
| "A National Primer on K-12 Online Learning" ²⁰⁸ | International Association for K-12 Online Learning | This resource addresses the "basics" of teaching and learning online and covers topics such as the role of the teacher, socialization between students and teachers, and student assessment. |
| "Best Practices in Teaching K-12 Online: Lessons Learned from Michigan Virtual School Teachers" ²⁰⁹ | <i>Journal of Interactive Online Learning</i> | This study highlights best practices used by virtual school teachers to support students. |
| "Best Practices: Online Pedagogy" ²¹⁰ | Harvard University | Though tailored to a postsecondary audience, this webpage provides general advice for online instruction that may be useful to K-12 educators. |

²⁰⁰ Blackburn, S. "14 Free K-12 Resources During Coronavirus Pandemic." District Administration, March 17, 2020.

<https://districtadministration.com/coronavirus-free-teaching-resources-free-education-services-covid-19/>

²⁰¹ "42 Free Online Resources for Schools Shifting Online During Coronavirus." National School Choice Week, March 13, 2020.

<https://schoolchoiceweek.com/37-free-online-resources-for-schools-shifting-online-during-coronavirus/>

²⁰² Staake, J. "125+ Amazing Online Learning Resources." We Are Teachers, March 13, 2020. <https://www.weareteachers.com/free-online-learning-resources/>

²⁰³ "2020 COVID-19 Remote Learning." Indiana Department of Education, March 18, 2020. <https://www.doe.in.gov/elearning/2020-covid-19-remote-learning>

²⁰⁴ "Online Resources for Teachers." Kentucky Department of Education. <https://education.ky.gov/school/diglrn/Documents/Internet-Digital%20Resources%20for%20Teachers.pdf>

²⁰⁵ "Online Teaching Tools and Resources," Op. cit.

²⁰⁶ "Resources That Support Distance Learning." California Department of Education, March 18, 2020.

<https://www.cde.ca.gov/ls/he/hn/appendix1.asp#six>

²⁰⁷ "Scholastic Learn at Home." Scholastic. <https://classroommagazines.scholastic.com/support/learnathome.html>

²⁰⁸ Wicks, M. "A National Primer on K-12 Online Learning." International Association for K-12 Online Learning, October 2010.

http://qa.inacol.org/wp-content/uploads/2015/02/iNCL_NationalPrimerv22010-web1.pdf

²⁰⁹ DiPietro, M. et al. "Best Practices in Teaching K-12 Online: Lessons Learned from Michigan Virtual School Teachers." *Journal of Interactive Online Learning*, 7:1, 2008. <https://www.ncolr.org/jiol/issues/pdf/7.1.2.pdf>

²¹⁰ "Best Practices: Online Pedagogy," Op. cit.

| RESOURCE (with embedded hyperlink) | PUBLISHER | DESCRIPTION |
|--|--|--|
| "Blended and Online Learning" ²¹¹ | Center for Teaching, Vanderbilt University | Though tailored to a postsecondary audience, this webpage presents an overview of research on online and blended learning and discusses effective practices instructors can use to successfully facilitate online courses. |
| "Guide to Teaching Online Courses" ²¹² | National Education Association | This guide discusses administrative considerations for developing a high-quality online learning system and describes skills and strategies to help individual teachers achieve success in online teaching formats. |
| "Identifying, Finding, and Adopting OER" ²¹³ | Lumen Learning | This webpage provides guidance on finding different types of open educational resources. |
| "Online Teaching in K–12 Models, Methods, and Best Practices for Teachers and Administrators" ²¹⁴ | Information Today, Inc. | This book provides guidance on several important aspects of online instruction such as universal design for online learning, virtual school-to-home communication, and tools and strategies for assessment in online learning formats. |
| "Teacher Guide to Online Learning" ²¹⁵ | Michigan Virtual | This guide is designed for teachers who are new to developing and delivering instruction online. Provided guidance includes items such as teaching culturally diverse students, facilitating class discussions, and meeting the needs of students with disabilities. |

²¹¹Smith and Brame, Op. cit.

²¹²"Guide to Teaching Online Courses," Op. cit.

²¹³"Identifying, Finding, and Adopting OER." Lumen Learning. <https://courses.lumenlearning.com/suny-oercommunitycourse-understandingoer/chapter/identifying-finding-and-adopting-oer/>

²¹⁴"Online Teaching in K–12 Models, Methods, and Best Practices for Teachers and Administrators." Information Today, Inc., 2016. <http://books.infotoday.com/books/Online-Teaching-in-K-12/Online-Teaching-in-K-12-Sample.pdf>

²¹⁵"Teacher Guide to Online Learning," Op. cit.

SECTION III: READING & LITERACY—ELEMENTARY & SECONDARY

In this section, Hanover presents research on and instructional strategies for reading and literacy. This information aims to support students who fall behind their peers due to summer vacation and students at the elementary and secondary levels who need additional literacy support. Additionally, this report provides specific reading programs as well as Tier 1 strategies for teachers to implement in general education classrooms.

REPORT I: ADDRESSING SUMMER LEARNING LOSS IN READING

INTRODUCTION

Researchers and educators have identified summer learning programs as an effective way to close the achievement gap. Many students, particularly low-income students, experience learning losses in reading and other skills over the summer due to non-practice. Often called the “summer slide,” these summertime learning losses mean that some students return to school in the fall even further behind their peers. This report discusses current literature on summer learning loss and the characteristics of effective summer reading programs.

LITERATURE REVIEW

This section discusses current empirical literature on the phenomenon of summer learning loss in reading and other subjects, as well as studies examining the impact of summer interventions to combat the “summer slide” in reading.

RESEARCH ON SUMMER LEARNING LOSS

Research into student learning and retention over time finds that extended periods of non-practice can lead to deterioration in student skills. In particular, a RAND Corporation review of literature on time and learning finds the following:²¹⁶

- In the absence of practice or other reinforcement, skills deteriorate over time at a rate that is initially quite rapid, with the rate of decay slowing over time.
- The rate of decay varies by task or skill. Tasks with performance that deteriorates rapidly tend to be procedural, involve a number of steps, have no performance cues, or have no time requirements. Task performance decays more slowly for tasks that are continuous, with cues or obvious internal logic.
- The best predictor of the rate of decay for a task is the individual’s original level of learning. The higher the level of proficiency before a nonpractice period, the greater the retention.
- The training method that produces the highest initial learning and performance will produce the best retention over time.
- The time needed to relearn tasks is less than the time needed to originally learn them.

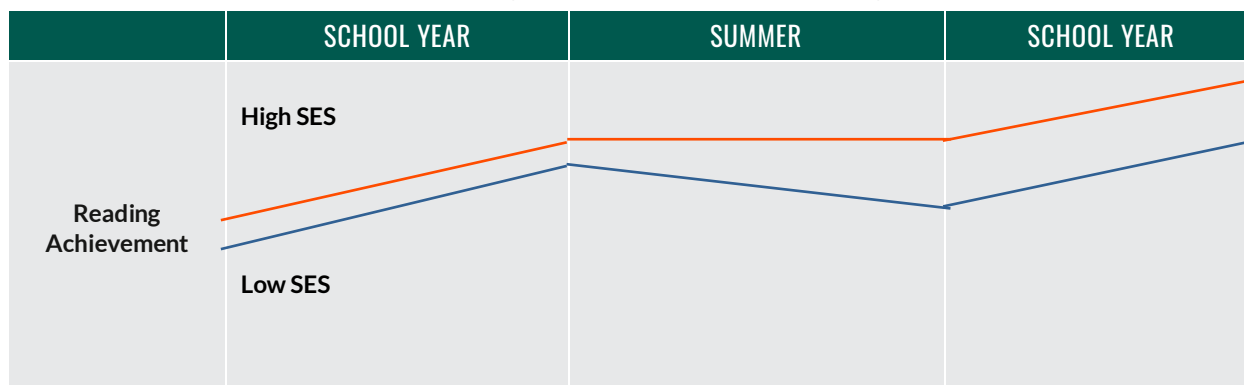
Specifically, **studies show that some students experience a deterioration in reading skills during the summer months.** A 1996 meta-analysis of research on summer learning, conducted by Cooper et al. and published in the *Review of Educational Research*, synthesized the results of 13 studies that met high standards

²¹⁶ Bulleted text taken verbatim from: McCombs, J. et al. “Making Summer Count: How Summer Programs Can Boost Children’s Learning.” RAND Corporation, 2011. pp. 17–18.
http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG1120.pdf

for sample size and methodological rigor. The researchers found that the average magnitude of the summer learning loss reported in the reviewed studies was equivalent to approximately one month of learning.²¹⁷ This finding remained positive and significant even after the researchers controlled for a common methodological weakness in the reviewed studies: the use of pre-summer and post-summer standardized test scores, which often include several weeks of in-class time.²¹⁸

In addition, the study revealed two key insights about the nature of summer learning losses. First, **children of low socio-economic status (SES) typically suffer greater summer learning losses than students from high-SES families.**²¹⁹ Researchers explain the greater summer learning loss among low-SES students using the “faucet theory.” During the school year, students from both high-SES and low-SES families have equal access to the stream of learning resources (the “resource faucet”) provided at school. During the summer months, however, low-SES students have comparatively less access to such resources.²²⁰ As low-SES children proceed through elementary school, the summer learning loss compounds, especially if low-SES students already perform at lower levels compared to their high-SES peers. In fact, some studies have found that the summer learning gap contributes to approximately two-thirds of the achievement gap between low- and high-SES students.²²¹ The figure below illustrates this phenomenon.

General Pattern of Reading Achievement for Low- and High-SES Students



Source: Collaborative Summer Library Program²²²

Second, **while all students experience some loss in math skills during the summer months, low-SES students are even more likely to experience reading skills loss.** The magnitude of math skills loss is similar across SES groups. In fact, the study found that, among all populations of students studied, math and spelling skills loss was greater than reading skills loss. The authors proposed the following explanation for the differences in learning loss among skill type:

[B]oth math computation and spelling skills involve the acquisition of factual and procedural knowledge, whereas other skill areas, especially math concepts and problem solving and reading comprehension, are more conceptually based. ... Thus, the relative lack of opportunity to practice computation and spelling over summer vacation may mean that these facts and procedural skills are most susceptible to decay.²²³

²¹⁷ Cooper, H. et al. “The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review.” *Review of Educational Research*, 1996:66, 1996. p. 227, 233.

²¹⁸ *Ibid.*, pp. 258–259.

²¹⁹ *Ibid.*, p. 255.

²²⁰ “Collaborative Summer Library Program Summer Reading White Paper.” Collaborative Summer Library Program, December 2014. p. 8. <http://www.csllpreads.org/wp-content/uploads/2014/10/CSLP-Summer-Reading-White-Paper-2015.pdf>

²²¹ *Ibid.*, p. 7.

²²² *Ibid.*, p. 8.

²²³ Cooper et al., “The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review,” *Op. cit.*, p. 260.

Reading skills loss, by comparison, was moderated by family SES status: the reading and language achievement of middle-class students remained steady over the summer, while low-income students experienced significant losses. On average, the authors calculated, “summer vacations created a gap of about three months between middle- and lower-class students.”²²⁴ This finding has been replicated in later studies.²²⁵

Additional studies have explored how low-SES students’ summer learning experiences contribute to such significant losses. For example, a 2001 study mapped the ecology of students’ home and neighborhood environments, where students spend most of their summertime. The three-year study, published in *Reading Research Quarterly*, found that in low-SES neighborhoods, stores, libraries, and childcare facilities had fewer books when compared to high-SES neighborhoods. Low-SES parents were less likely to take their children to a library in the summer months.²²⁶ Perhaps the most interesting finding of the study was that low-SES neighborhoods had less “visually distinctive environmental print,” such as product labels, restaurant signs, and street signs, for children to read during the course of their day.²²⁷

Gender does not appear to have a significant impact on summer learning loss, while student grade level may have a small moderating effect. The Cooper et. al. study found no significant difference in learning loss between male and female students, or between students of different racial and ethnic backgrounds. However, the meta-analysis also found that summer learning losses were greater among students in Grades 4 and above, when compared to students in Grades 1 and 2.²²⁸

RESEARCH ON SUMMER READING PROGRAMS

Researchers have evaluated the impact of several classroom-based summer reading programs using a variety of quantitative and qualitative methods. By comparison, empirical study of non-classroom summer reading programs, such as home-based programs and library-based programs, is underdeveloped and inconclusive. However, initial research into non-classroom programs indicates that like classroom-based programs, they may have a positive impact on student learning.²²⁹

CLASSROOM-BASED PROGRAMS

Classroom-based programs – especially programs of longer duration that encourage parent involvement – can reduce summer learning loss. A 2005 meta-analysis of studies on out-of-school programs – including afterschool and summer programs – found that these interventions generally have a small but significantly positive impact on reading achievement. However, the study, published in the *Review of Educational Research*, found that certain program characteristics can affect whether or not program participation improves student learning and skills retention. For example, the study found that only programs that lasted between 44 and 210 hours had positive effects. For all other program lengths, the effect was not statistically significant from zero. In addition, students who participated in one-on-one tutoring experienced the largest effect, while large group and small group (fewer than 10 students) arrangements had no effect.²³⁰

Additional studies that focus specifically on summer interventions also found positive effects. A 2009 meta-analysis of 93 studies, published by the Society for Research in Child Development (SRCD), found that

²²⁴ Ibid., p. 261.

²²⁵ See the discussion of Benson and Borman’s 2010 study in: “Collaborative Summer Library Program Summer Reading White Paper,” Op. cit., pp. 7–8.

²²⁶ Neuman, S. and D. Celano. “Access to Print in Low-Income and Middle-Income Communities: An Ecological Study of Four Neighborhoods.” *Reading Research Quarterly*, 36:1, 2001. Accessed via EbscoHost

²²⁷ Ibid., p. 17.

²²⁸ [1] Cooper et al., “The Effects of Summer Vacation on Achievement Test Scores: A Narrative and Meta-Analytic Review,” Op. cit., pp. 262–263.

[2] “Collaborative Summer Library Program Summer Reading White Paper,” Op. cit., pp. 11–12.

²²⁹ “Collaborative Summer Library Program Summer Reading White Paper,” Op. cit., p. 25.

²³⁰ Lauer, P. et al. “Out-of-School-Time Programs: A Meta-Analysis of Effects for At-Risk Students.” *Review of Educational Research*, 76:2, Summer 2006. p. 295. Accessed via ProQuest.

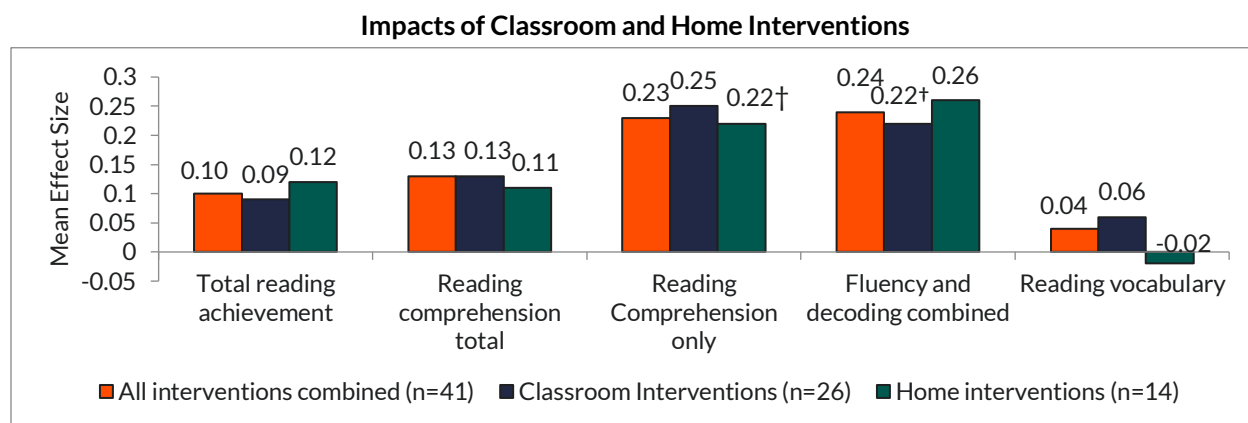
remedial summer school programs have greater impact on middle-income students than more disadvantaged students. However, programs that required parent involvement had higher impacts on student learning. Like prior studies, the SRCD analysis found that program duration had curvilinear relationship with student outcomes. Specifically, the study found that programs with the greatest effect sizes offered between 60 and 120 hours of instruction.²³¹

HOME-BASED PROGRAMS

Home-based interventions may also have a positive impact on student learning and skills retention. Many districts turn to home-based interventions, such as reading initiatives and book give-away programs, as a cost-effective alternative to classroom-based programs and summer school.²³² In addition, home-based interventions often serve a different objective. For example, a white paper prepared for the Collaborative Summer Library Program explains that home-based programs frequently aim to increase students' access and exposure to print, rather than provide instruction in a specific subject:

While classroom-based programs typically are geared towards remediating academic weaknesses via teacher-led instructional activities, home-based programs are usually designed to improve reading comprehension by providing access to reading materials and promoting intrinsic motivation to read. Home-based programs focus on child-initiated book reading and often include parental or teacher support.²³³

A 2013 meta-analysis by Kim and Quinn compared the impact of classroom-based and home-based interventions. The study, published in the *Review of Educational Research*, found that both types of interventions have similar, moderately positive effects on student reading skills, including comprehension, fluency, and decoding.²³⁴ As shown in the figure below, the greatest effects were seen in student reading comprehension and fluency and decoding (a subset of reading comprehension). The study also found significant variations in impact based on students' income background. Overall, the effects were 0.28 standard deviations higher for low-SES students when compared to students of mixed-SES backgrounds.²³⁵



Source: *Review of Educational Research*²³⁶

²³¹ Cooper, H. et al. "Making the Most of Summer School: A Meta-Analytic and Narrative Review." *Monographs of the Society for Research in Child Development*, 65, 2000. <http://www.ncbi.nlm.nih.gov/pubmed/12467098> As described in: "Collaborative Summer Library Program Summer Reading White Paper," Op. cit., p. 19.

²³² Kim, J. and D. Quinn. "The Effects of Summer Reading on Low-Income Children's Literacy Achievement From Kindergarten to Grade 8: A Meta-Analysis of Classroom and Home Interventions." *Review of Educational Research*, 83:3, 2013. p. 3. http://scholar.harvard.edu/files/dmq/files/kim-quinn-summer_reading_meta-analysis-rer-2013.pdf

²³³ "Collaborative Summer Library Program Summer Reading White Paper," Op. cit., p. 21.

²³⁴ Kim and Quinn, Op. cit., p. 20.

²³⁵ Ibid., pp. 27–28.

²³⁶ Ibid., p. 67.

Some home-based programs feature limited involvement by trained teachers. For example, a 2014 study examined the effects of two types of teacher-scaffolded home reading initiatives involving more than 1,400 Virginia students in Grades K-5. In particular, the program:²³⁷

- Provided books matched to students' reading levels, materials sent home, and end-of-year comprehension lessons; and
- Included teacher calls to students during the summer, in addition to matched books, materials, and end-of-year lessons as described above).

The study found that, overall, students who received the two interventions did not show significant improvement in reading comprehension scores on the Iowa Tests of Basic Skills (ITBS) compared to students who did not receive either intervention. However, both interventions were moderately positive in high-poverty schools.²³⁸

In addition, a 2014 study examined the role of parent involvement in home-based interventions. The study, published in *School Psychology Review*, evaluated the impact of the Helping Early Literacy with Practice Strategies (HELPS) Program, which trained parents to implement eight evidence-based strategies to improve their child's reading during the summer.²³⁹ At the end of the study period, students showed improved performance on four separate measures of reading skills, including the Test of Word Reading Efficiency (TOWRE) and the Gray Oral Reading Test.²⁴⁰ While the generalizability of these results is limited by the study's quasi-experimental design (parents self-selected to participate, rather than be randomly assigned) it does provide an initial research base for a parent-led home intervention model.

LIBRARY-BASED INTERVENTIONS

Library-based literacy initiatives, in which local libraries promote summer reading among children and adults, can be found across the country.²⁴¹ A 2010 study published by researchers at Dominican University examined participation and outcomes of 11 summer library programs across the country, and offers initial insights into the impact of library programs. Each program lasted at least six weeks, using a curriculum of the library's choosing. Unlike many school-based programs, participation in library programs was voluntary. The researchers measured the impact of the programs using the Scholastic Reading Inventory (SRI), administered at the start and end of the summer, as well as surveys of students, parents, librarians, and teachers.²⁴²

In total, 367 elementary students, 110 parents, 51 Grade 4 teachers, and 20 librarians provided information for the study.²⁴³ The study found that students who participated in the summer library programs scored higher on reading tests in the fall and displayed greater interest in reading during the summer. In addition, teachers reported that participating students appeared to be more ready to learn in the fall than non-participating students.²⁴⁴ The following figure presents detailed results of the Dominican Study.

²³⁷ Bulleted points adapted from: White, T. et al. "Replicating the Effects of a Teacher-Scaffolded Voluntary Summer Reading Program: The Role of Poverty." *Reading Research Quarterly*, 49:1, 2014. p. 4. http://scholar.harvard.edu/files/jameskim/files/y1_reads-rrq-manuscript.pdf

²³⁸ The reported effect size for high poverty skills was between .08 and .11. *Ibid.*, p. 2.

²³⁹ Mitchell, C. and J. Begeny. "Improving Student Reading through Parents' Implementation of a Structured Reading Program." *School Psychology Review*, 43:1, 2014. p. 44. Accessed via ProQuest

²⁴⁰ *Ibid.*, pp. 49–50.

²⁴¹ For example, see: "About." Collaborative Summer Library Program. <http://www.cslpreads.org/about/>

²⁴² Roman, S., D. Carran, and C. Fiore. "The Dominican Study: Public Library Summer Reading Programs Close the Reading Gap." Dominican University, June 2010. p. 22. http://gslis.dom.edu/sites/default/files/documents/IMLS_finalReport.pdf

²⁴³ *Ibid.*, p. 21.

²⁴⁴ *Ibid.*, pp. 1–2.

Impact of Library-Based Reading Programs

| AREA | IMPACT |
|--------------------|---|
| Reading Scores | <ul style="list-style-type: none"> Participating students scored higher on reading achievement tests at the beginning of the next school year than those students who did not participate, and they gained in other ways as well. Non-participating students also improved reading scores but they did not reach the reading level of participating students. Participating students had better reading skills at the end of third grade and scored higher on the standards test than non-participating students. |
| Summer Reading | <ul style="list-style-type: none"> Participating students reported that they like to read books, like to go to the library, and picked their own books to read. Parents of participating students reported that their children spent more time reading over the summer and read more books, were well prepared for school in the fall, and read more confidently. Parents of participating students reported that they would enroll their children in a summer reading program at the library again, made more visits to the public library with their children, and read more books to/with their children over the summer. |
| Readiness to Learn | <ul style="list-style-type: none"> Teachers, school librarians, and public librarians observed participating students returned to school ready to learn, improved their reading achievement and skills, increased their enjoyment of reading, were more motivated to read, were more confident in participating in classroom reading activities, read beyond what was required in their free time, and perceived reading to be important. Public librarians observed/perceived that participating students were enthusiastic about reading and self-selecting books, and increased their fluency and comprehension. |

Source: Dominican University²⁴⁵

Evaluations of other summer library programs have also produced positive results.²⁴⁶ While the results of the Dominican Study are promising, the also revealed that low-SES students are less likely to participate in voluntary summer library programs. In particular, the study found that student participants included more females, Caucasians, and high-SES students than students who did not participate. Participating students were more likely to have access to books at home than students who did not participate.²⁴⁷

BEST PRACTICES IN SUMMER READING PROGRAMS

This section presents best practices in the design and implementation of a summer reading program, as described in the empirical literature and guides published by education organizations.

CHARACTERISTICS OF EFFECTIVE PROGRAMS

Researchers and educators have identified several characteristics of effective summer learning programs. Such characteristics include commonly-cited best practices in education, such as small class sizes, use of certified teachers, use of an aligned, standards-based curriculum, and differentiated instruction.²⁴⁸

For example, the Georgia Governor's Office of Student Achievement published an extensive "How-to Guide" for school districts that listed nine evidence-based characteristics of effective summer learning programs.

²⁴⁵ Figure text adapted from: Ibid.

²⁴⁶ [1] "Collaborative Summer Library Program Summer Reading White Paper," Op. cit., pp. 28–30.

[2] Roman, Carran, and Fiore, Op. cit., pp. 16–17.

²⁴⁷ Roman, Carran, and Fiore, Op. cit., p. 2.

²⁴⁸ Terzian, M. and K. Moore. "What Works for Summer Learning Programs for Low-Income Children and Youth: Preliminary Lessons from Experimental Evaluations of Social Interventions." Child Trends, September 2009. pp. 3–4.
<http://www.wallacefoundation.org/knowledge-center/summer-and-extended-learning-time/summer-learning/Documents/Effective-and-Promising-Summer-Learning-Programs-Fact-Sheet.pdf>

While the guide is designed for districts that seek to implement classroom-based programs, educators may find its recommendations applicable to other program types as well. In particular, the guide notes that effective summer learning programs feature incentives to reduce barriers to participation and efforts to involve parents in the summer learning process.²⁴⁹ The figure below lists the nine characteristics in detail.

Characteristics of Effective Summer Learning Programs

- **Small class sizes.** Summer learning programs with no more than 20 students per class are effective in contributing to positive student outcomes.
- **Differentiated instruction.** Summer learning programs provide opportunities to provide small-group and one-on-one instruction.
- **High-quality.** School districts should provide professional development and coaching to instructors.
- **Aligned summer and school year curriculum.** Districts should avoid replicating instruction given during the regular school term if regular instruction lacks targeted interventions for struggling learners or does not offer a systematic approach for addressing potential early reading failures.
- **Comprehensive and engaging programming.** School districts should build relationships with community partners and potential contributors to provide students with engaging and enriching learning opportunities beyond remediation.
- **Encouragement of participation and high participation rates.** To encourage participation and high attendance rates, districts should anticipate barriers to attendance and incentivize it, such as by providing transportation, full-day programming, and engaging activities along with academic content.
- **Appropriate duration of the program.** Research does not offer an ideal amount of time students need to engage with summer learning to yield gains. Recommendations range from a minimum of 80 hours to 360 hours.
- **Parent involvement.** Parents are more likely to reinforce practices if they are aware of the content and are given tools to do so.
- **Effective evaluation.** Evaluation is often a low priority activity, but it can be used to strengthen program quality.

Source: Georgia Governor's Office of Student Achievement.²⁵⁰

LIBRARY-BASED PROGRAMS

Experts encourage libraries and schools to work together in designing summer reading programs. Teachers can help identify struggling readers and refer those students to summer reading programs. In addition, teachers can also provide instructional support and help ensure that the summer program aligns with the school-year curriculum.²⁵¹ Collaboration in planning instructional strategies may be particularly important, as libraries and other community-based partners may not be able to employ certified teachers for the duration of the program.

The Oregon State Library published a research brief listing components of effective library-based reading programs. In particular, the brief encourages libraries to engage students and their families by promoting diverse content and targeting English language learners. In addition, library programs should develop opportunities for students to discuss books they are reading and create projects based on books. Story times can be particularly effective for children who are not read to frequently at home. Finally, library programs should encourage students to read outside of the library by giving away free books and giving students library cards.²⁵²

²⁴⁹ "Mission Possible: Summer Learning for Struggling Readers." Georgia Governor's Office of Student Achievement. pp. 7–8. https://gosa.georgia.gov/sites/gosa.georgia.gov/files/related_files/site_page/Mission%20Possible-%20Summer%20Learning%20for%20Struggling%20Readers.pdf

²⁵⁰ Figure content adapted from: Ibid.

²⁵¹ "Components of High-Quality Summer Reading Programs." Oregon State Library and Oregon Library Association, December 2011. p. 2. https://orysbestpractices.files.wordpress.com/2011/12/components_final2.pdf

²⁵² Ibid.

CHARACTERISTICS OF EFFECTIVE LITERACY INSTRUCTION

RESEARCH-BASED INSTRUCTION

The 2013 Kim and Quinn meta-analysis of summer literacy interventions found that research-based classroom interventions have a greater impact on student learning than interventions that do not use research-based instruction.²⁵³ The authors defined “research-based” using the recommended practices identified by the National Reading Panel in 2000. The following figure presents those recommended practices.

Research-Based Literacy Instruction

- **Phonemic awareness:** Instructors (a) teach students to manipulate phonemes with letters, (b) focus on one or two types of manipulations at a time, (c) teach in small groups.
- **Phonics:** Instructors (a) teach phonics systematically, (b) use the analogy method, (c) use the analytic method, (d) use embedded methods, (e) use the synthetic method.
- **Fluency:** Instructors teach guided repeated oral reading strategies.
- **Comprehension:** Instructors (a) relate readings to students’ prior experiences, (b) help students create mental representations, (c) explicitly model strategies for students, (d) teach multiple strategies, (e) teach comprehension monitoring, (f) employ graphic organizers, (g) teach question-generation, (h) teach question-answering, (i) teach story structure, or (j) teach summarizing.
- **Vocabulary:** Instructors employ (a) multiple methods, (b) direct and indirect methods, (c) restructuring, (d) word substitution, (e) graphic organizers, (f) analogies, (g) pictures, or (h) sentence-generation.

Source: *Review of Educational Research*²⁵⁴

INDEPENDENT READING

Many summer reading programs, particularly home-based and library-based programs, are designed to encourage students to read independently throughout the summer months. Independent reading is a reflection of personal choice and motivation to read, and has been found to improve student reading comprehension, verbal fluency, and vocabulary.²⁵⁵ In order to encourage independent summer reading, experts recommend that summer reading programs include the following elements:

- **Appropriately complex materials:** Texts should be complex enough to encourage growth, but not so difficult that they dissuade a student from reading. Contrary to the “one-size-fits-all” approach common throughout the school year, effective summer programs maintain texts at multiple levels, in order to match texts to individual student reading skills.²⁵⁶
- **Reading aloud to students:** When teachers, parents, and caregivers read texts aloud to children, they “[incorporate] variations in pitch, tone, pace, volume, pauses, eye contact, questions, and comments to produce a fluent and enjoyable delivery.”²⁵⁷

²⁵³ Kim and Quinn, Op. cit., p. 34.

²⁵⁴ [1] Figure text adapted from: Ibid., p. 43.

[2] See also: “Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction.” National Reading Panel, 2000.
<https://www.nichd.nih.gov/publications/pubs/nrp/documents/report.pdf>

²⁵⁵ Cullinan, B. “Independent Reading and School Achievement.” *School Library Media Research*, 3, November 2000. p. 3.
http://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol3/SLMR_IndependentReading_V3.pdf

²⁵⁶ Allington, R. “The Six Ts of Effective Elementary Literacy Instruction.” *Reading Rockets*, June 2002.
<http://www.readingrockets.org/article/six-ts-effective-elementary-literacy-instruction>

²⁵⁷ Morrison, V. and L. Wheeler. “Revisiting Read-Aloud: Instructional Strategies That Encourage Students’ Engagement with Text.” *Read*. <http://www.readingrockets.org/article/revisiting-read-aloud-instructional-strategies-encourage-students-engagement-text>

- **Model effective reading techniques:** Adults should model thinking while reading, self-monitoring for understanding, and summarizing while reading.²⁵⁸ Modelling can be used to support readers at all levels.²⁵⁹
- **One-on-one tutoring:** Effective programs recruit high-school students, college students, retirees, and other members of the community to read one-on-one with students. In addition, literacy tutoring can include vocabulary reviews and writing stories together.²⁶⁰

SPEAKING AND WRITING

Experts argue that literacy is a skill made up of multiple components, including skills related to speaking and writing. Annenberg Learner, a teacher professional development and classroom resources provider, identifies 11 “essential components” of literacy development, listed below in order of development.²⁶¹

- | | |
|----------------------|--------------------------|
| ■ Oral language | ■ Phonological awareness |
| ■ Phonemic awareness | ■ Word study |
| ■ Phonics | ■ Word identification |
| ■ Composition | ■ Comprehension |
| ■ Vocabulary | ■ Fluency |
| ■ Automaticity | |

As a result, students do not improve literacy skills simply by increasing reading time. Notably, the foundational elements of literacy achievement, oral language and phonological awareness, relate closer to audio tasks than reading tasks, and several elements—such as word study, word identification, and composition—relate closely to writing ability. As such, while a focus on reading in literacy instruction is appropriate, effective literacy programs will also emphasize speaking and writing development.

To build student’s speaking skills, **experts recommend that literacy programs include frequent, guided discussions of reading content.** Facilitated group discussions provide teachers and adults opportunities to model effective reading and listening strategies. Researchers emphasize that appropriate and effective discussions focus on problem-solving related to relevant content, and are more conversational, rather than interrogational, in nature.²⁶²

In addition, **journaling can be an effective strategy for improving reading comprehension, vocabulary, and writing skills.** Educators describe journaling as a safe and comfortable way for young students to practice their writing and reading comprehension skills. In addition, journaling helps students develop personal relationships with texts, thus enhancing their intrinsic motivation to continue reading.²⁶³

PARENT INVOLVEMENT

Parent involvement is a critical component of summer reading programs, particularly home-based and library-based programs. The Georgia Governor’s Office of Student Achievement emphasizes that summer

²⁵⁸ Allington, “The Six Ts of Effective Elementary Literacy Instruction,” Op. cit.

²⁵⁹ Cullinan, Op. cit.

²⁶⁰ Power, M. and K. Cummings. “The Effectiveness of One-on-One Tutoring in Elementary Reading.” Washington Educational Research Association, March 14, 2011. p. 2. http://www.wera-web.org/activities/WERA_Winter11/2.8%20Final%20Read%202%20Me%20Research%20Report%204-28-2011.pdf

²⁶¹ “Essential Components of Literacy Development.” Annenberg Learner. <http://www.learner.org/libraries/readingk2/front/components.html>

²⁶² Allington, “The Six Ts of Effective Elementary Literacy Instruction,” Op. cit.

²⁶³ Hopkins, G. “Journal Writing Every Day: A Painless Way to Develop Skills.” Education World, 2010. http://www.educationworld.com/a_curr/curr144.shtml

learning programs should “communicate with parents early and often.”²⁶⁴ In addition, programs should identify parent leaders who can facilitate communication through their own social networks. Parents may also provide valuable input about program design, such as scheduling and resource needs.²⁶⁵ The figure below outlines additional strategies for family engagement, as described by the International Reading Association.

Successful Strategies for Family Engagement

- Establish a sense of community.
- Encourage teachers to communicate with their students’ parents.
- Do have ongoing and varied communication.
- Offer literacy instruction to families, broadly defined to include parents, guardians, siblings, and younger children.
- Create strategic recruitment plans, using multiple methods of dissemination.
- Include strong participant input whenever possible.
- Emphasize attendance and retention through creative scheduling and responding to transportation or child-care needs using district resources or public-private partnerships.
- Create a supportive environment where 100% student attendance is recognized and celebrated.
- Provide opportunities for family and social networks to form through parent engagement events and take-home assignments.

Source: Georgia Governor’s Office of Student Achievement²⁶⁶

EVALUATION AND METRICS

Districts conduct evaluations of their summer reading programs to ensure proper implementation, facilitate continuous improvement of services, and measure the program’s impact on student outcomes. While the design and scope of program evaluations may vary according to the resources and objectives of the program, experts outline general best practices, discussed below, to guide the assessment of any evaluation process.

EVALUATION PROCESS

Program evaluations should cover program inputs and fidelity of implementation, in addition to student outcomes. While student learning may be the primary objective of a summer learning program, the evaluation process is an opportunity to gather data on how the program impacts student learning. To that end, many education experts recommend the comprehensive Orr’s Evaluation model.²⁶⁷ The figure below illustrates the Orr’s Evaluation Model, as adapted for summer reading program evaluations, as well as sample metrics that may be included in a summer reading program evaluation.

Orr’s Evaluation Model

| Resources | Capability | Utilization | Impact or Effect |
|--|--|---|---|
| <ul style="list-style-type: none"> • Input measures • Budget • Staff • Materials • Facilities | <ul style="list-style-type: none"> • Process measures • Communication goals • Program goals | <ul style="list-style-type: none"> • Output measures • Attendance • Book checkouts • Time spent reading • Pages read | <ul style="list-style-type: none"> • Outcomes • Skill level • Attitudes • Behavior • Knowledge |

Source: *Public Libraries*²⁶⁸

²⁶⁴ “Mission Possible: Summer Learning for Struggling Readers,” Op. cit., p. 32.

²⁶⁵ Ibid.

²⁶⁶ Figure text taken verbatim from: Ibid., p. 33.

²⁶⁷ Matthews, J. “Evaluating Summer Reading Programs: Suggested Improvements.” *Public Libraries*, May 2013.

<http://publiclibrariesonline.org/2013/05/evaluating-summer-reading-programs-suggested-improvements/>

²⁶⁸ Ibid.

Program evaluators must be aware of how the evaluation design may limit the validity of the data they collect. Experimental designs, which control for external factors by randomly assigning some participants to control and treatment groups, often produce the strongest results. Such complex designs often require significant investments of time and financial resources, as well as a large student population to enable comparison. However, simple before and after comparisons and case studies may also yield valuable insights about the impact of the program on student achievement.²⁶⁹

EVALUATION INSTRUMENTS

To determine which evaluation metrics to use, researchers recommend that school officials first determine which questions they seek to answer through the evaluation. The evaluation questions will then determine which type of data collection instrument and metrics to use. For example, a summer reading program evaluation may seek to answer the question “How has the students’ reading test scores improved from pre-program to now?” using a reading test administered pre- and post-program.²⁷⁰ Questions about parent satisfaction may be answered through surveys, focus groups, and interviews.²⁷¹ Data about instructional strategies and student behavior may be collected during discrete classroom observations.²⁷² The figure below lists additional sources of data that may be used to evaluate a summer reading program.

Evaluation Data Sources

| DIRECT OBSERVATION | RECORDS AND DOCUMENTS |
|--|--|
| <ul style="list-style-type: none"> Classroom activity Use of materials and technology Physical objects (books, etc.) in classrooms or homes Behavior | <ul style="list-style-type: none"> Planning reports Classroom syllabi, lesson plans Student grades Daily or weekly logs of reading activities Enrollment reports Library records Test results |
| PHYSICAL ARTIFACTS | INFORMATION FROM TEACHERS, PARENTS, AND STUDENTS |
| <ul style="list-style-type: none"> Student products Technology and materials | <ul style="list-style-type: none"> Surveys Interviews |

Source: American Institutes for Research²⁷³

To further understand how researchers evaluate summer reading programs and the specific metrics used, Hanover Research reviewed six recent evaluations of summer reading programs, including classroom-, library-, and home-based programs.²⁷⁴ The analysis revealed that in many cases, researchers use a

²⁶⁹ Paulsen, C. and D. Dailey. “A Guide for Education Personnel: Evaluating a Program or Intervention.” American Institutes for Research, September 27, 2002. pp. 10–11. http://www.air.org/sites/default/files/downloads/report/eval_0.pdf

²⁷⁰ Ibid., pp. 14–15.

²⁷¹ For example, see the sample survey and focus group protocols from the California Library Association: “Outcomes-Based Summer Reading: Survey and Focus Group Resources.” California Library Association. <http://www.cla-net.org/?page=84>

²⁷² Paulsen and Dailey, Op. cit., pp. 14–15.

²⁷³ Ibid., pp. 12–13.

²⁷⁴ [1] Chaplin, D. and J. Capizzano. “Impacts of a Summer Learning Program: A Random Assignment Study of Building Educated Leaders for Life (BELL).” The Urban Institute, August 2006. <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/411350-Impacts-of-a-Summer-Learning-Program.PDF>

[2] “A Profile of the Evaluation of Read to Achieve Summer Literacy Day Camp.” Harvard Family Research Project, 2003. <http://www.hfrp.org/out-of-school-time/ost-database-bibliography/database/read-to-achieve-summer-literacy-day-camp>

[3] Roman, Carran, and Fiore, Op. cit.

[4] “Evaluation of the Public Library Summer Reading Program: Final Report.” Evaluation and Training Institute, December 2001. <http://www.colapublib.org/eDocuments/EvalSRP-2001.pdf>

[5] “Evaluation of Summer 2010 Out-of-School Time Literacy and Learning.” Massachusetts Department of Early Education and Care, February 2011. http://www.eec.state.ma.us/docs1/Final_OST_Evaluation_2_4_11.pdf

combination of qualitative and quantitative methods to evaluate the impact of the program. In particular, several evaluations feature pre- and post-testing of student reading skills using research-based reading assessments, including:

- Gates-MacGinitie Reading Test (GMRT)
- Scholastic Reading Inventory (SRI)
- Dynamic Indicators of Basic Early Learning Skills (DIBELS)
- Stanford Achievement Test (SAT)
- Wechsler Individual Achievement Test (WIAT)
- Gray Oral Reading Test (GORT)
- Test of Word Reading Efficiency (TOWRE)

The evaluations augment the quantitative data generated by the reading assessments with parent and teacher interviews, surveys, and even de-briefing sessions.

EVALUATION METRICS

All six reviewed evaluations collected basic data on student demographics, program characteristics, and an indicator of student reading skill (e.g., SRI or DIBELS), but varied in the extent to which they probed these subjects. For example, one evaluation collected data on the students' home environments, while another evaluation focused on participants' perceptions of the program.²⁷⁵ In total, the survey instruments and data collection forms used in the six reviewed studies reveals dozens of possible program metrics, including:

- **Child demographic data:** age, school, race/ethnicity, and SES status.
- **Child home environment:** child's daytime activities in summer, child's behavior, television viewing habits, eating dinner as family, home reading time, and visits to library.²⁷⁶
- **Program staff:** number of staff, years of experience, grade-level expertise, and program-specific/literacy training.²⁷⁷
- **Program characteristics:** class size, attendance, activities offered, and books offered.²⁷⁸
- **Impact of specific program characteristics:** most valuable program activities, and which activities the children liked best.²⁷⁹
- **Student attitudes and habits related to reading:** whether students like to read, like to go to the library, if they remember what they read later, and if they pick out their own books.²⁸⁰
- **Teacher perceptions of student reading:** observed student performance in key areas of reading, whether or not the student is reading at grade level, and student enthusiasm for reading.²⁸¹
- **Parent involvement:** number of hours spent reading with child, attendance, impact of awards/incentives offered by the program, and possibility of consistent future involvement.²⁸²

[6] Mitchell and Begeny, Op. cit.

²⁷⁵ [1] Chaplin and Capizzano, Op. cit., p. 60.

[2] "Evaluation of Summer 2010 Out-of-School Time Literacy and Learning," Op. cit.

²⁷⁶ Chaplin and Capizzano, Op. cit., p. 60.

²⁷⁷ "Evaluation of Summer 2010 Out-of-School Time Literacy and Learning," Op. cit., p. 46.

²⁷⁸ Ibid., p. 15.

²⁷⁹ Ibid., p. 47.

²⁸⁰ Roman, Carran, and Fiore, Op. cit., p. 28.

²⁸¹ "Evaluation of the Public Library Summer Reading Program: Final Report," Op. cit., p. 28.

²⁸² Ibid., p. 5.

- **Parent perceptions of the program:** opinion of program acceptability, if parent would recommend the program to another parent, if the child experienced negative side-effects, and whether stories were appropriate for child's reading level.²⁸³
- **Post-program reflection:** biggest challenges, lessons learned, how the experience changed relationships with program personnel, and recommendations for the future.²⁸⁴

SUMMER READING PROGRAM PROFILES

This section profiles four innovative summer reading programs. In particular, all four of the following programs are library- and home-based programs, rather than classroom-based programs or summer school:

- **One Jackson, Many Readers**, a district-library partnership in Jackson, Mississippi is an example of an effective library program.
- **Hoosier Family of Readers**, run by the Indiana Department of Education, demonstrates how educators can take advantage of technology and online resources to encourage learning.
- **Harvard's READS for Summer Learning** is an intensive program that features scaffolded support from teachers and parents.
- **Chicago's Summer Learning Challenge** partners with science-focused community organizations to integrate STEAM learning into summer reading.

ONE JACKSON, MANY READERS

The Jackson Public Schools (JPS) incentivized summer reading program, "One Jackson, Many Readers," encourages students to read age-appropriate books during the summer months and write about them. Each summer, all students in the district are required to read at least three books. One of those books must be the required book for the student's grade level. The list of required books includes Bill Martin Jr.'s *Brown Bear, Brown Bear, What Do You See?* at the kindergarten level and Maya Angelou's *I Know Why the Caged Bird Sings* in Grade 11.²⁸⁵ The district lists additional required books for students in advanced academic programs, such as Advanced Placement (AP) and International Baccalaureate (IB).²⁸⁶

JPS requires students to maintain a reading log of titles they read and their reaction to the book. Specifically, the district encourages students to write about the main characters in the book, what they learned from reading the book, and how the story can relate to their own experience.²⁸⁷ When students return to school in the fall, their teacher may require them to complete a project or written exam on their grade level's required text.²⁸⁸

INCENTIVES

Schools organize a "reading celebration" in the fall for all students who read and log the minimum requirement of three books. In addition, the district offers rewards to students who read more than three books. For example, elementary students who read and log more than 20 books may attend a celebration at the Mississippi Children's Museum in September. Elementary-level students who read more than 40 books are entered into a drawing to win an e-reader.²⁸⁹

²⁸³ Mitchell and Begeny, Op. cit., p. 53.

²⁸⁴ "Evaluation of Summer 2010 Out-of-School Time Literacy and Learning," Op. cit., p. 47.

²⁸⁵ "Summer Reading Program." Jackson Public Schools.

<http://www.jackson.k12.ms.us/content.aspx?url=/page/summerreadingprogram>

²⁸⁶ Ibid.

²⁸⁷ "2015 Summer Reading - Grades 6-12." Jackson Public Schools, 2015. p. 9.

http://www.jackson.k12.ms.us/schools/summer_reading/summer_reading_guide_6-12.pdf

²⁸⁸ Ibid., p. 7.

²⁸⁹ Ibid., p. 8.

COMMUNITY ENGAGEMENT

The “One Jackson, Many Readers” program encourages parents and other adults to read to students and discuss books that they are reading.²⁹⁰ At the beginning of each summer, the program conducts parent orientation sessions to teach parents techniques and strategies to support their child’s reading and writing skills.²⁹¹

In addition, the program partners with multiple community organizations to promote reading and provide students access to books. Such community partners include:²⁹²

- City of Jackson
- Jackson-Hinds Library System
- Jackson Zoo
- Lemuria Bookstore
- Mississippi Children’s Museum
- Mississippi Public Broadcasting
- Parents for Public Schools of Jackson
- United Way of the Capital Area

JPS also encourages students to enroll in their local public library’s summer reading program. Books read for the library-based reading program may count towards “One Jackson, Many Readers” as well.²⁹³

HOOSIER FAMILY OF READERS

The Indiana DOE’s online summer reading program, “Hoosier Family of Readers,” offers Indiana students access to more than 5,000 digital books.²⁹⁴ Launched in 2013, the program encourages “families of readers” to read together for at least 20 minutes per day. A “family” of readers is any combination of people that reads, including independent readers.²⁹⁵

ONLINE READING

Through a partnership with the digital library MyOn, the Indiana DOE links students to thousands of chapter books and non-fiction books. The collection includes Spanish-language and dual-language books, as well as hi-lo books (highly interesting books written at a low level).²⁹⁶ MyOn titles feature several media supports, such as professionally recorded audio, text highlighting, and an embedded dictionary.²⁹⁷ In addition to unrestricted 24/7 online access to books, students may download up to 20 titles to read on their personal computer, tablet, or other device.²⁹⁸

During Summer 2015, students and families read 45,352 books through MyOn. In 2016, the Indiana DOE has set an ambitious goal linked to an upcoming state milestone: this year, the department encourages students and families to read 200,000 books in honor of the Indiana’s 200th anniversary.

READS FOR SUMMER LEARNING

²⁹⁰ Ibid., p. 14.

²⁹¹ “Parents Inspiring Parents to Encourage a Culture of Reading.” Parents for Public Schools of Jackson. <http://www.ppsjackson.org/?/updates/story/parents-inspiring-parents-to-encourage-the-culture-of-reading>

²⁹² Bulleted text taken verbatim from: “About One Jackson Many Readers.” Jackson Public Schools. <http://www.jackson.k12.ms.us/content.aspx?url=/page/ojmr>

²⁹³ “2015 Summer Reading - Grades 6-12,” Op. cit., p. 7.

²⁹⁴ Ritz, G. “Introduction Letter to Families.” Indiana Department of Education, June 2014. <http://www.msdt.k12.in.us/wp-content/uploads/2014/06/myON-Family-Letter-Hoosier-Family-of-Readers.pdf>

²⁹⁵ “IDOE 2015 Literacy Initiative.” Indiana Department of Education. <http://www.doe.in.gov/hoosierreaders/idoe-2015-literacy-initiative>

²⁹⁶ “Unprecedented Access to Thousands of Books.” Indiana Department of Education. <http://www.doe.in.gov/hoosierreaders/myon-books>

²⁹⁷ Ritz, Op. cit.

²⁹⁸ “Unprecedented Access to Thousands of Books,” Op. cit.

The READS for Summer Learning Program is a federally-funded, teacher-scaffolded summer literacy program run by the Harvard Graduate School of Education. In 2013, the program reached more than 6,000 low-income students in Grades 3 and 4 at 59 schools throughout the country.²⁹⁹ The three key elements (ABCs) of the READS program are:³⁰⁰

- Access to books at home, including a wide variety of texts
- Books that are well-matched to each child's reading level and interests
- Comprehension activities, including teacher scaffolding of summer book reading through end-of-year lessons, summer follow-up phone calls, and family support of summer reading

The READS Program (which stands for Reading Enhances Achievement During Summer) begins with teacher-led reading comprehension lessons at the end of the school year, as well as training sessions for the students' parents. The program also provides 10 age-appropriate books to each student to read during the summer.³⁰¹ The program provides students with a variety of titles, including Newberry and Caldecott award winners and popular books, such as Jeff Kinney's *Diary of a Wimpy Kid*.³⁰²

CLASSROOM

READS-trained teachers deliver six reading comprehension lessons to students at the end of each year. They teach students a "comprehension routine" to use as they read narrative and informational texts.³⁰³ In addition, READS administers the Iowa Test of Basic Skills (ITBS) to gather baseline data about students' reading skills, as well as a reading preference survey. The ITBS is re-administered in the fall to measure student reading growth over the summer.³⁰⁴

FAMILY ENGAGEMENT

Schools host READS Family Nights to provide students and parents the opportunity to learn about the READS program, describe when and how children receive books, and demonstrate how to use specially-designed tri-folds as a tool for reading together.³⁰⁵ In particular, trainers teach parents to use the EATS technique to scaffold their child's reading:³⁰⁶

- Encourage children to read the books
- Ask them whether they completed the tri-fold
- Talk with children about the books
- Send back the tri-fold (pre-stamped)

SUMMER MATERIALS AND FOLLOW-UP

²⁹⁹ Springen, K. "How to Create a Knockout Summer Literacy Program." *School Library Journal*.

<http://www.slj.com/2014/03/programs/how-to-create-a-knockout-summer-literacy-program/>

³⁰⁰ Bulleted text taken verbatim from: "READS for Summer Learning." Harvard Graduate School of Education. http://literacy-reforms.gse.harvard.edu/READS_about

³⁰¹ "Traditional READS Intervention." Harvard Graduate School of Education. <http://literacy-reforms.gse.harvard.edu/T-READS>

³⁰² Springen, Op. cit.

³⁰³ "Traditional READS Intervention," Op. cit.

³⁰⁴ Springen, Op. cit.

³⁰⁵ [1] "Traditional READS Intervention," Op. cit.

[2] For an example of reading trifolds produced by the publisher Scholastic, see: "Reading Response Trifolds for 40 Favorite Novels." <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0ahUKEwiP1lidisXKAhXJRyYKHTpUBNUQFghOMAI&url=http%3A%2F%2Ffoakflat.bigspringsd.org%2Fdownload.axd%3Ffile%3D3c72bbb1-763e-4e6b-91af-af257db104ca%26dnldType%3DResource&usg=AFQjCNH2gS1utOCdRxEgcFEzS42HdsiuqQ&bvm=bv.112454388,d.eWE>

³⁰⁶ "Traditional READS Intervention," Op. cit.

The READS program mails each child 10 books to read over the summer. Two of the books are texts that the child had studied in class. For each book, the program also includes a customized tri-fold for students to guide their reading. Program staff make phone calls to students throughout the summer to ensure that they are completing their tri-folds and to gather feedback about the program and the books that they are reading.³⁰⁷

CHICAGO SUMMER LEARNING CHALLENGE

Chicago's library-based summer reading program combines reading with an emphasis on STEAM (science, technology, engineering, art, and math) subjects. The Summer Learning Challenge has three components.³⁰⁸

- **Reading** books and magazines (at least 20 minutes per day)
- **Discovering** through hands-on programs, field trips, and using appropriate online sites
- **Creating** by solving engineering and design challenges and making artistic connections

In 2013, the Chicago Public Library system partnered with the city's mayor, Rahm Emanuel, to challenge students to read two million books. The initiative, called "Rahm's Readers," ultimately resulted in more than 70,000 children reading more than 2.1 million books. The mayor promised that if Chicago students met the two million book challenge, he, along with a local baseball player, would jump into Lake Michigan as part of the city's annual Polar Plunge.³⁰⁹ Recently, the library has asked students to track how many minutes they spend reading. In 2013, students spent more than 56 million minutes reading, equivalent to 100 years of reading over the course of the eight-week program.³¹⁰

STEAM PARTNERSHIPS

Since 2013, the Summer Learning Challenge has focused on STEAM subjects. In 2013, the program was called "Full STEAM Ahead."³¹¹ The 2015 program, called "Explore and Soar," emphasized space and astronomy.³¹² The Summer Learning Challenge integrates STEAM learning through partnerships with multiple community organizations, including:³¹³

- | | |
|----------------------------------|--|
| ■ Museum of Science and Industry | ■ Adler Planetarium |
| ■ Art Institute of Chicago | ■ Northwestern University FUSE Project |
| ■ Goodman Theatre | |

The community partners work with the city's 79 libraries to develop activities that take place at both the libraries and the partner sites. Students can earn electronic badges when they participate in these activities.³¹⁴ In addition, Northwestern University's FUSE Project developed science kits for students and trained library staff in how to introduce those projects to teens.³¹⁵

³⁰⁷ Ibid.

³⁰⁸ Bulleted text taken verbatim from: "Summer Learning Challenge." Chicago Public Library Foundation.

http://www.cplfoundation.org/site/PageServer?pagename=invest_children_school_summerlearning_co

³⁰⁹ "Chicago Kids Break Records in Chicago Public Library's 2013 Summer Learning Challenge." Chicago Public Library.

<https://www.chipublib.org/news/chicago-kids-break-records-in-chicago-public-libraries-2013-summer-learning-challenge/>

³¹⁰ Ibid.

³¹¹ Ibid.

³¹² "Summer Learning Challenge," Op. cit.

³¹³ [1] "Chicago Kids Break Records in Chicago Public Library's 2013 Summer Learning Challenge," Op. cit.

[2] "Summer Learning Challenge," Op. cit.

[3] Koester, A. "Full STEAM Ahead: Injecting Art and Creativity into STEM." School Library Journal.

<http://www.slj.com/2013/10/programs/full-steam-ahead-injecting-art-and-creativity-into-stem/>

³¹⁴ "Chicago Kids Break Records in Chicago Public Library's 2013 Summer Learning Challenge," Op. cit.

³¹⁵ Koester, Op. cit.

REPORT II: BEST PRACTICES IN TIER 1 LITERACY INSTRUCTION

INTRODUCTION

Students across the nation struggle with literacy, as the majority of U.S. primary and secondary students are less than proficient in reading. In fact, results from the 2015 National Assessment of Educational Progress (NAEP) indicate that less than 40 percent of students in Grades 4, 8, and 12 perform at or above the NAEP proficient level in reading.³¹⁶ High-quality literacy instruction and support across grade levels is thus critical to enhancing the development of students' literacy skills. To support this need, the following report discusses screening procedures for literacy intervention, identifying effective practices for delivering Tier 1 instruction in the general education classroom.

RTI MODEL FOR LITERACY

This section provides an overview of the Response to Intervention (RTI) model, highlighting a multi-tiered model for literacy specifically. Hanover then discusses universal literacy screenings – a core component of the RTI model – for primary and secondary students.

OVERVIEW

The RTI Action Network defines RTI as “a multi-tier approach to the early identification and support of students with learning and behavior needs.”³¹⁷ At large, the RTI model is grounded in “high-quality instruction and universal screening of all students within a general education classroom.”³¹⁸ Based on findings from universal screenings, struggling students receive increasingly intensive instructional supports, often provided by general classroom teachers, special education program staff, and other specialists. Insight from ongoing progress monitoring informs the duration and intensity of the supports that struggling students receive.³¹⁹ The figure below describes the four essential components of an effective RTI model highlighted by the RTI Action Network.

Essential Components of an Effective RTI Model

High-quality, scientifically based classroom instruction

- All students receive high-quality, research-based instruction in the general education classroom.

Ongoing student assessment

- Universal screening and progress monitoring provide information about a student's learning rate and level of achievement, both individually and in comparison with the peer group. These data are then used when determining which students need closer monitoring or intervention. Throughout the RTI process, student progress is monitored frequently to examine student achievement and gauge the effectiveness of the curriculum. Decisions made regarding students' instructional needs are based on multiple data points taken in context over time.

Tiered instruction

- A multi-tier approach is used to efficiently differentiate instruction for all students. The model incorporates increasing intensities of instruction offering specific, research-based interventions matched to student needs.

Parent involvement

- Schools implementing RTI provide parents information about their child's progress, the instruction and interventions used, the staff who are delivering the instruction, and the academic or behavioral goals for their child.

Source: RTI Action Network³²⁰

³¹⁶ [1] “Reading: National Results Overview.” The Nation's Report Card, 2015. https://www.nationsreportcard.gov/reading_math_2015/#reading?grade=4 [2] “Home: Mathematics & Reading at Grade 12.” The Nation's Report Card, 2015. https://www.nationsreportcard.gov/reading_math_g12_2015/#/

³¹⁷ “What Is RTI?” RTI Action Network. <http://www.rtinetwork.org/learn/what/whatisrti>

³¹⁸ Ibid.

³¹⁹ Ibid.

³²⁰ Figure text quoted verbatim from: Ibid.

Educators across grade levels may adopt an RTI model to organize literacy instruction and supports to meet varied student needs. While the RTI Action Network notes that “there is no single, thoroughly researched and widely practiced ‘model’ of the RTI process,”³²¹ an RTI model typically consists of three tiers of instructional supports that integrate various research-based academic or behavioral interventions.³²² Notably, most research on the RTI approach focuses on literacy, and experts note that RTI “has become a potent influence on the design and delivery of literacy programs in elementary schools throughout the United States.”³²³ While much of the focus of RTI is in primary schools, educators are increasingly expanding the model to secondary schools, whereupon experts support the RTI model as a framework for improving adolescent literacy specifically.³²⁴

MULTI-TIERED LITERACY INSTRUCTION

All RTI models are based on multi-tiered instructional processes where students receive instruction based on the nature and severity of their difficulties. As noted above, RTI models typically consist of three tiers of instruction, in which Tier 1 instruction refers to high-quality *universal* instruction provided in the general education classroom. Instruction within Tiers 2 and 3 refers to additional intensive instruction in *small-group* or *one-on-one* settings for select students. Subsequently, Tier 2 and 3 interventions are supplemental, and, as such, students receiving these intensive supports continue to receive Tier 1 literacy instruction in the general classroom.

When implemented correctly, the majority of students (e.g., 75 to 80 percent) should “reach successful levels of competency” through Tier 1 instruction, while the remaining students receive targeted Tier 2 and 3 instruction and interventions.³²⁵ The following figure provides an overview of the instructional tiers within a three-tiered RTI model.

Overview of a Three-Tiered RTI Model

| TIER | DESCRIPTION |
|---------------|--|
| Tier 1 | Tier 1, or universal, instruction refers to the instructional program that all students receive in the general education classroom. Usually, the Tier 1 instructional program is synonymous with the core reading or math curriculum that is typically aligned with state standards. The intent of the core program is the delivery of a high-quality instructional program in reading or math that has established known outcomes that cut across the skill development of the targeted area. |
| Tier 2 | Tier 2 consists of children who fall below the expected levels of accomplishment (called benchmarks) and are at some risk for academic failure but who are still above levels considered to indicate a high risk for failure. The needs of these students are identified through the assessment process, and instructional programs are delivered that focus on their specific needs. Instruction is provided in smaller groups than Tier 1 is. |

³²¹ Ibid.

³²² Ibid.

³²³ [1] Hughes, C. and D. Dexter. “Universal Screening Within a Response-to-Intervention Model.” RTI Action Network. <http://www.rtinetwork.org/learn/research/universal-screening-within-a-rti-model> [2] Brozo, W. “The Role of Content Literacy in an Effective RTI Program.” *The Reading Teacher*, 64:2, 2010. p. 147. Accessed via ProQuest.

³²⁴ [1] Ehren, B. “Response to Intervention in Secondary Schools: Is It on Your Radar Screen?” RTI Action Network. <http://www.rtinetwork.org/learn/rti-in-secondary-schools/response-to-intervention-in-secondary-schools> [2] Burns, M. “Response to Intervention for Literacy in Secondary Schools.” RTI Action Network. <http://www.rtinetwork.org/learn/rti-in-secondary-schools/rti-literacy-secondary-schools>

³²⁵ Figure text quoted (with minor changes in the Tier 1 description) from: Shapiro, E. “Tiered Instruction and Intervention in a Response-to-Intervention Model.” RTI Action Network. <http://www.rtinetwork.org/essential/tieredinstruction/tiered-instruction-and-intervention-rti-model>

| TIER | DESCRIPTION |
|---------------|--|
| Tier 3 | Tier 3 consists of children who are considered to be at high risk for failure and, if not responsive, are considered to be candidates for identification as having special education needs. The groups of students at Tier 3 are of much smaller sizes, ranging from 3 to 5 children, with some models using one-to-one instruction. In such models where one-to-one instruction is used, Tier 3 is usually considered special education; however, in many models it is viewed as a tier that includes children who are not identified as being in need of special education but whose needs are at the intensive level. |

Source: RTI Action Network³²⁶

With the RTI model, universal literacy screening identifies students who are most at-risk for developing reading disabilities; identified students then receive Tier 2 (and possibly Tier 3) supports to address skills deficits. At the primary level, Tier 2 supports involve “increasing the time and intensity of the child’s exposure to the core curriculum for children who do not appear to be responding appropriately to Tier 1 instruction.”³²⁷ In practice, identified students might spend 30 minutes each day reading in a small group with a focus on building word recognition skills.³²⁸ Identified students at the secondary level might participate in regular small-group Tier 2 interventions to build phonic skills or reading fluency, for example.³²⁹ As the figure below describes, students receiving Tier 2 (as well as Tier 3) instruction undergo regular progress monitoring to assess their response to the intervention and inform future supports.

Progress Monitoring for Students Receiving Tier 2 and 3 Instruction

Experts recommend that regular progress monitoring begin once results from a universal screening measure identify that a student is at-risk for poor academic outcomes. Progress monitoring informs whether a student continues to receive Tier 2 instruction, requires more intensive Tier 3 instruction, or can return to receiving Tier 1 instruction only.

- **Educators may use universal screening measures (discussed in the following subsections) as progress monitoring tools, or other measures that assess students’ skills over time.**³³⁰ Recommended target areas for progress monitoring of students in Kindergarten through Grade 2 include:
 - Phoneme segmentation (Kindergarten through Grade 1)
 - Nonsense word fluency (Grade 1)
 - Word identification (Grade 1-2)
 - Oral reading fluency/passage reading fluency (Grades 1-2)
- **What Works Clearinghouse (WWC) recommends that students receiving Tier 2 instruction be monitored at least monthly, or eight times during the school year.** The WWC notes that “many Tier 2 intervention programs include weekly mastery tests that educators can use to guide instruction” as a form of progress monitoring.³³¹

Source: RTI Action Network and WWC (see citations in the figure)

Students who fail to respond to Tier 2 instruction and/or have more serious risks for poor literacy outcomes receive Tier 3 interventions. While some researchers find that between 2 and 7 percent of students receive Tier 3 supports, the RTI Action Network notes that “there is no clear methodological definition of how or when a student is to be identified as a nonresponder to intervention, what intervention is to be used, who is to deliver the intervention, or how nonresponsiveness is to be measured.”³³² Consequently, the identification of students for Tier 2 and 3 supports will vary across schools and contexts. The figure below describes

³²⁶ Figure text quoted (with minor changes in the Tier 1 description) from: Ibid.

³²⁷ Dickman, G.E. “RTI and Reading: Response to Intervention in a Nutshell.” ReadingRockets.
<http://www.readingrockets.org/article/rti-and-reading-response-intervention-nutshell>

³²⁸ Ibid.

³²⁹ Burns, Op. cit.

³³⁰ Dexter, D. and C. Hughes. “Progress Monitoring Within a Response-to-Intervention Model.” RTI Action Network.
<http://www.rtinetwork.org/learn/research/progress-monitoring-within-a-rti-model>

³³¹ “Best Practice for RTI: Monitor Progress of Tier 2 Students.” What Works Clearinghouse.
<http://www.readingrockets.org/article/best-practice-rti-monitor-progress-tier-2-students>

³³² Dexter, D. and C. Hughes. “Making Decisions About Adequate Progress in Tier 2.” RTI Action Network.
<http://www.rtinetwork.org/learn/research/making-decisions-about-adequate-progress-in-tier-2>

recommendations (and the corresponding levels of evidence) from the Institute of Education Sciences (IES) for implementing an RTI model for literacy at the elementary school level.

Recommendations for a RTI Model for Elementary-Level Literacy

| RECOMMENDATION | LEVEL OF EVIDENCE* |
|--|--------------------|
| Universal Screening | |
| <ul style="list-style-type: none"> Screen all students for potential reading problems at the beginning of the year and again in the middle of the year. Regularly monitor the progress of students at risk for developing reading disabilities. | Moderate |
| Tier 1 Intervention/General Education | |
| <ul style="list-style-type: none"> Provide time for differentiated reading instruction for all students based on assessments of students' current reading level. | Low |
| Tier 2 Intervention | |
| <ul style="list-style-type: none"> Provide intensive, systematic instruction on up to three foundational reading skills in small groups to students who score below the benchmark score on universal screening. Typically, these groups meet between three and five times a week, for 20 to 40 minutes. | Strong |
| <ul style="list-style-type: none"> Monitor the progress of Tier 2 students at least once a month. Use these data to determine whether students still require intervention. For those students still making insufficient progress, schoolwide teams should design a Tier 3 intervention plan. | Low |
| Tier 3 Intervention | |
| <ul style="list-style-type: none"> Provide intensive instruction on a daily basis that promotes the development of the various components of reading proficiency to students who show minimal progress after reasonable time in Tier 2 small group instruction (Tier 3). | Low |

*Broadly, a "strong" level of evidence indicates that high-quality studies (e.g., those that can support causal conclusion) back this recommendation. A "low" level of evidence indicates that the recommendation is based on expert opinion and more limited and/or lesser-quality research findings.

Source: IES³³³

UNIVERSAL LITERACY SCREENINGS

Universal screenings are a key component of an RTI model and serve to identify students who are at-risk for learning disabilities. The RTI Action Network notes that universal screenings typically occur three times each school year (e.g., in the fall, winter, and spring) and "consist of brief assessments focused on target skills that are highly predictive of future outcomes."³³⁴ Students identified through universal screenings as at-risk typically either begin to receive more intensive instructional supports (i.e., Tier 2 instruction) immediately or are monitored for an additional period before entry into Tier 2 to confirm the accuracy of the initial screening. Research, however, presents conflicting findings as to which progress-monitoring method leads to more accurate student identifications. Given these inconclusive findings, districts are advised to select a method that aligns with their "tolerance of under- or over-identification rates."³³⁵

Effective universal screening measures for literacy accurately identify students who are at-risk of performing poorly on future literacy measures. The following figure lists four elements of effective universal screening measures which limit the number of (1) students who are mistakenly identified as at-risk (false *positives*), and (2) students who are at-risk but go unidentified (false *negatives*).

³³³ Figure adapted from: Gersten, R., D. Compton, C. Connor, and J. Dimino. "Assisting Students Struggling with Reading: Response to Intervention (RtI) and Multi-Tier Intervention in the Primary Grades." Institute of Education Sciences, 2009. p. 6.
https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/rti_reading_pg_021809.pdf

³³⁴ Hughes and Dexter, "Universal Screening Within a Response-to-Intervention Model," Op. cit.

³³⁵ Ibid.

Elements of Effective Universal Screening Measures

| ELEMENT | DESCRIPTION |
|-------------------------------|--|
| Sensitivity | Sensitivity refers to the degree to which a screening mechanism reliably identifies at-risk students who, in fact, perform unsatisfactorily on a future criterion measure. These students are referred to as true positives, those who truly are at risk for future academic difficulties. A screening measure with good sensitivity will also help reduce the numbers of false negatives. |
| Specificity | Specificity refers to the degree to which a screening mechanism accurately identifies students who later perform satisfactorily on a criterion measure. These students are referred to as true negatives, those who truly are not at risk for future academic difficulties. A screening measure with good specificity will also help reduce the numbers of false positives. |
| Practicality | An effective screening measure should also be brief and simple. An efficient screening measure will quickly identify students who are lagging behind their peers, thereby maximizing instructional time. The screening measure should also be simple enough to be implemented on a wide scale, by normal people under normal circumstances. |
| Consequential Validity | Effective universal screening measures should also be consequentialy valid. This means the screening measure does no harm to the student (e.g., avoids inequitable treatment) and is linked to effective interventions. |

Source: RTI Action Network³³⁶

Keeping in mind these elements for effective screening, consensus lacks as to the specific criteria districts should use to identify students who receive Tier 2 (or more intensive) supports. The RTI Action Network notes that some researchers take a normative approach to screening. Following this approach, students scoring in the bottom percentile of the universal screening measure are identified as at-risk and are provided with more intensive supports. Districts may also set “absolute performance levels or benchmarks” to identify at-risk students. As such, screening tools may classify students who are at-risk for unsatisfactory literacy outcomes according to the severity of the risk. For example, universal screening measures differentiate between students at-risk for *unsatisfactory* and *very unsatisfactory* outcomes. Depending on the number of at-risk students, a “very unsatisfactory” severity criterion (corresponding to the lowest 10 percent of students, for example) may be preferable; otherwise, the district risks overidentifying the number of students referred for Tier 2 supports.³³⁷

SCREENING PRIMARY STUDENTS

Universal screenings in literacy often focus on students in the early primary and pre-primary grades. Research indicates that early identification and intervention for young students is essential for preventing future reading problems, as students become less responsive to intervention after Grade 3. Thus, early literacy screening “provides a mechanism for identifying those children who are a) at risk for reading failure, b) in need of a more thorough and detailed assessment, and c) in need of targeted intervention for improving literacy skills and reading acquisition so they do not fall behind peers.”³³⁸

While no one approach to screening is universally advocated by researchers or experts, literacy screenings in preschool and Kindergarten can support positive literacy outcomes for at-risk students. Some literature supports literacy screenings that occur before formal instruction in literacy begins (e.g., in preschool) while other researchers note that screening in preschool or at the beginning of Kindergarten is likely to reduce the measure’s predictive accuracy. The RTI Action Network notes, however, that failing to identify delays in early literacy skills is risky and that “information obtained from early reading screenings conducted in the preschool and Kindergarten years is likely to lead to positive changes in children’s reading trajectories.”³³⁹ In addition

³³⁶ Figure text quoted verbatim from: Ibid.

³³⁷ Ibid.

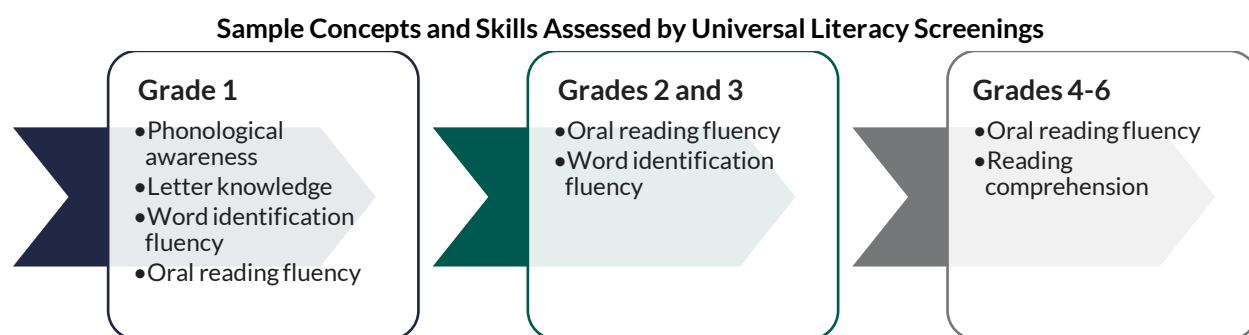
³³⁸ Pool, J. “Screening for Reading Problems in Preschool and Kindergarten: An Overview of Select Measures.” RTI Action Network. <http://www.rtinetwork.org/essential/assessment/screening/screening-for-reading-problems-in-preschool-and-Kindergarten>

³³⁹ Ibid.

to meeting the elements of effective universal screening measures (Figure 1.5), early reading screening measures for Kindergarten students should assess the following core literacy skills:³⁴⁰

- **Phonological awareness** (ability to identify and manipulate sounds);
- **Alphabet knowledge** (awareness of individual letters and letter names);
- **Concept of word** (ability to segment spoken sentences/phrases into words and to match spoken words to text); and
- **Grapheme-phoneme correspondence** (ability to identify correspondence between letters and sounds).

As students acquire literacy skills through elementary school, universal literacy screenings need to incorporate different concepts and skills. The RTI Action Network cautions that screening tools that are appropriate at one point in students' literacy development may not provide accurate information later in the same school year.³⁴¹ The figure below lists a sample of the literacy concepts and skills that universal screening measures should assess based on grade level.



Source: State Education Resource Center of CT³⁴²

ENGLISH LEARNERS

Research indicates that the same screening and progress monitoring tools are effective for both monolingual and English Learners. However, assessment of English Learners should also occur in the student's second language (i.e., other than English). Specifically, the National Center on Response to Intervention recommends that, when assessing English Learners' literacy skills, educators:³⁴³

- Use tools with demonstrated reliability and validity to identify and monitor students' need for instructional support in reading in both L1 [the student's first language] and L2 [the student's second language].
- Assess students' language skills in L1 and L2 to provide an appropriate context regarding evaluation of current levels of performance.
- Evaluate the potential effect of the process of L1 and L2 acquisition on current performance.
- Plan instruction based on what is known about the student's current level of performance and his or her literacy experiences in L1 and L2.

³⁴⁰ Bullets quoted verbatim from: Ibid.

³⁴¹ Pool, Op. cit.

³⁴² Figure adapted from: "Elementary Assessments: Universal Screening, Diagnostic, & Progress Monitoring." State Education Resource Center of CT, 2012. http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/cali/elementary_assessments_4-9-12.pdf

³⁴³ Bullets quoted verbatim from: Brown, J. and A. Sanford. "RTI for English Language Learners: Appropriately Using Screening and Progress Monitoring Tools to Improve Instructional Outcomes." National Center on Response to Intervention, 2011. pp. 10–11. <http://www.rti4success.org/sites/default/files/rtiforells.pdf>

SCREENING SECONDARY STUDENTS

Secondary schools should consider using multiple measures to screen students for literacy difficulties. The RTI Action Network finds that “curriculum-based measurement of oral reading fluency (ORF) is by far the most commonly used assessment model in RtI for literacy at the secondary level.”³⁴⁴ At large, ORF measures the number of words students can read accurately per minute. National norms for words per minute are available through Grade 8.³⁴⁵ However, ORF’s accuracy in indicating literacy skills declines after Grade 6. Consequently, secondary educators should consider using multiple screening measures. In this vein, the RTI Action Network highlights the MAZE procedure, which involves students filling in missing words in a narrative, as an option for screening. The RTI Action Network also recommends “group-administered measures of reading comprehension such as the Northwest Evaluation Association’s Measures of Academic Progress for Reading or the Scholastic Reading Inventory.”³⁴⁶ Nonacademic indicators, including attendance, discipline data, and school climate measures, may also be incorporated into a comprehensive literacy screening process at the secondary level.³⁴⁷

LITERACY SCREENING TOOLS

For screening tools suited for students across primary and secondary grade levels, the National Center on Intensive Interventions at American Institutes for Research provides a [searchable screening tools chart](#), which presents information on each tool based on annual reviews. Users can sort by grade (elementary or secondary) and subject (reading or math), as well as by classification accuracy, generalizability, efficiency, and other characteristics.³⁴⁸

The RTI Action Network also identifies a selection of widely used screening tools for preschool and kindergarten, as displayed in the following figure. Note that the predictive validity of these tools varies (see figure source for additional details).

Early Reading Screening Assessments

| MEASURE | AGE RANGE | SKILLS ASSESSED | ADMINISTRATION TIME | ADMINISTRATION FORMAT |
|---|-----------------------|--|---|--|
| Basic Early Assessment of Reading (BEAR) | K – Grade 3 | Basic reading skills; listening/reading comprehension; language arts; letter recognition fluency; passage reading fluency | 90 minutes for screener; 30-40 minutes per subset | Individual and class-wide; paper-and-pencil or computer assisted |
| Dynamic Indicators of Basic Early Literacy Skills (DIBELS) | PreK – Grade 3 | Phonemic awareness; pseudo-word readings; letter naming; oral reading; story retelling; word usage (all 1 minute fluency measures) | 3 minutes per task; 10-20 minutes per child | Individual |
| Group Reading Assessment and Diagnostic Evaluation (GRADE) | PreK – Post-secondary | Pre-reading; reading readiness; phonological awareness; vocabulary; reading comprehension; listening comprehension | 115 minutes for Pre-K level | Class-wide |

³⁴⁴ Burns, Op. cit.

³⁴⁵ See: “Hasbrouck-Tindal oral reading fluency chart.” Read Naturally. <https://www.readnaturally.com/knowledgebase/how-to/9/59>

³⁴⁶ Burns, Op. cit.

³⁴⁷ Ibid.

³⁴⁸ “Academic Screening Tools Chart.” National Center on Intensive Intervention at American Institutes for Research. <http://www.rti4success.org/resources/tools-charts/screening-tools-chart>

| MEASURE | AGE RANGE | SKILLS ASSESSED | ADMINISTRATION TIME | ADMINISTRATION FORMAT |
|---|-----------------|---|---|---------------------------------------|
| Phonological Awareness Literacy Screening for Preschool (PALS-PreK) | PreK (Ages 4-5) | Name writing; alphabet knowledge; beginning sound awareness; print and word awareness; rhyme awareness; nursery rhyme awareness | 10-15 minutes | Individually; small group; class-wide |
| Phonological Awareness Literacy Screening | K (Ages 5-6) | Rhyme awareness; beginning sound awareness; alphabet knowledge; letter sounds; spelling; concept of word; word recognition in isolation | 20-25 minutes | Individually; small group; class-wide |
| Predictive Assessment of Reading (PAR) | K – Grade 3 | Phonemic awareness; fluency; single-word reading; vocabulary knowledge | 15 minutes per student | Individually; small group; class-wide |
| STAR Early Literacy | PreK – Grade 3 | General readiness; grapho-phonemic knowledge; phonemic awareness; phonics; comprehension; structural analysis; vocabulary | 15 minutes per student; 30 minutes for entire classroom | Individually (on computer) |
| Test of Early Reading Ability-3 (TERA-3) | Ages 3-8 | Alphabet knowledge; print conventions; print comprehension | 15-30 minutes | Individually |
| Texas Primary Reading Inventory (TPRI) | K – Grade 2 | Kindergarten screening tasks: grapho-phonemic knowledge and phonemic awareness | 5-7 minutes for screener | Individually and class-wide |

Source: RTI Action Network³⁴⁹

TIER 1 LITERACY INSTRUCTION FOR PRIMARY STUDENTS

This section first reviews Tier 1 literacy instruction for primary students (Kindergarten through Grade 5) and then identifies instructional strategies related to the five components of comprehensive literacy instruction: phonemic awareness, phonics and word study, fluency, vocabulary, and reading comprehension. The section concludes with a discussion of supporting instructional practices that may be applied to any of these core components to literacy development.

OVERVIEW

High-quality instruction in literacy for primary students can mitigate and prevent poor reading outcomes in future years. Students with early reading problems who do not receive high-quality instruction often develop more serious literacy-related difficulties as adolescents when they are also more resistant to intervention. Indeed, research indicates that:³⁵⁰

³⁴⁹ Figure adapted from: Pool, Op. cit.

³⁵⁰ Quoted verbatim from: Denton, C. "High-Quality Classroom Instruction: Classroom Reading Instruction That Supports Struggling Readers." RTI Action Network. <http://www.rtinetwork.org/essential/tieredinstruction/tier1/highquality>

The vast majority of reading problems—even those that would develop into serious reading difficulties—can be prevented when students in the primary grades are provided with quality classroom reading instruction along with additional small-group intervention when needed.

As demonstrated in the figure below, high-quality instruction for all students is the foundation of Tier 1 literacy instruction. Overall, primary students should receive at least 90 minutes of daily literacy instruction across the entire school year from their general education teacher(s). While progress monitoring is often reserved for students receiving Tier 2 and 3 supports, The IRIS Center—a national center dedicated to improving education outcomes and housed at the Peabody College of Vanderbilt University—recommends that teachers monitor the progress of all primary students regularly throughout the school year during which students receive Tier 1 instruction.

Overview of Tier 1 Instruction in Literacy (Primary Level)

| CATEGORY | TIER 1 INSTRUCTION | |
|----------------------------------|--|--|
| Who receives instruction | All students | |
| Amount of daily instruction | Instruction should occur for at least 90 minutes | |
| When instruction is provided | During core reading time | |
| Duration of instruction | Entire school year | |
| How instruction is implemented | Flexible grouping, which include: | |
| | <ul style="list-style-type: none"> ▪ Whole-class instruction ▪ Small group instruction | <ul style="list-style-type: none"> ▪ Paired instruction ▪ One-on-one instruction |
| Frequency of progress monitoring | At least one time every 1-2 weeks | |
| Who provides instruction | General education teacher | |
| Where students are served | General education classroom | |

See this report's appendix on pages 89 to 91 for a similar overview of Tier 2 and 3 instruction in literacy at the primary level.
Source: The IRIS Center³⁵¹

As stated by The IRIS Center, “**high-quality [literacy] instruction refers to the utilization of both research-validated instructional practices and core reading programs.**”³⁵² Accordingly, the following subsections discuss (1) the components of comprehensive literacy instruction and primary reading programs, and (2) research-supported instructional practices for teaching literacy across these components in a general classroom setting.

COMPREHENSIVE PRIMARY LITERACY INSTRUCTION

Seminal reports published by the National Research Council (NRC) and the National Reading Program (NRP) in 1998 and 2000, respectively, indicate that **reading instruction for primary students should address the following domains: phonemic awareness, phonics, fluency, vocabulary, and comprehension.**³⁵³ The IRIS Center similarly recommends that schools adopt a core literacy program focused on these domains or components as the foundation for early literacy instruction. The next figure provides further information on The IRIS’s recommended strategies for adopting a core literacy program.

³⁵¹ Figure adapted from: “Page 10: Effective Instruction at Tier 1.” The IRIS Center, 2006. p. 10.
<https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q4/p10/#content>

³⁵² Bolded emphasis added: “Page 2: High-Quality Instruction: Instructional Practices.” The IRIS Center, 2006.
<https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q2/p02/#content>

³⁵³ Denton, C. “Classroom Reading Instruction That Supports Struggling Readers: Key Components for Effective Teaching.” National Research Council. <http://www.rtinetwork.org/essential/tieredinstruction/tier1/effectiveteaching>

Adopting a Core Literacy Program



The IRIS Center highlights a comprehensive core reading program as “the primary instructional tool that teachers use to implement effective reading instruction.” Such programs:

- Organize the scope and sequence of lessons in which specific skills are taught so that teachers don’t have to make it up as they go
 - Create consistency across classrooms, grade levels, schools, and districts
 - Provide research-validated materials and strategies for meeting diverse students’ needs
 - Build curricula and instructional practices that support students’ initial learning as well as the transfer of knowledge and skills to other contexts
 - Reflect state standards, which identify benchmarks and target instruction at each grade level
- ***
- **Evaluating a core literacy program.** To evaluate a current core reading program to assess whether it addresses the five components of comprehensive literacy instruction, The IRIS Center recommends schools use the [Consumer’s Guide to Evaluating a Core Reading Program](#), a free tool from the Institute for the Development of Educational Achievement, College of Education, University of Oregon.³⁵⁴ According to The IRIS Center, “teachers can utilize this tool to help determine the strengths and weaknesses of their school’s core reading program. If a program’s analysis indicates that one or more components are weak, teachers should enrich the program through supplemental materials or instructional activities.”
 - **Supplemental Tier 1 Literacy Interventions.** Educators may enhance a core reading program with Tier 1 literacy interventions for any of the five components of early literacy. For example, an [online resource](#) at ReadingRockets lists specific literacy interventions for students in Kindergarten through Grade 6 that target each of these components.³⁵⁵

Source: The IRIS Center³⁵⁶

Though Tier 1 instruction in the primary grades should address the five core components to literacy, some variation exists across these early grades in the focus of these components. For instance, Kindergarten and Grade 1 students should receive instruction in phonemic awareness, but by Grade 2, this should no longer remain a core instructional focus. Instruction in fluency, on the other hand, should be introduced after Kindergarten. Students in Kindergarten through Grade 3 should otherwise receive literacy instruction in the remaining reading components. The figure below lists the five components of comprehensive literacy instruction, as well as the grade levels in which teachers should integrate each component.

Five Components of Comprehensive Literacy Instruction (Primary Level)

| READING COMPONENT | KINDERGARTEN | GRADE 1 | GRADE 2 | GRADE 3 |
|------------------------|--------------|---------|---------|---------|
| Phonemic Awareness | ✓ | ✓ | | |
| Phonics and Word Study | ✓ | ✓ | ✓ | ✓ |
| Fluency | | ✓ | ✓ | ✓ |
| Vocabulary | ✓ | ✓ | ✓ | ✓ |
| Reading Comprehension | ✓ | ✓ | ✓ | ✓ |

Source: The IRIS Center³⁵⁷

³⁵⁴ “Consumer’s Guide to Evaluating a Core Reading Program Grades K-3: A Critical Elements Analysis.

³⁵⁵ Kelly, C. “Reading Intervention Programs: A Comparative Chart.” ReadingRockets. <http://www.readingrockets.org/article/reading-intervention-programs-comparative-chart>

³⁵⁶ Figure content adapted (bullets quoted verbatim) from: “Page 3: High-Quality Instruction: Comprehensive Core Reading Program.” The IRIS Center, 2006. p. 3. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q2/p03/#content>

³⁵⁷ Figure adapted from: “Page 3: High-Quality Instruction: Comprehensive Core Reading Program,” Op. cit.

PHONEMIC AWARENESS

Instruction for students in Kindergarten and Grade 1 should include a focus on phonemic awareness. Phonemic awareness skills support reading comprehension, spelling, and decoding words.³⁵⁸ While targeted at students who are just learning to read, older students should receive instruction in phonemic awareness as needed.³⁵⁹ The IRIS Center states that:³⁶⁰

Phonemic awareness refers to the ability to listen, identify, and manipulate phonemes—the smallest units of sounds that are combined to create words. For instance, the three phonemes in the word “mop” are /m/ /o/ /p/. Students learn to read more easily when they are aware of these phonemes.” Phonemic awareness skills support reading comprehension, spelling, and decoding words.

For beginning readers, teachers should provide auditory examples of “how words are formed with sounds.”³⁶¹ Auditory examples introduce “beginning readers to the relationship between sounds and words.”³⁶² The NRP recommends that teachers use letters and reading and writing tasks when teaching phonemic awareness. Teachers should also pretest for phonemic awareness skills to adjust the amount of instruction on this topic.³⁶³ The following figure lists instructional tips for teaching phonemic awareness on the following page.

Tips for Teaching Phonemic Awareness (Kindergarten – Grade 1)

- Start with easy “blend” sounds that are continuous, such as /m/, /s/, and /f/, rather than with short, “stop” sounds, such as /b/, /d/, and /t/.
- When modeling sounds, instruct students to watch your lips and mouth.
- Ask students to practice in front of mirrors as you model, so that they can watch the movements of their lips and mouths.
- Use games, music, pictures, and objects to teach early phonemic awareness skills.
- Engage students in active learning techniques. For example, students can hold up fingers for each sound heard in the word “bubbles.” Or small toys and objects can be used to cue students (e.g., a student holds a toy dog and says the sounds /d/ /o/ /g/).
- Avoid adding in extra sounds such as the “schwa” /ə/ after individual phonemes (e.g., /tə/ instead of /t/).

Source: The IRIS Center³⁶⁴

PHONICS AND WORD STUDY

Instruction in phonics and word study supports students with word recognition, reading, and spelling. Phonics refers to the relationship between letters, sounds, and written language, while word study is an approach to spelling instruction that emphasizes the “regularities, patterns, and derivations in English words.”³⁶⁵ While recommended for all students starting in Kindergarten or early Grade 1 through Grade 3, the RTI Action Network notes that “many students with reading problems continue to need instruction in phonics and word study even when they are in the upper elementary and secondary grades.”³⁶⁶ The following figure lists tips for instruction in phonics and word study below.

³⁵⁸ “Page 4: Phonemic Awareness.” The IRIS Center, 2006. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q3/p04/#content>

³⁵⁹ Denton, “Classroom Reading Instruction That Supports Struggling Readers: Key Components for Effective Teaching,” Op. cit.

³⁶⁰ Quoted verbatim from: “Page 4: Phonemic Awareness,” Op. cit.

³⁶¹ Ibid.

³⁶² Ibid.

³⁶³ “Teaching Children to Read.” National Reading Panel. pp. 2.6-2.7.

<https://www.nichd.nih.gov/publications/pubs/nrp/Documents/report.pdf>

³⁶⁴ Figure bullets quoted verbatim from: “Page 4: Phonemic Awareness,” Op. cit.

³⁶⁵ [1] “Page 5: Phonics and Word Study.” The IRIS Center, 2006. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q3/p05/#content> [2] Williams, C. et al. “Word Study Instruction in the K-2 Classroom.” ReadingRockets. <http://www.readingrockets.org/article/word-study-instruction-k-2-classroom>

³⁶⁶ [1] “Page 3: High-Quality Instruction: Comprehensive Core Reading Program,” Op. cit. [2] Denton, “Classroom Reading Instruction That Supports Struggling Readers: Key Components for Effective Teaching,” Op. cit.

Tips for Teaching Phonics and Word Study (Kindergarten/Grade 1 – Grade 3+)

- Include instruction on high-frequency sight words (e.g., “was,” “you,” “said”).
- Teach explicit strategies for decoding and reading multi-syllable words.
- Reinforce decoding skills with spelling activities.
- Provide ample practice for the decoding skills that students have already learned.
- Include activities that allow students to practice decoding skills through writing and spelling.
- Encourage students to use context clues to support their decoding efforts.
- Use word-building activities to help students decode words.
- Utilize short books and stories that feature words with the specific letter-sound relationships being taught in class.
- Give students activity sheets with the letters and letter combinations they are learning and ask them to form new words using these combinations.

Source: The IRIS Center³⁶⁷

PHONICS

While specific approaches to teaching phonics vary, The IRIS Center states that “**teachers should begin instruction by teaching letter-sound correspondences in a specific sequence.**”³⁶⁸ Students then use these letter-sound correspondences to decode words.³⁶⁹ Teachers may provide phonics instruction *incidentally* (by highlighting patterns opportunistically throughout instruction) or *systematically* (by creating “a planned sequence of phonics elements” to integrate into instruction).³⁷⁰ Research indicates that systematic phonics instruction has significant benefits for students in Kindergarten through Grade 6. The figure below presents variations of systematic phonics instruction, which vary in the explicitness “by which the phonic elements are taught and practiced in the reading of text.”³⁷¹

Variations of Systematic Phonics Instruction

| APPROACH | DESCRIPTION |
|--------------------------|--|
| Analogy phonics | Teaching students unfamiliar words by analogy to known words (e.g., recognizing that the rime segment of an unfamiliar word is identical to that of a familiar word, and then blending the known rime with the new word onset, such as reading brick by recognizing that -ick is contained in the known word kick, or reading stump by analogy to jump). |
| Analytic phonics | Teaching students to analyze letter-sound relations in previously learned words to avoid pronouncing sounds in isolation. |
| Embedded phonics | Teaching students phonics skills by embedding phonics instruction in text reading, a more implicit approach that relies to some extent on incidental learning. |
| Phonics through spelling | Teaching students to segment words into phonemes and to select letters for those phonemes (i.e., teaching students to spell words phonemically). |
| Synthetic phonics | Teaching students explicitly to convert letters into sounds (phonemes) and then blend the sounds to form recognizable words. |

Source: ReadingRockets³⁷²

³⁶⁷ Figure bullets quoted verbatim from: “Page 5: Phonics and Word Study,” Op. cit.

³⁶⁸ Bolded emphasis added: Ibid., p. 5.

³⁶⁹ Ibid.

³⁷⁰ “Phonics Instruction.” National Reading Panel. <http://www.readingrockets.org/article/phonics-instruction>

³⁷¹ Ibid.

³⁷² Figure text quoted verbatim from: Ibid.

WORD STUDY

Students receiving instruction in word study learn to decode words based on “the alphabetic, pattern, and meaning layers of English orthography,” rather than memorization.³⁷³

- **Alphabetic layer.** When studying the alphabetic layer, students examine the relationship between letters and sounds. They learn to match single letters and pairs of letters (e.g., *ch*) to specific sounds and, in doing so, to create words.
- **Pattern layer.** When students study the pattern layer, they look beyond single or paired letter-sounds to search for larger patterns that guide the grouping of letters (e.g., *CVCe*).
- **Meaning layer.** Studying the meaning layer helps students to understand how the English spelling system can directly reflect the semantic relationships across related words. For example, students come to understand that the second vowel in *composition* is spelled with an *o* because it is related to *compose*.

Word study instruction aims to improve students’ understanding of English orthography. Teachers should provide examples of how knowledge gained from word study instruction can be used while students read and write.³⁷⁴ The following figure lists additional strategies to support students’ understanding of word study.

Strategies that Support Students’ Use of Word Study

- Say the word slowly and listen for the sounds you hear (initial sound, middle sound, final sound)
- Say the word slowly and listen for any parts you know (*br* in *brought*)
- Clap the syllables and write letters for each part you hear
- Use words you know (*fun* and *silly* to *funny*)
- Use names you know (*William* to *will*)
- Use a rhyming word (*rain* to *train*)
- Use word families to spell related words
- Think about different spelling patterns that can spell the sound you hear (*out* vs. *down*)
- Try it on a practice page and see if it looks right
- Use a resource in the classroom (chart, word wall, book, dictionary, calendar, words you’ve already written)

Source: Reading Rockets³⁷⁵

FLUENCY

Reading fluency, the “ability to read text with accuracy, speed, and intonation,” is a key component of comprehensive literacy instruction.³⁷⁶ Fluency supports reading comprehension, as students who struggle to decode and/or recognize words are also likely to struggle to understand what they are reading. According to The IRIS Center, “fluency develops when students practice reading and rereading words, passages, or other texts with a high degree of success.”³⁷⁷ Instruction that supports fluency typically begins during the second half of Grade 1 and continues through Grade 3 and beyond.³⁷⁸ **To increase fluency, teachers should provide opportunities for repeated oral reading practice.** The NRP finds that instructional approaches that encourage repeated oral reading increase reading proficiency. Conversely, research does not find that silent reading affects proficiency.³⁷⁹ Strategies to incorporate repeated reading into instruction include:³⁸⁰

³⁷³ Bullets quoted verbatim from: Williams et al., Op. cit.

³⁷⁴ Ibid.

³⁷⁵ Figure bullets quoted verbatim from: Ibid.

³⁷⁶ “Page 6: Fluency.” The IRIS Center, 2006. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q3/p06/#content>

³⁷⁷ Ibid.

³⁷⁸ Ibid.

³⁷⁹ “Teaching Children to Read,” Op. cit., pp. 3.3-3.4.

³⁸⁰ Bullets quoted verbatim from: “Page 6: Fluency,” Op. cit.

- **Repeated reading:** A student reads the same passage multiple times until fluency is achieved.
- **Using technology:** A student uses a computer or other equipment, such as a tape recorder, to assist with fluency.
- **Choral reading:** The class or group reads out loud along with the teacher.
- **Partner reading:** Students are paired to practice reading and rereading.
- **Echo Reading:** Students echo a teacher or another skilled student reader.

Teachers should monitor and identify students' reading levels regularly to match them with appropriate texts to practice fluency. Meaning, students should not practice fluency with texts that will frustrate them. Teachers can match a student's reading level with a specific text by having them read a passage aloud for a minute and counting the number of misread words. The figure below describes three fluency levels and their implications for instruction. Notably, immediate corrective feedback is necessary during fluency practice.³⁸¹

Fluency Reading Level Guide

| FLUENCY LEVEL | DESCRIPTION | INSTRUCTIONAL IMPLICATION |
|---------------------|--|--|
| Independent level | When reading, 1 out of 20 words is difficult. | Students at the independent reading level will be able to practice fluency activities alone or with peers. |
| Instructional level | When reading, 1 out of 10 words is difficult. | When a student at this level is working with his or her teacher, the fluency practice should be at the instructional level. |
| Frustrational level | When reading, more than 2 out of 10 words are difficult. | If reading is at a frustrational level, then the level of text should be made easier. Or, if a student struggles with reading passages, then the passages should be shortened. |

Source: The IRIS Center³⁸²

Teachers should also model fluent reading practices, provide opportunities for students to build fluency, and provide corrective feedback. The figure below lists additional tips for promoting reading fluency.³⁸³

Tips for Teaching Reading Fluency (Grade 1-3+)

- Keep in mind that being able to decode words is not enough for students to master fluency.
- Students must be able to decode words *effortlessly* and even to recognize sight-words automatically.
- Emphasize and model speed, accuracy, and expression.
- Provide opportunities for students to identify whether your reading sounds natural or unnatural.
- Provide fluency practice, and help students to either choose reading material at their independent or instructional level or else provide them with this material.
- Ask students to provide an example of a sentence read with speed, accuracy, and expression.
- Determine whether the students understand the fluency terms *speed*, *accuracy*, and *expression*.
- Reteach any concepts that the students do not understand.
- Motivate and encourage independent reading among students.
- Match students' reading levels to the appropriate text levels.
- Practice reading and rereading text.

Source: The Iris Center³⁸⁴

³⁸¹ Ibid.

³⁸² Figure text quoted verbatim from: Ibid.

³⁸³ Ibid.

³⁸⁴ Figure bullets quoted verbatim from: Ibid.

VOCABULARY

Instruction that increases students' vocabulary should occur across all grade levels. Vocabulary knowledge supports students' fluency and comprehension by improving word recognition. Teachers can use indirect and direct vocabulary instruction to build students' literacy skills in the general education classroom.³⁸⁵

- **Indirect vocabulary instruction** involves students' learning words and their meanings through daily conversations and through independent reading. Teachers need to consistently use new and interesting words as part of classroom instruction. More important, teachers need to read out loud to students and encourage them to read independently.
- **Direct vocabulary instruction** involves the intentional focus on words and their meanings. Teachers need to use a variety of methods to help students learn new vocabulary words directly.

Experts find that teachers must combine indirect and direct instruction to support adequate vocabulary development for elementary school students. While direct instruction supports students in learning new vocabulary, research indicates that students can only learn eight to 10 words per week through this method. However, research also suggests that elementary students should learn approximately 3,000 words per year, implying that students need to learn most new words indirectly. Indirect instruction includes introducing new vocabulary through daily interactions with students and introducing students to new words through songs, books, etc.³⁸⁶

Teachers may also focus on having students draw connections between what they know and words that they do not know. Word associations may be semantic or contextual.³⁸⁷ The following figure lists additional tips for vocabulary instruction below.

Tips for Vocabulary Instruction (All Grades)

- Be aware of factors that influence vocabulary instruction:
- Students' learning strengths and weaknesses
- Complexity of the words
- Students' familiarity with the concepts represented by new words
- Determine important vocabulary to teach before asking students to read about them in texts, and consider:
- How important the word is to the unit of study
- To what extent the word is useful outside the context of the lesson
- Whether there are words the students can learn on their own through the context of the lesson
- Whether there are words in the unit of study that may motivate students to learn other new words
- Provide repeated exposure to words.
- Develop activities that allow students to use words across different contexts.
- Engage students in discussions that include new vocabulary.
- Make available a number of good books (both narrative and expository) on a variety of topics.
- Encourage independent learning of new vocabulary from context.
- Teach meanings of prefixes, suffixes, and common root words.
- When teaching vocabulary directly, use a variety of strategies for teaching a word's meaning (e.g., simple definition, synonyms, antonyms, good examples and bad examples, models, pictures, demos).
- During vocabulary instruction, words should be introduced in a context with which students are already familiar.

³⁸⁵ Bullets quoted verbatim from: "Page 7: Vocabulary." The IRIS Center. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q3/p07/#content>

³⁸⁶ Ibid.

³⁸⁷ "Teaching Children to Read," Op. cit., p. 4.18.

- When both the word and the concept are unknown, the word should be taught explicitly in order to increase comprehension.

Source: The IRIS Center³⁸⁸

READING COMPREHENSION

Teachers across grade levels should provide students with specific strategies to facilitate reading comprehension. Reading comprehension is “the ability to understand written text,” which the NRP refers to as the “essence of reading.”³⁸⁹ Students require plenty of opportunities to practice strategies, most of which will require three or more lessons before students can use them independently. Teachers should use texts at the students’ independent reading levels when demonstrating strategies. If a text is too difficult, students will focus on decoding, rather than applying the strategy. The following figure lists strategies to improve reading comprehension that students can use before, during, and after the reading process.

Reading Comprehension Strategies

| PRE-READING | MID-READING | POST-READING |
|--|--|--|
| <ul style="list-style-type: none"> ▪ Predicting ▪ Preteaching new vocabulary ▪ Taking a book walk ▪ Activating prior knowledge | <ul style="list-style-type: none"> ▪ Using mental imagery ▪ Utilizing graphic organizers ▪ Creating and answering questions ▪ Monitoring comprehension | <ul style="list-style-type: none"> ▪ Summarizing ▪ Analyzing story elements ▪ Retelling ▪ Identifying main idea(s) |

Source: The IRIS Center³⁹⁰

Teachers should model reading comprehension strategies through explicit instruction. To provide explicit instruction in reading comprehension strategies, The IRIS Center recommends that teachers:³⁹¹

- Explain and discuss what strategy students should use, as well as when, where, and how to apply it
- Model the strategy
- Guide students in the strategy
- Allow students the time to practice the strategy on their own

Indeed, explicit instruction in literacy’s core elements is critical for providing Tier 1 support in the general education classroom. Explicit instruction is explored in greater detail below, along with strategies for differentiated instruction.

SUPPORTING INSTRUCTIONAL PRACTICES

Comprehensive literacy instruction should be direct and explicit, as well as differentiated to meet student needs. In alignment with other expert recommendations,³⁹² the RTI Action Center recommends that teachers: (1) “provide explicit and systematic instruction with lots of practice—with and without teacher

³⁸⁸ Figure bullets quoted from: “Page 7: Vocabulary,” Op. cit.

³⁸⁹ “Page 8: Reading Comprehension.” The IRIS Center. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q3/p08/#content>

³⁹⁰ Figure adapted from: Ibid.

³⁹¹ Bullets quoted verbatim from: Ibid., p. 8.

³⁹² For example, see: [1] “Page 2: High-Quality Instruction: Instructional Practices,” Op. cit., p. 2. [2] “Elements Comprising the Colorado Literacy Framework: IV. Purposeful, Direct, Explicit, and Systematic Instruction.” Colorado Department of Education. https://www.cde.state.co.us/coloradoliteracy/clf/EightElements_04-PurposefulInstruction.asp [3] Gersten, Compton, Connor, and Dimino, Op. cit., p. 17.

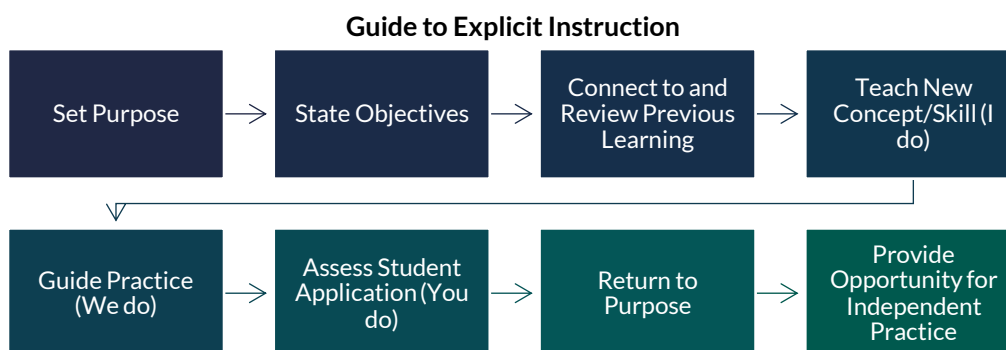
support and feedback, including cumulative practice over time;" and (2) "Provide differentiated instruction based on assessment results and adapt instruction to meet students' needs."³⁹³

DIRECT AND EXPLICIT INSTRUCTION

Research indicates that effective elementary literacy instruction provides "direct, explicit demonstrations of the cognitive strategies used by good readers when they read."³⁹⁴ While not all literacy instruction should be direct (e.g., vocabulary instruction should be both direct and indirect, as discussed above), the RTI Action Network finds that direct, explicit instruction in "decoding skills and strategies, fluency, [...] vocabulary word meanings and word-learning strategies, and comprehension strategies" promotes literacy outcomes, especially for students with weaker literacy skills.³⁹⁵ Similarly, the Colorado Department of Education (DOE) includes "purposeful, direct, explicit, and systematic instruction" as a one of the eight elements comprising the Colorado Literacy Framework. The Colorado DOE offers the following definitions of direct and explicit instruction:³⁹⁶

- **Direct Instruction:** The teacher defines and teaches a concept, models the learning process, guides students through its application, and arranges for extended guided practice until mastery is achieved.
- **Explicit Instruction:** Explicit instruction involves direct explanation. Concepts are clearly explained and skills are clearly modeled, without vagueness or ambiguity. The teacher's language is concise, specific, and related to the objective. Another characteristic of explicit instruction is a visible instructional approach which includes a high level of teacher/student interaction. Explicit instruction means that the actions of the teacher are clear, unambiguous, direct, and visible. This makes it clear what the students are to do and learn. Nothing is left to guess work.

Direct, explicit instruction models the strategies and thinking skills used by effective readers. Teachers may model strategies to the whole class, or to separate groups and individuals, based on needs.³⁹⁷ The following figure provides a guide to help teachers use explicit instruction during literacy lessons.



Source: Colorado DOE³⁹⁸

³⁹³ Denton, "Classroom Reading Instruction That Supports Struggling Readers: Key Components for Effective Teaching," Op. cit.

³⁹⁴ Allington, R. "The Six Ts of Effective Elementary Literacy Instruction." ReadingRockets. <http://www.readingrockets.org/article/six-ts-effective-elementary-literacy-instruction>

³⁹⁵ [1] Denton, "Classroom Reading Instruction That Supports Struggling Readers: Key Components for Effective Teaching," Op. cit. [2] Allington, "The Six Ts of Effective Elementary Literacy Instruction," Op. cit.

³⁹⁶ Bullets quoted verbatim from: "Elements Comprising the Colorado Literacy Framework: IV. Purposeful, Direct, Explicit, and Systematic Instruction," Op. cit.

³⁹⁷ Allington, "The Six Ts of Effective Elementary Literacy Instruction," Op. cit.

³⁹⁸ Figure adapted from: "Elements Comprising the Colorado Literacy Framework: IV. Purposeful, Direct, Explicit, and Systematic Instruction," Op. cit.

SYSTEMATIC INSTRUCTION WITH OPPORTUNITIES FOR PRACTICE

In addition to direct and explicit instruction, systematic instruction can support struggling students' literacy development as well. The RTI Action Network notes that "systematic instruction is carefully sequenced, so that easier skills are taught before more difficult skills."³⁹⁹ For example, in the early primary grades, educators may teach letter-sound correspondences and phonics skills in a specific and logical order, allowing students to master key skills before exposing them to new material. Progress monitoring allows teachers to identify skills that need re-teaching and to tailor the pace of instruction. Teachers should also allow for ample opportunities to practice literacy skills and strategies, both in a guided and independent setting. During guided practice, teachers should provide both corrective and positive feedback. Regular cumulative practice, where students practice both new skills and learned skills, is likely necessary for students with reading difficulties.⁴⁰⁰

DIFFERENTIATED INSTRUCTION

Teachers must differentiate their literacy instruction to meet the varied needs, skill sets, and ability levels of diverse learners. The IRIS Center describes differentiated instruction as "the use of flexible teaching approaches in the classroom to accommodate the individual learning needs of all students."⁴⁰¹ Teachers can use assessment and other progress monitoring data to adjust instruction to target students' specific learning goals (whether they are gifted, high-achieving students, or have reading difficulties).⁴⁰² Flexible grouping allows teacher to target different groups of students with tailored instruction; for example, students with weak vocabulary skills might practice in partners or small groups, while another group of students discuss the book they are reading that week.⁴⁰³ Small groups can include students of the same ability or of mixed abilities, and should be constructed based on consideration of the educational needs and interests listed in the figure below.⁴⁰⁴ For further reference, this report's appendix on pages 89 to 91 presents a sample daily literacy instructional plan with whole-class, small-group, and paired grouping.

Flexible Grouping: Considering Students' Educational Needs and Interests

| EDUCATIONAL NEEDS | INTERESTS |
|--|--|
| <ul style="list-style-type: none">Group members should occasionally be rotated so that students are not relegated to one permanent group (e.g., Tad is always in the "low" group).Groups can be formed both with students with mixed abilities and those with similar abilities.In the case of paired instruction, struggling students should be paired with more capable readers, but differences in ability should not be too great. | <ul style="list-style-type: none">Taking into account students' interests when forming groups can increase motivation, which in turn improves academic performance.As students' needs and interests change, group membership should change accordingly. |

Source: The IRIS Center⁴⁰⁵

TIER 1 LITERACY INSTRUCTION FOR SECONDARY STUDENTS

While the RTI model for literacy is implemented in the secondary grades less frequently, districts may select this approach to ensure effective schoolwide literacy instruction and supports for adolescent learners.⁴⁰⁶ This section discusses Tier 1 literacy instruction for secondary students with a focus on content area literacy, and

³⁹⁹ Denton, "Classroom Reading Instruction That Supports Struggling Readers: Key Components for Effective Teaching," Op. cit.

⁴⁰⁰ Ibid.

⁴⁰¹ "Page 2: High-Quality Instruction: Instructional Practices," Op. cit.

⁴⁰² Ibid.

⁴⁰³ Gersten, Compton, Connor, and Dimino, Op. cit., p. 17.

⁴⁰⁴ "Page 2: High-Quality Instruction: Instructional Practices," Op. cit.

⁴⁰⁵ Figure text quoted verbatim from: Ibid., p. 2.

⁴⁰⁶ Ehren, "Response to Intervention in Secondary Schools: Is It on Your Radar Screen?," Op. cit.

then identifies specific cross-discipline strategies to promote adolescent literacy. The report concludes with a deeper discussion on content area writing given its importance for building literacy skills in older students.

OVERVIEW

Students should continue to receive high-quality instruction to support the development of literacy skills throughout middle and high school. In a 2007 report on literacy for secondary content area teachers, the Alliance for Excellent Education (Alliance) notes that “without ongoing literacy instruction, students who are behind in reading when they enter the middle grades likely will never catch up.”⁴⁰⁷ Even students who enter middle school reading at grade level may later struggle to read and understand academic materials fluently without continued, high-quality literacy instruction.⁴⁰⁸ As Rafael Heller states in an article on adolescent readers:⁴⁰⁹

Even if they’ve mastered the basics in the first few years of school, students still need to be taught how to make sense of the varied and increasingly difficult materials they encounter in the science, history, math, English, and other subject area classes that comprise the middle and high school curriculum. They must be taught how to write clear, compelling texts of their own. And they must be taught how to communicate effectively for many different audiences, both in and outside of school, using all sorts of tools, from pen and paper to the spoken word to the latest electronic media.

Consequently, experts and education organizations, including the National Institute for Literacy (NIL), find that **“literacy instruction should continue beyond the elementary years and should be tailored to the more complex forms of literacy that are required of adolescent students in the middle and high school years.”**⁴¹⁰

CONTENT AREA LITERACY

Supporting secondary students’ literacy development should be the responsibility of all instructional, support, and administrative staff, not only English/language arts (ELA) teachers and reading specialists.⁴¹¹ Although the Alliance states that “literacy stands at the heart of the academic content areas,” many secondary teachers receive minimal training in literacy instruction.⁴¹² Content area teachers typically consider themselves as instructors of their specific subject (e.g., history, math, and science) and even English teachers may consider themselves primarily teachers of literature, rather than reading and writing.⁴¹³ However, an effective RTI approach to literacy instruction relies on high-quality literacy instruction in general education classrooms.⁴¹⁴ As the RTI Action Network states, “secondary teachers have to recognize and accept their roles with literacy for all students, not just those who struggle; connections must be made between content mastery and content literacy.”⁴¹⁵

Content area teachers need to provide instruction in both general reading and discipline-specific reading strategies. The Alliance finds that **teaching generic reading strategies across disciplines can support students’ ability to comprehend a variety of types of text.** Indeed, research indicates that teaching comprehension strategies, text structures, and word-level strategies is most effective “while students are

⁴⁰⁷ “Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement.” Alliance for Excellent Education, 2007. p. 2. <http://all4ed.org/wp-content/uploads/2007/06/LitCon.pdf>

⁴⁰⁸ Ibid.

⁴⁰⁹ Quoted verbatim from: “Adolescent Literacy 101.” AdLit.org. http://www.adlit.org/adlit_101/

⁴¹⁰ “What Content Area Teachers Should Know About Adolescent Literacy.” National Institute for Literacy. p. 1. https://www.nichd.nih.gov/publications/pubs/documents/adolescent_literacy07.pdf

⁴¹¹ [1] Ibid.

⁴¹² [1] “Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement,” Op. cit., p. 6. [2] Heller, R. “Teaching Reading and Writing in Content Areas.” AdLit.org. http://www.adlit.org/adlit_101/improving_literacy_instruction_in_your_school/teaching_reading_and_writing_content_areas/

⁴¹³ Heller, Op. cit.

⁴¹⁴ Hougen, M. “Evidence-Based Reading Instruction for Adolescents Grades 6-12.” The CEEDAR Center, 2015. pp. 11–12. http://ceedar.education.ufl.edu/wp-content/uploads/2015/05/IC-13_FINAL_05-26-15.pdf

⁴¹⁵ Ehren, “Response to Intervention in Secondary Schools: Is It on Your Radar Screen?,” Op. cit.

engaged in reading challenging, content-rich texts.”⁴¹⁶ However, not all literacy skills are applicable across content areas: subjects as varied as English and math, for example, require content-specific instruction in reading comprehension and effective writing strategies.⁴¹⁷ As such, content area teachers should apply both generic and discipline-focused literacy instruction to support students’ “comprehension and evaluation” of a variety of texts (e.g., textbooks, chapter books, and journal or newspaper articles).⁴¹⁸ The following figure lists a sample of generic and discipline-specific reading strategies.

Generic and Discipline-Specific Reading Strategies

| GENERIC READING STRATEGIES | DISCIPLINE-SPECIFIC STRATEGIES |
|--|---|
| <ul style="list-style-type: none"> ▪ Monitor comprehension ▪ Pre-read ▪ Set goals ▪ Think about what one already knows ▪ Ask questions ▪ Make predictions ▪ Test predictions against the text ▪ Re-read ▪ Summarize | <ul style="list-style-type: none"> ▪ Build prior knowledge ▪ Build specialized vocabulary ▪ Learn to deconstruct complex sentences ▪ Use knowledge of text structures and genres to predict main and subordinate ideas ▪ Pose discipline relevant questions ▪ Map graphic (and mathematical) representations against explanations in the text ▪ Compare claims and propositions across texts ▪ Use norms for reasoning within the discipline (i.e., what counts as evidence) to evaluate claims |

Source: AdLit.org⁴¹⁹

Effective content area teachers develop students’ literacy skills during daily instruction and learning. Teachers should establish classroom routines that promote the development and frequent use of literacy skills. Rather than assigning a reading assignment paired with questions, for instance, “literacy-rich, content area classrooms include a variety of instructional routines that provide guidance to students before, during and after reading.”⁴²⁰ Teachers may model how to comprehend or interpret a text during class, employ various tools that engage students in using generic reading strategies, and organize instruction into routines that support literacy skill development more generally. The figure below presents a more comprehensive list of practices and tools that can be used in the classroom to build content knowledge and literacy skills.

⁴¹⁶ “Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement,” Op. cit., p. 8.

⁴¹⁷ Ibid., p. 10.

⁴¹⁸ Lee, C. and A. Spratley. “Teaching Content Knowledge and Reading Strategies in Tandem.” AdLit.org. <http://www.adlit.org/article/34644/>

⁴¹⁹ Figure text quoted verbatim from: Ibid.

⁴²⁰ Ibid.

Practices and Tools to Build Content Knowledge and Literacy Skills

| PRACTICES THAT BUILD CONTENT KNOWLEDGE AND LITERACY SKILLS | TOOLS THAT ENGAGE STUDENTS IN GENERIC READING STRATEGIES |
|---|--|
| <ul style="list-style-type: none"> ▪ Reinforce conceptions of reading as a meaning-making process; ▪ Provide guided support for making sense while students are engaged in acts of reading; ▪ Shift responsibility for thinking and making sense of texts to students themselves through guided supports in both small and whole group work; ▪ Sequence discipline-specific inquiry tasks and the reading of a range of discipline-focused texts in ways that build knowledge over time; ▪ Focus classroom talk on how students make sense of texts and how they use what they learn from texts to carry out discipline-specific thinking tasks; ▪ Provide consistent supports so that students experience success and develop or reinforce their sense of efficacy as readers. | <ul style="list-style-type: none"> ▪ Double-entry journals where students post questions, observations of patterns in the texts, summarize, make connections; ▪ K-W-L — a graphic where students identify what they already know (K), what they want to know (W) and after reading what they have learned (L); ▪ Graphic organizers that use text structures to guide what kinds of information students are reading for or that map out the kinds of semantic knowledge students need to understand vocabulary (synonyms, antonyms, examples, attributes, morphemic analysis); ▪ Anticipation Guides that list key ideas (including ideas that are counter-intuitive or controversial) that the teacher wants students to interrogate in reading a given text and to re-visit after reading; ▪ Annotation of texts to pose questions, mark main ideas, make predictions, mark reactions; ▪ Analyzing question types; ▪ Support for producing self-explanations. |

Source: AdLit.org⁴²¹

STUDENT MOTIVATION

Secondary teachers should follow practices that foster motivated and engaged readers and writers. The NIL notes that while “engaged readers and writers are always motivated,” adolescents may lose motivation “due to poor skills or insufficient background knowledge of the topic.” As middle and high school grading practices encourage students to judge themselves in regard to their peers, struggling readers and writers may be increasingly aware of their difficulties, possibly decreasing their motivation.⁴²² Consequently, experts recommend that content area teachers specifically “design reading and writing assignments that are likely to motivate students who lack engagement in school activities.”⁴²³ To affect student motivation positively and support literacy outcomes, teachers should:⁴²⁴

- **Set clear goals and expectations for performance.** Goals and expectations for reading and writing assignments should be clear and specific. Provide guidance by giving examples of strategies that students can use in reading the chapter and relate that to successful participation in the discussion to enhance motivation for performing the reading activity.
- **Provide variety and choice in reading materials.** The textbooks used in many secondary level classrooms often do not hold students’ interests. Teachers can provide students with other reading materials that interest them and that pertain to the subjects that they teach.
- **Provide opportunities for students to interact through reading.** To provide students with opportunities for interaction, teachers can: (1) create opportunities for small groups of students to discuss their reading; (2) structure groups carefully so that students with differing abilities are able to talk about a common topic; and (3) offer different viewpoints or information on that topic.

⁴²¹ Figure text quoted verbatim from: Ibid.

⁴²² “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., pp. 35–36.

⁴²³ Heller, Op. cit.

⁴²⁴ Bullets quoted verbatim from: “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., pp. 36–37.

CROSS-DISCIPLINE LITERACY INSTRUCTION

Secondary content area teachers should provide instruction that supports the key components of literacy. The NIL identifies five key components that support adolescents' reading proficiency, much of which overlap and build on primary students' core literacy skills: decoding, morphology, fluency, vocabulary, and text comprehension. While these mirror the elements of comprehensive primary instruction discussed in Section II, the NIL argues that teachers should continue to provide instruction that addresses these components through middle and high school.⁴²⁵ As the Collaboration for Effective Educator Development, Accountability, and Reform (CEEDAR) Center notes, "school wide, all teachers must know how to apply the most efficacious strategies to support reading achievement, particularly vocabulary and comprehension instruction, across all content areas."⁴²⁶ Accordingly, the NIL discusses strategies for supporting literacy outcomes in content area classrooms tailored to the secondary level. While implementation of specific strategies may vary by content area, the strategies highlighted in the following subsections intend to support teachers across all content areas.⁴²⁷

DECODING AND MORPHOLOGY

Content teachers may incorporate decoding into general instruction for secondary students. The NIL identifies decoding as a key component of comprehensive instruction for adolescents, but notes that intensive instruction in decoding is often "most feasibly" taught by support staff (e.g., a literacy specialist) to selected students, rather than within content area courses.⁴²⁸ Nonetheless, the CEEDAR Center recommends that "core content teachers [...] incorporate word decoding in their general instruction for all students."⁴²⁹ For example, "teachers can develop a routine for decoding unfamiliar words in their content areas, breaking the words into syllables and providing practice reading the words, saying the words aloud, and discussing the meaning of the words to help students retain the words."⁴³⁰

Similarly, content area teachers can integrate aspects of morphology to support vocabulary building and reading comprehension. The NIL notes that "learning morphemes helps students particularly in the upper elementary grades and beyond as they encounter more unfamiliar words and morphologically complex words across their expository textbooks and narrative literature as well as in spelling tasks."⁴³¹ While formal instruction is beyond the scope of most content area secondary teachers, the NIL recommends that instructors discuss morpheme patterns related to subject-specific vocabulary. For example, content area teachers might provide explicit instruction in base words, prefixes and suffixes, and compound words during vocabulary building exercises. ELA teachers may also provide more explicit or formal instruction in morphology.⁴³²

FLUENCY

Secondary teachers should demonstrate and provide opportunities for students to practice oral reading. The NIL recommends that teachers regularly model fluent reading by reading aloud from class texts, cautioning that "teachers should not feel that oral reading in middle and high school classes is no longer necessary."⁴³³ General education teachers can promote fluency through wide reading (i.e., reading a wide variety of texts), as well as through the following techniques:⁴³⁴

⁴²⁵ Ibid., pp. 1–3.

⁴²⁶ Hougen, Op. cit., pp. 11–12.

⁴²⁷ "What Content area Teachers Should Know About Adolescent Literacy," Op. cit., pp. 1–3.

⁴²⁸ Ibid., p. 3.

⁴²⁹ Hougen, Op. cit., p. 19.

⁴³⁰ Ibid., pp. 19–20.

⁴³¹ "What Content area Teachers Should Know About Adolescent Literacy," Op. cit., p. 9.

⁴³² Ibid., pp. 9–10.

⁴³³ Ibid., p. 12.

⁴³⁴ Bullets quoted verbatim from: Hougen, Op. cit., pp. 23–24.

- **Choral reading** of short passages in which students read text aloud in unison with the teacher.
- **Close reading** in which the teacher reads while students follow along silently; the teacher randomly pauses, and the students read the omitted word aloud.
- **Repeated reading** in which students reread the same material several times. This practice can be made more interesting if the students are preparing to read aloud for others (e.g., performing a play, reading to younger students, recording themselves reading).
- **Structured partner** reading in which students take turns reading and giving feedback.
- **Scaffolded, structured silent reading** in which students have a purpose for reading, and the teacher monitors their progress.

VOCABULARY

Content area teachers should provide vocabulary instruction in their subject areas. Lessons on vocabulary “should be fast-paced, brief, multi-sensory, and interactive (i.e., allow students to see and write new words as well as to hear and speak these words).”⁴³⁵ The NIL and CEEDAR Center both recommend that secondary educators provide explicit, direct, and systematic instruction in vocabulary.⁴³⁶ Explicit instruction for content area vocabulary involves the following steps:⁴³⁷

- Explain word meanings and model usage of difficult content area vocabulary in sentences that are relevant to the subject matter concepts that students are currently learning.
- Guide students to practice using the vocabulary in different sentences and contexts and provide corrective feedback.
- Provide time for independent practice with the vocabulary – peer tutoring, reciprocal teaching, and collaborative learning.
- Repeat these instructional steps until students are able to use the new vocabulary independently in their reading and writing.

Students require repeated exposure to master new vocabulary. Teachers can use words repeatedly and in varied contexts. For example, “within the context of explaining new concepts, giving directions, or summarizing ideas,” teachers may repeat new vocabulary multiple times. Pronouncing words slowly and leaving a pause after saying them may help some students to identify and comprehend the new word.⁴³⁸ Another strategy requires placing students in small groups to discuss new vocabulary, develop word maps to illustrate the relationships between words and concepts, and use words in various contexts, before sharing with the class.⁴³⁹

Teachers can provide vocabulary instruction for both specialized and non-specialized academic words.⁴⁴⁰ Teachers may point out that specific non-specialized academic words are commonly used when discussing certain content. As an example, Heller writes that “when reading about or discussing the causes of the civil war, [a teacher may] point out and model usage of such words as cause, consequence, relationship, etc.”⁴⁴¹ When choosing non-specialized academic words to pre-teach, teachers should consider:⁴⁴²

⁴³⁵ “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., p. 17.

⁴³⁶ [1] Ibid. [2] Hougen, Op. cit., pp. 31–32.

⁴³⁷ Bullets quoted verbatim from: “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., p. 17.

⁴³⁸ Heller, Op. cit., pp. 17–18.

⁴³⁹ Ibid.

⁴⁴⁰ “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., p. 16.

⁴⁴¹ Heller, Op. cit., pp. 17–18.

⁴⁴² Bullets quoted verbatim from: “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., p. 16.

- Importance of the word for understanding the text;
- Students' prior knowledge of the word and the concept to which it relates;
- The existence of multiple meanings of the word (e.g., meter in poetry, mathematics, and science); and
- Opportunities for grouping words together to enhance understanding a concept.

Graphic organizers are also effective as students learn the meaning of words through visual manipulation. The CEEDAR Center highlights verbal and visual word associations, semantic maps, and vocabulary frames as three examples.⁴⁴³ Teachers can also improve students' retention of new vocabulary through the principles listed in the following figure.

Additional Strategies to Improve Students' Retention of New Vocabulary

| STRATEGY | DESCRIPTION |
|--|---|
| Learn new words with deep understanding | The selected words are learned well. Students know examples and non-examples, word origins, derivations, and word families. In-depth learning ensures that students will be able to remember and use the words. |
| Connect to what students know | If students have the conceptual background to understand a word, they can learn the meaning of any word. Teachers must connect the new concept to what students already know and build upon that knowledge. |

Source: The CEEDAR Center⁴⁴⁴

TEXT COMPREHENSION

Teachers must provide instruction in reading comprehension strategies to ensure that students understand classroom texts.⁴⁴⁵ The NIL states that "the goal of text comprehension instruction is to help students become active, purposeful, and independent readers of science, history, literary, and mathematics texts," and research indicates that comprehension strategies can support this goal across subject-areas.⁴⁴⁶ Of course, texts and relevant comprehension strategies will vary by content area; that is, comprehending a science text will differ from comprehending a history text, and both will differ from comprehending a novel.⁴⁴⁷ However, the NIL finds that several strategies – including question generation and answering, comprehension monitoring, summarizing texts – can support students' text comprehension across subject-areas. The following figure lists and describes important cross-discipline text comprehension strategies.

Text Comprehension Strategies for Content area Teachers (Secondary)

| STRATEGY | DESCRIPTION |
|--------------------------|---|
| Generate Question | <p>Generating questions is a way to process text and monitor comprehension. Teachers can integrate instruction in generating questions into their lessons using the following steps:</p> <ul style="list-style-type: none"> ■ Read aloud passages from subject-matter text; ■ As you read, stop now and then to model the kinds of questions successful readers ask themselves as they read. For example, "Why does the author tell me this?" "Did I understand this correctly?" "What seems to be the most important point or idea?"; ■ Repeat this modeling several times with different texts; and ■ Guide students in generating their own questions with content area texts. |

⁴⁴³ Hougen, Op. cit., pp. 32–33.

⁴⁴⁴ Figure text quoted verbatim from: Ibid., p. 27.

⁴⁴⁵ Heller, Op. cit.

⁴⁴⁶ "What Content area Teachers Should Know About Adolescent Literacy," Op. cit., p. 20.

⁴⁴⁷ Hougen, Op. cit., pp. 52–56.

| STRATEGY | DESCRIPTION |
|--|--|
| Answer Question | Teachers can use question-answering instruction to help students improve how they answer questions, which will, in turn, help them better understand what they read. In question-answering instruction, teachers must create opportunities for question answering and must also help students to determine the kind of response called for by the question. The teacher must then model how to construct various responses. |
| Monitor Comprehension | <p>Expert readers monitor their comprehension as they read by continuously identifying when they do and when they do not comprehend the information, ideas, and other messages contained in the text. When comprehension breaks down, expert readers are able to use comprehension monitoring or other problem-solving strategies to help them comprehend. To model the use of monitoring strategies, use the following steps:</p> <ul style="list-style-type: none"> ▪ Read aloud selected text passages; ▪ Stop at various points to “think aloud” about what may or may not be understood. An example of how questioning, prediction, and summarizing are used as monitoring strategies is given in the box below; and ▪ Provide examples of other problem-solving strategies and how they are used in response to comprehension difficulties. Examples of problem-solving strategies include re-reading the text, asking oneself questions about the text, and reading before or after the portion of text where comprehension difficulties occurred. |
| Summarize Text | <p>Summarizing helps students focus on the important content of a text, determine what is important and what is not important, condense the important content, and restate this content in their own words. There are four components of the summarizing strategy:</p> <ul style="list-style-type: none"> ▪ Identify and/or formulate main ideas; ▪ Connect the main ideas; ▪ Identify and delete redundancies; and ▪ Restate the main ideas and connections using different words and phrasings. |
| Use Text Structure | <p>As adolescents build their knowledge of science, social studies, mathematics, and literature, learning to use knowledge of the structure of the particular text helps them comprehend the more complex texts that they encounter in these disciplines. Selecting strategies that are useful for comprehending text structures involves examining the content, language, and structure of text with which students may have difficulty and then identifying specific strategies that will help students use these patterns and structures to aid in comprehension.</p> <ul style="list-style-type: none"> ▪ Teachers can identify words that function as signal or transition words for a particular text structure. For example, common signal and transition words for cause/effect structures include <i>because</i>, <i>since</i>, <i>consequently</i>. |
| Use Graphic and Semantic Organizers | Teach students how to use graphic and semantic organizers to help them organize ideas and concepts during and after reading. Graphic organizers are diagrams or other visuals that help students identify and see the relationships among concepts, ideas, and facts in a text. |

Source: NIL⁴⁴⁸

CONTENT AREA WRITING

Beyond these cross-discipline strategies for literacy instruction, as touched on above, content area teachers should provide writing instruction specific to their discipline.⁴⁴⁹ That is, while cross-discipline instructional strategies should support secondary students’ writing and reading, teachers should instruct in writing styles, expectations, and skills as they vary across content areas in accordance with academic disciplines’ “own set of characteristic literacy practices.”⁴⁵⁰ However, experts note that non-English/language arts teachers are *not* responsible for teaching: (1) grammar, usage, mechanics, and spelling (apart from

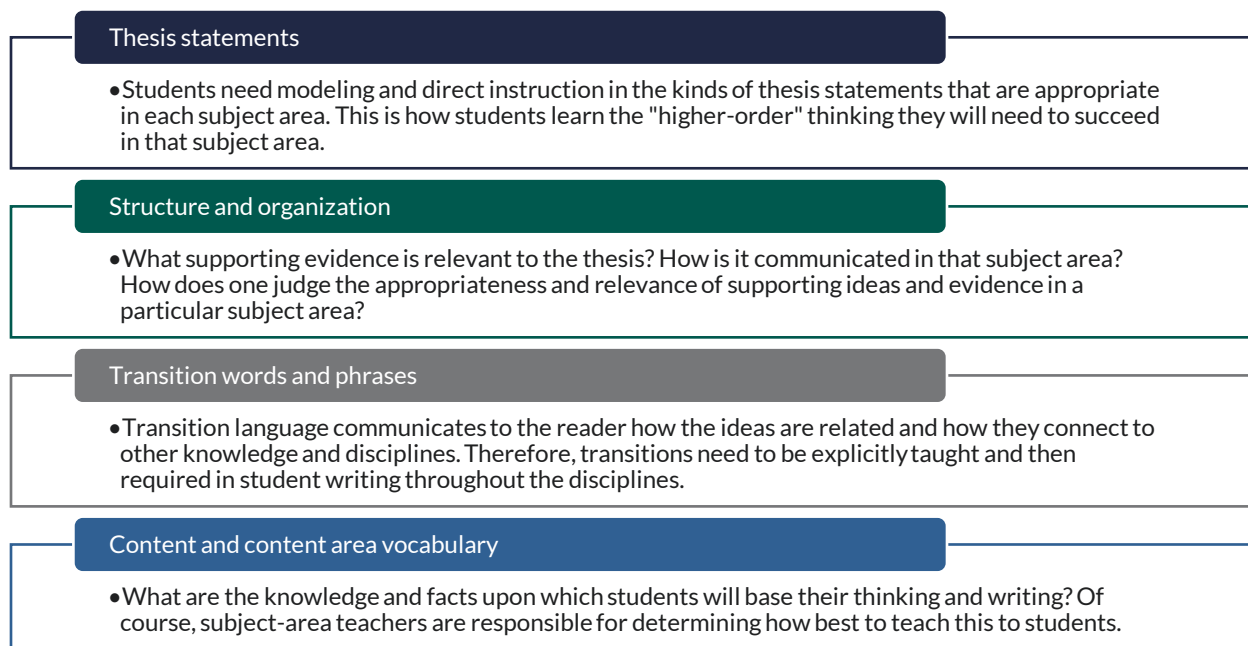
⁴⁴⁸ Figure text quoted verbatim with minor modifications from: “What Content area Teachers Should Know About Adolescent Literacy,” Op. cit., pp. 20–26.

⁴⁴⁹ Heller, Op. cit.

⁴⁵⁰ “Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement,” Op. cit., pp. 7–10.

subject-specific vocabulary); (2) style and voice; or (3) “literary narrative writing.”⁴⁵¹ Instead, teachers of these subjects are responsible for the “elements of writing that reflect thinking in their subject areas,” such as those listed in the figure below.⁴⁵²

Discipline-Specific Elements of Writing



Source: AdLit.org⁴⁵³

While students across disciplines are expected to write analytically, the structure of (and expectations for) an analytical essay vary by content area. For reference, the figure below describes the structural elements common to analytical writing across English/language arts, history/social studies, science, and math.

Elements of Analytic Writing by Content area (Grades 9-12)

| CONTENT AREA | THESIS STATEMENT | EVIDENCE/PROOF | CONCLUSION | COMMON TEXT STRUCTURES |
|---------------------------|------------------|--|------------|---|
| English/ Language Arts | Thesis Statement | <ul style="list-style-type: none"> ▪ Quotations from text(s) ▪ Examples from and between text(s) ▪ Analysis by literary critics | Conclusion | <ul style="list-style-type: none"> ▪ Compare-Contrast ▪ Concept Definition ▪ Proposition Support ▪ Cause-Effect |

⁴⁵¹ Stempel, A. "Analytical Writing in the Content Areas." AdLit.org. <http://www.adlit.org/article/39749/>

⁴⁵² Ibid.

⁴⁵³ Figure adapted from: Ibid.

| CONTENT AREA | THESIS STATEMENT | EVIDENCE/PROOF | CONCLUSION | COMMON TEXT STRUCTURES |
|----------------------------|---|---|---|--|
| History/ Social Studies | Thesis Statement or Historical Argument | <ul style="list-style-type: none"> Historical examples from primary sources Interpretations from historians (secondary sources) Examples of past events or predictions based on prior examples | Conclusion or Historical Interpretation | <ul style="list-style-type: none"> Cause-Effect Compare-Contrast Concept Definition Proposition Support |
| Science | Hypothesis: What is being proved? | <ul style="list-style-type: none"> Experimental results of others Students' own experimental results | Results / Analysis Conclusion: Was the hypothesis proven or disproven? How and why? | <ul style="list-style-type: none"> Goal-Action-Outcome (lab report) Cause-Effect Compare-Contrast Concept Definition |
| Math | Goal Statement: What is being solved | <ul style="list-style-type: none"> Calculations Logic proofs Analysis linked using transitional phrases | Outcome Statement (one sentence) What is the answer to the problem in context? | <ul style="list-style-type: none"> Goal-Action-Outcome Cause-Effect Compare-Contrast Concept Definition |

Source: AdLit.org⁴⁵⁴

APPENDIX

The figure below provides an overview of Tier 2 and 3 instruction in literacy for primary students.

Overview of Tier 2 and 3 Instruction in Literacy (Primary Level)

| CATEGORY | TIER 2 INSTRUCTION | TIER 3 INSTRUCTION |
|------------------------------|---|---|
| Who receives instruction | Students who are not making adequate progress with Tier 1 instruction | Students who are not making adequate progress with Tier 2 intervention |
| Amount of daily instruction | <p>Instruction may vary, depending on the age of the student, from 30-45 minutes per day (+ Tier 1):</p> <ul style="list-style-type: none"> Younger students (e.g., kindergartners) have shorter attention spans and might require shorter amounts of time (e.g., 30 minutes) Older students are able to attend for longer amounts of time (e.g., 30-45 minutes) | Instruction may vary, depending on the age of the student, from 40-60 min. per day (+ Tier 1) |
| When instruction is provided | <p>Scheduling options for Tier 2 could include:</p> <ul style="list-style-type: none"> Taking time from two consecutive classes (e.g., 15 minutes from social studies and 15 minutes from science) Taking time from "specials" (e.g., music, library, art) <p><i>In the event that a large percentage of students requires Tier 2, the teacher might need to schedule more than one Tier 2 intervention period per day.</i></p> | Scheduling options for Tier 3 might include: |

⁴⁵⁴ Figure adapted from: Ibid.

| CATEGORY | TIER 2 INSTRUCTION | TIER 3 INSTRUCTION |
|---|---|--|
| Duration of instruction | 10 weeks to 20 weeks: <ul style="list-style-type: none"> The number of weeks may vary, but a minimum of 10–12 weeks is recommended. Students may need an additional round of Tier 2 intervention. | Tier 3 intervention twice a day (e.g., 20 minutes in the morning and 20 minutes in the afternoon) |
| How instruction is implemented | Instruction should be implemented with teacher/ student ratios of 1:3–1:5. | Tier 3 intervention at the same time as another teacher provides the Tier 2 intervention to other students |
| Frequency of progress monitoring | At least one time every 1–2 weeks | Varies by individual—may be several semesters or even years |
| Who provides instruction | Trained personnel may include: <ul style="list-style-type: none"> General education teacher Reading specialist Paraprofessionals Other personnel | Instruction should be implemented with teacher/ student ratios of no more than 1:3. |
| Where students are served | Within or outside the general education classroom | At least one time every 1–2 weeks |

Source: The IRIS Center⁴⁵⁵

The following figure presents a sample daily literacy instruction plan that relies on flexible grouping (based on an early primary-level class of 22 students). The IRIS Center notes that in this example, small-group instruction is based on ability, while paired instruction groups students of mixed ability levels.⁴⁵⁶

Sample Daily Literacy Instruction Plan – Flexible Grouping

| TIME | INSTRUCTIONAL GROUPING | |
|------------|--|---|
| 9:00-9:10 | Whole-group instruction 10 minutes | |
| 9:10-9:30 | Small-group instruction Group 1, 20 minutes | Learning centers Group 2, 20 minutes |
| | | Independent practice Group 3, 20 minutes |
| 9:30-9:50 | Small-group instruction Group 2, 20 minutes | Learning centers Group 3, 20 minutes |
| | | Independent practice Group 1, 20 minutes |
| 9:50-10:10 | Small-group instruction Group 3, 20 minutes | Learning centers Group 1, 20 minutes |
| | | Independent practice Group 2, 20 minutes |

⁴⁵⁵ Figure adapted from: [1] "Page 11: Effective Instruction at Tier 2." The IRIS Center, 2006. p. 2. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q4/p11/#content> [2] "Page 12: Effective Instruction at Tier 3." The IRIS Center. <https://iris.peabody.vanderbilt.edu/module/rti03-reading/cresource/q4/p12/#content>

⁴⁵⁶ "Page 10: Effective Instruction at Tier 1," Op. cit.

| TIME | INSTRUCTIONAL GROUPING |
|-------------|---|
| 10:10-10:20 | Paired instruction (Complete progress monitoring with five students per day) <i>10 minutes</i> |
| 10:20-10:30 | Whole-group instruction <i>10 minutes</i> |

Source: The IRIS Center⁴⁵⁷

⁴⁵⁷ Figure adapted from: Ibid.

SECTION IV: MATH—ELEMENTARY & SECONDARY

In this section, Hanover presents the Response to Intervention framework in a mathematics context as well as intervention strategies and tools that teachers may implement to support students. The following reports divide this information by elementary and secondary students to differentiate the tools implemented at each grade level.

REPORT I: BEST PRACTICES FOR K-5 MATH INSTRUCTION AND INTERVENTION

INTRODUCTION

Research shows that early math interventions can help reduce future achievement deficits for struggling students.⁴⁵⁸ To ensure later success in algebra and other foundational courses, students need to develop foundational math skills. However, a significant number fail to do so. A national survey of algebra teachers found, for instance, that many students entering algebra are deficient in the areas of whole number arithmetic, fractions, ratios, and proportions.⁴⁵⁹ Therefore, many school districts use a Response to Intervention (RTI) model to identify struggling students and guide successful math interventions. To support districts' math intervention services, this report synthesizes research on effective math intervention strategies for elementary school students.

STRATEGIES FOR IMPROVING THE MATH ACHIEVEMENT OF STRUGGLING STUDENTS

The following section discusses effective, research-based math instructional strategies for elementary school students. Notably, the body of literature does not differentiate greatly between the use of these strategies with all students and with students struggling with math; rather the strategies serve as best practices for instruction that can be delivered with different levels of intensity according to students' needs.

INSTRUCTIONAL STRATEGIES

High-quality math instruction is essential to the math success of all student, as students who struggle with math in elementary school do not develop the necessary skills to succeed in critical later math courses, such as algebra. Therefore, it is essential that students receive effective instruction and intervention to “mitigate and prevent mathematics difficulties.”⁴⁶⁰

Successful instructional practice can be gleaned from successful schools. A U.S. Department of Education summary of Blue Ribbon schools who have dramatically improved their students' math performance revealed common practices in curriculum content and standards, teaching strategies, student support, and assessment. The figure below describes the successful practices common to these schools. Notably, while the schools follow different math programs, they all **emphasize an aligned curriculum, dedicated time for math instruction and assessment, formative assessment and progress monitoring, and immediate intervention for struggling students.**⁴⁶¹

⁴⁵⁸ VanDerHeyden, A. “RTI and Math Instruction.” RTI Action Network. <http://www.rtinetwork.org/learn/what/rtiandmath>

⁴⁵⁹ Gersten, R., S. Beckmann, B. Clarke, A. Foegen, and L. Marsh. “Assisting Students Struggling with Mathematics: Response to Intervention (RTI) for Elementary and Middle Schools.” U.S. Department of Education, Institute of Education Sciences, April 2009. p. 4. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/rti_math_pg_042109.pdf

⁴⁶⁰ Ibid.

⁴⁶¹ “Improving Math Performance.” U.S. Department of Education. <https://www2.ed.gov/programs/nclbbrs/math.pdf>

Strategies for Improving Math Performance

| CATEGORY | DESCRIPTION | SUCCESSFUL PRACTICES |
|---|---|---|
| Curriculum Content and Standards | The math curriculum is coherent, focused, demanding, and reflects the logical and sequential nature of math. Students move from mastering basic computational skills and number concepts to more complex ideas and mathematical reasoning, including problem-solving. All teaching is aligned with district and state standards in mathematics. | <ul style="list-style-type: none"> Curriculum is aligned with state frameworks; Coherent, focused, demanding program; Connections to the real world; Year-to-year continuity; Building on prior skills and knowledge; and Use of manipulatives for concept development. |
| Teaching Strategies | High-quality teachers provide individual instruction through differentiated instruction, flexible grouping, and immediate intervention. | <ul style="list-style-type: none"> Ongoing assessment; Differentiated instruction; Flexible grouping; Teacher collaboration; Year-to-year continuity; and Ongoing professional development. |
| Student Support | Students' math instruction is supported through data-driven decision making and collaboration between teachers and between teachers and parents. | <ul style="list-style-type: none"> Early intervention; Frequent parent-teacher conferences; Home strategies; Extended day programs; Tutoring; and Summer workshops. |
| Assessment | Formative, continuous assessment guides mathematics instruction, informs instructional planning for individual student needs, and suggests where a given teacher might improve a lesson. | <ul style="list-style-type: none"> Diagnostic screening; Individual instruction based on assessment data; Teaching guided by assessment data; Performance assessment; and Ongoing assessment. |

Source: U.S. Department of Education⁴⁶²

Research further indicates that educators can use a variety of instructional strategies to positively impact the math achievement of struggling and low-income students. For example, the Institute of Education Science's (IES) What Works Clearinghouse (WWC) produced a practice guide for implementing math strategies within the RTI framework highlighted above. Based on the input of a diverse panel of experts and researchers in addition to an analysis of experimental and quasi-experimental studies meeting WWC's strict criteria, the guide offers eight recommendations for instructional interventions in math.

The recommendations, which reflect "the best evidence on effective practices in mathematics interventions," are presented along with their corresponding level of evidence in the following figure.⁴⁶³ The definitions for WWC's levels of evidence are provided in the appendix on pages 110 to 112.

⁴⁶² Figure content quoted verbatim with modification from: Ibid., pp. 1–11.

⁴⁶³ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 6.

IES Recommended Math Intervention Strategies

| RECOMMENDATION | LEVEL OF EVIDENCE |
|--|-------------------|
| Tier 1 | |
| Screen all students to identify those at risk for potential mathematics difficulties and provide interventions to students identified as at risk. | Moderate |
| Tier 2 and Tier 3 | |
| Instruction during the intervention should be explicit and systematic. This includes providing models of proficient problem solving, verbalization of thought processes, guided practice, corrective feedback, and frequent cumulative review. | Strong |
| Interventions should include instruction on solving word problems that is based on common underlying structures. | Strong |
| Intervention materials should include opportunities for students to work with visual representations of mathematical ideas and interventionists should be proficient in the use of visual representations of mathematical ideas. | Moderate |
| Interventions at all grade levels should devote about 10 minutes in each session to building fluent retrieval of basic arithmetic facts. | Moderate |
| Instructional materials for students receiving interventions should focus intensely on in-depth treatment of whole numbers in kindergarten through grade 5 and on rational numbers in Grades 4 through 8. These materials should be selected by the committee. | Low |
| Monitor the progress of students receiving supplemental instruction and other students who are at risk. | Low |
| Include motivational strategies in Tier 2 and Tier 3 interventions. | Low |

Source: Institute of Education Sciences, U.S. Department of Education⁴⁶⁴

The following pages synthesize the strategies from the IES report and recommendations, a similar report produced in 2016 by the American Institutes for Research's National Center on Intensive Intervention (NCII), and additional literature on increasing the math achievement of struggling students.

EXPLICIT DIRECT INSTRUCTION

Research consistently finds that *explicit and systematic instruction* is highly effective for students struggling with math, and "provide[s] in-depth coverage of the most critical content areas of mathematics and reflect[s] current research on effective mathematics instruction."⁴⁶⁵ According to the National Mathematics Advisory Panel's (NMAP) 2008 final report, explicit instruction aids in solving word problems, computation, and transferring known skills to novel situations – particularly for students with learning disabilities and low-achieving students.⁴⁶⁶

Explicit, systematic math instruction requires clearly teaching the steps involved in solving or understanding a problem or using a strategy.⁴⁶⁷ Instruction can be direct and explicit regardless of the topic and can take many forms. The NMAP defines explicit instruction as including the following requirements:⁴⁶⁸

- Teachers provide clear models for solving a problem type using an array of examples

⁴⁶⁴ Figure content quoted verbatim with modification from: Ibid.

⁴⁶⁵ Doabler, C.T. et al. "Enhancing Core Mathematics Instruction for Students at Risk for Mathematics Disabilities." *Teaching Exceptional Children*, 44:4, April 2012. p. 48. Accessed via ProQuest.

⁴⁶⁶ Faulkner, L. et al. "The Final Report of the National Mathematics Advisory Panel." U.S. Department of Education, 2008. p. 48. <https://www2.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf>

⁴⁶⁷ [1] "Principles for Designing Intervention in Mathematics." National Center on Intensive Intervention, 2016. pp. 3–4. http://www.intensiveintervention.org/sites/default/files/Princip_Effect_Math_508.pdf

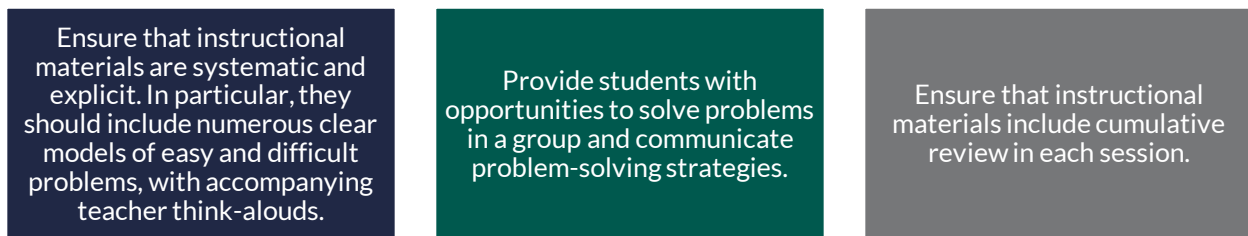
[2] Vaughn et al., Op. cit., p. 17.

⁴⁶⁸ Bullet points quoted verbatim from: Faulkner et al., Op. cit., p. xxiii.

- Students receive extensive practice in use of newly learned strategies and skills
- Students are provided with opportunities to think aloud (i.e., talk through the decisions they make and the steps they take)
- Students are provided with extensive feedback

Following the NMAP’s findings, a guide published by the IES finds strong evidence for the effectiveness of explicit and systematic mathematics instruction and includes the practice as a key recommendation for teaching students struggling with math. The following figure includes recommendations from the IES regarding systematic math instruction, focusing on instructional materials, class structure, and review.⁴⁶⁹

Components of Explicit Systematic Instruction



Source: Institute of Education Sciences, U.S. Department of Education⁴⁷⁰

Explicit instruction requires the instructor to clearly model how to apply a skill or solve a problem, offer step-by-step instruction, and provide students with time to practice.⁴⁷¹ When modeling the steps to solve a problem, the IES recommends that teachers “think aloud” and share their thinking processes. Explaining the reasoning behind each step helps students to understand the underlying mathematics. To provide instruction that is also systematic, instructors “**should gradually build proficiency by introducing concepts in a logical order and by providing students with numerous applications of each concept.**”⁴⁷² Additionally, each lesson should include cumulative review, which helps students practice previously taught concepts, remember what they learned, and make connections between math concepts. For example, when practicing fractions, students could also practice other their multiplication and division skills.⁴⁷³ These steps, as well as further essential components of explicit and systematic instruction, are presented in the figure below.

⁴⁶⁹ Bullet points quoted verbatim from: Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., pp. 21–24.

⁴⁷⁰ Figure content quoted verbatim from: Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 11.

⁴⁷¹ “Principles for Designing Intervention in Mathematics,” Op. cit., pp. 3–4.

⁴⁷² Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., pp. 21–24.

⁴⁷³ Ibid.

Components of Explicit and Systematic Instruction

Advance Organizer

- Providing students with an advance organizer allows them to know the specific objective of the lesson and its relevance to everyday life.

Assessing Background Knowledge

- Instructors determine whether students have mastered the prerequisite skills for successful problem solving in the new concept area. Instructors can also determine whether students are able to generalize previously learned concepts to the new concept.

Modeling

- Instructors “think aloud” as they model the process of working through a computation problem; read, set up, and solve a word problem; use a strategy; or demonstrate a concept. Instructors should be clear and direct in their presentation; and precise and mindful in using general and mathematical vocabulary and in selecting numbers or examples for use during instruction.

Guided Practice

- Instructors engage all students by asking questions to guide learning and understanding as students actively participate in solving problems. Instructors prompt and scaffold student learning as necessary. Positive and corrective feedback is provided during this phase, and instruction is adjusted to match student needs.

Independent Practice

- After achieving a high level of mastery, students move to the independent practice phase where they autonomously demonstrate their new knowledge and skills. During independent practice, the instructor closely monitors students and provides immediate feedback as necessary. If students demonstrate difficulty at this stage, instructors evaluate and adjust their instruction to re-teach concepts as needed.

Maintenance

- Instructors use distributed practice to assess student maintenance at regularly scheduled intervals. Distributed practice is focused practice on a specific skill, strategy, or concept. The frequency of these practice assessments is determined by the difficulty level of the skill and according to individual student needs. Maintenance may also include cumulative practice.

Source: National Center on Intensive Intervention⁴⁷⁴

Multiple meta-analyses of studies conducted in the past twenty years indicate that explicit direct instruction is effective for the general student body, students struggling to learn math, and students with demonstrated math difficulties. For example, a 2009 meta-analysis by Gersten et al. in *Review of Educational Research* analyzed 11 studies of math interventions for low-achieving students and found that explicit instruction had an overall significant mean effect size of 1.22 on student math achievement.⁴⁷⁵ Additionally,

⁴⁷⁴ Figure content quoted verbatim with modification from: “Principles for Designing Intervention in Mathematics,” Op. cit., pp. 3–4.

⁴⁷⁵ Gersten, R. et al. “Mathematics Instruction for Students with Learning Disabilities: A Meta-Analysis of Instructional Components.” *Review of Educational Research*, 79:3, 2009. p. 1216.

https://www.researchgate.net/profile/Russell_Gersten/publication/258182785_Mathematics_Instruction_for_Students_With_Learning_Disabilities_A_Meta-Analysis_of_Instructional_Components/links/00b49537d097c25025000000.pdf

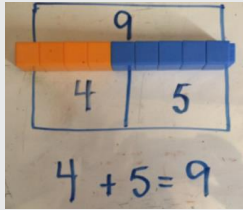

in a meta-analysis in *Remedial and Special Education*, researchers analyzed 58 studies of math interventions for elementary students with special needs, focusing on interventions dealing with preparatory math, basic skills, and problem-solving strategies. Interventions that provided direct instruction had a mean effect size of 1.13.⁴⁷⁶

VISUAL REPRESENTATIONS

Math instruction that uses concrete manipulatives and visual representations can help students who struggle with math, with a mean effect size of 0.47 as measured through a 2008 meta-analysis.⁴⁷⁷ Students often struggle to grasp the abstract, conceptual nature of math, and thus providing students with concrete or visual examples facilitates connections and a deeper understanding.⁴⁷⁸ The Center on Instruction (COI) recommends teaching students to visually represent information when solving a math problem, arguing that the systematic use of visuals positively affects the math outcomes of struggling students and students with disabilities by clarifying and simplifying problems.⁴⁷⁹ The most common types of visual aides are drawings, number lines, diagrams, and graphs, while concrete manipulatives can include tiles, counting bears, money, and blocks.⁴⁸⁰

The NCII notes that systematically progressing from concrete and visual representations of math problems to abstract and symbolic representations allows students to better understand math conceptually.⁴⁸¹ The following figure describes the three stages of representing math concretely with physical manipulatives, visually with drawings, diagrams, or graphs, and abstractly with numbers and symbols. **Notably, teaching math through these stages can be effective for students struggling with more complex math skills as well as foundational skills.**

Math Representation Stages

| STAGE | DESCRIPTION | EXAMPLE |
|----------|--|---|
| Concrete | Students use three-dimensional manipulatives to solve problems and to gain a better conceptual understanding of a concept. |  |
| Visual | Students use two-dimensional pictures, drawings, or diagrams to solve problems. These pictures, drawings, or diagrams may be given to the students, or they may draw them when presented with a problem. These representations should be used to connect and solve the same concepts previously taught using concrete objects. |  |

⁴⁷⁶ Kroesbergen, E.H. and J.E.H. van Luit. "Mathematics Interventions for Children with Special Educational Needs: A Meta-Analysis." *Remedial & Special Education*, 24:2, April 3, 2003. pp. 109–111. Accessed via EbscoHost.

⁴⁷⁷ Jayanthi, M., R. Gersten, and S. Baker. "Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics." Center on Instruction, 2008. p. 8.
<http://www.centeroninstruction.org/files/Mathematics%20Instruction%20LD%20Guide%20for%20Teachers.pdf>

⁴⁷⁸ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., pp. 30–33.

⁴⁷⁹ Jayanthi, Gersten, and Baker. Op. cit. p. 8.

⁴⁸⁰ [1] "Principles for Designing Intervention in Mathematics," Op. cit. p. 5.

[2] Barnett, J.E.H. and S. Cleary. "Review of Evidence-Based Mathematics Interventions for Students with Autism Spectrum Disorders." *Education and Training in Autism and Developmental Disabilities*, 50:2, June 2015. p. 174. Accessed via ProQuest.

⁴⁸¹ "Principles for Designing Intervention in Mathematics," Op. cit., p. 5.

| STAGE | DESCRIPTION | EXAMPLE |
|-------------------------------|--|-------------|
| Abstract/ Symbolic | Students solve problems with numbers and symbols rather than concrete objects or visual representations. Students are often expected to memorize facts and algorithms as well as to build fluency. | $4 + 5 = 9$ |

Source: National Center on Intensive Intervention⁴⁸²

However, the **IES cautions against an overemphasis on manipulatives**, noting the importance of “fading them away systematically to reach the abstract level.” Using manipulatives becomes counterproductive when students over-rely on the manipulatives and do not learn math at the abstract level. **To avoid an overreliance on manipulatives, the instructor or interventionist should use manipulatives during the initial instruction of a new strategy and then scaffold instruction so students reach the abstract stage.**⁴⁸³

Furthermore, while visuals can be helpful, they should be used alongside explicit instruction. Also, empirical studies find that visual aids are more effective when used by *both* the teacher and the student, and that the most effective visuals address a specific problem type.⁴⁸⁴ The IES recommends using visual representations “extensively and consistently” and suggests interventionists “explicitly link visual representations with the standard symbolic representations used in mathematics.”⁴⁸⁵

WORD PROBLEMS

Students should learn to categorize the structures of word problem types and strategies for solving different problem types.⁴⁸⁶ The IES, which rates the evidence supporting word problem instruction as “strong” based on empirical review, recommends explicitly teaching students about the underlying structures of word problems with similar mathematical structures. Teachers should also help students to identify the relevant elements of the problem, such as numbers and vocabulary, and distinguish them from superficial elements of the problem, such as the problem’s format (e.g., a story or advertisement). Once students are familiar with the underlying structure of word problem types and can identify relevant features, students can apply their knowledge of how to solve underlying structures of familiar problems to new, unfamiliar problems.

Students struggling with word problems can benefit from mnemonic devices. The Council for Learning Disabilities (CLD) provides four strategies for students with math difficulties: “R.I.D.E.,” “F.A.S.T D.R.A.W.,” “T.I.N.S.,” and “S.T.A.R.”⁴⁸⁷ The figure below describes the four strategies and their meanings.

⁴⁸² Figure content quoted verbatim with modification from: Ibid.

⁴⁸³ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 36.

⁴⁸⁴ Jayanthi, Gersten, and Baker, “Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics,” Op. cit., p. 8.

⁴⁸⁵ Gersten, Beckmann, et al., Op. cit., p. 31.

⁴⁸⁶ Ibid., pp. 26–29.

⁴⁸⁷ Hott, B., L. Isbell, and T. Montani. “Strategies and Interventions to Support Students with Mathematics Disabilities.” Center for Learning Disabilities, 2014. p. 2. http://www.council-for-learning-disabilities.org/wp-content/uploads/2014/12/Math_Disabilities_Support.pdf

Mnemonic Strategies for Solving Word Problems

| R.I.D.E. | F.A.S.T.D.R.A.W. | T.I.N.S. | S.T.A.R. |
|---|--|---|---|
| <ul style="list-style-type: none"> •R—Remember the problem correctly. •I—Identify the relevant information. •D—Determine the operations and unit for expressing the answer. •E—Enter the correct numbers, calculate and check the answer. | <ul style="list-style-type: none"> •F—Find what you're solving for. •A—Ask yourself, "What are the parts of the problem?" •S—Set up the numbers. •T—Tie down the sign. •D—Discover the sign. •R—Read the problem. •A—Answer, or draw and check. •W—Write the answer. | <ul style="list-style-type: none"> •T—Thought. Think about what you need to do to solve this problem and circle key words. •I—Information. Circle and write the information to solve this problem; draw a picture; cross out unneeded information. •N—Number sentence. Write a number sentence to represent the problem. •S—Solution Sentence. Write a solution sentence that explains your answer. | <ul style="list-style-type: none"> •S—Search the word problem. •T—Translate the words into an equation in picture form. •A—Answer the problem. •R—Review the problem. |

Source: Council for Learning Disabilities⁴⁸⁸

The CLD recommends that *visually displaying* one or more of these strategies in the classroom and demonstrating how to perform each step can help students struggling with word problems. The first strategy, RIDE, can be especially helpful for students who struggle with abstract reasoning, attention, memory, and visual-spatial skills.⁴⁸⁹

BUILDING FLUENCY

Students who struggle with math benefit from increasing their fluency in fact retrieval and procedural knowledge. The IES emphasizes that a “weak ability to retrieve arithmetic facts is likely to impede understanding of concepts students encounter with rational numbers, since teachers and texts often assume automatic retrieval of facts.”⁴⁹⁰ Fluency in retrieving arithmetic facts allows students to work on more complicated, multi-step math problems.⁴⁹¹ Fluency can also increase students’ confidence and motivation to complete challenging mathematics tasks.⁴⁹²

Students can build fluency through strategies and practice that emphasize automatic retrieval of arithmetic facts. The IES recommends spending 10 minutes per session for building automatic retrieval of arithmetic facts, while the NCII recommends combining timed activities with additional opportunities for practice.⁴⁹³ The IES states that “the goal is quick retrieval of facts using the digits 0 to 9 without any access to pencil and paper or manipulatives... Presenting facts in number families (such as $7 \times 8 = 56$, $8 \times 7 = 56$, $56/7 = 8$, and $56/8 = 7$) shows promise for improving student fluency.” Students in Grades K-2 should practice counting, while students in Grades 2-8 should practice using their knowledge of properties (e.g., commutative, associative, and distributive) to retrieve facts and solve problems in their heads.⁴⁹⁴

⁴⁸⁸ Figure content quoted verbatim with modification from: Ibid., pp. 2–4.

⁴⁸⁹ Ibid., p. 2.

⁴⁹⁰ Gersten, Beckmann, et al., Op. cit., p. 37.

⁴⁹¹ Ibid.

⁴⁹² “Principles for Designing Intervention in Mathematics,” Op. cit., p. 14.

⁴⁹³ [1] Gersten, Beckmann, et al., Op. cit., pp. 37–39.

[2] “Principles for Designing Intervention in Mathematics,” Op. cit., p. 14.

⁴⁹⁴ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., pp. 37–40.

Common methods for building automatic retrieval include the use of timed activities, technology and computer software, flash cards, and instructional games.⁴⁹⁵ The figure below highlights five instructional games recommended by the NCII for promoting fluency in retrieving arithmetic facts.

Instructional Games for Building Fluency

- **Bingo:** The instructor draws a card and reads the number, basic facts, fraction, or other item. Students mark the number or solution on their bingo cards. The first student who completes a row or column wins only if he or she can read all the numbers or answer all the problems in the row or column.
- **Concentration/Memory:** Students play the game as they would with cards; however, before students can pick up a match, they must read the numbers or solve the problem.
- **Dominoes:** Students play the game as they would regular dominoes by matching numbers with objects, math facts, fraction names with pictures of fractions, and so forth. Students must be able to answer the problem before they place their dominoes.
- **Board games:** Using commercially produced board games can assist students in counting, estimation, and understanding real-world applications of money. Board games also tend to be linear and link to understanding of measurement and fractions in later grades.
- **I have ____; who has ____?** This game can be used to practice a variety of mathematical skills. The sentence structure "I have ____; who has ____?" is written on each card. The cards are evenly distributed among students. One card has the word Start written on it. Examples are as follows: "I have 5; who has 6 more?" "I have 11; who has 2 less?" "I have 9; who has its double?" "I have 18; who has 7 less?" The game continues until all cards have been used. This game can be used to practice knowledge of basic facts or more advanced skills such as adding and subtracting fractions with unlike denominators.

Source: National Center on Intensive Intervention⁴⁹⁶

RESPONSE TO INTERVENTION

This section examines the delivery of math interventions within the Response to Intervention (RTI) model, including an overview of RTI, characteristics of effective assessments, and models for delivering the intervention strategies described in Section I.

RTI OVERVIEW

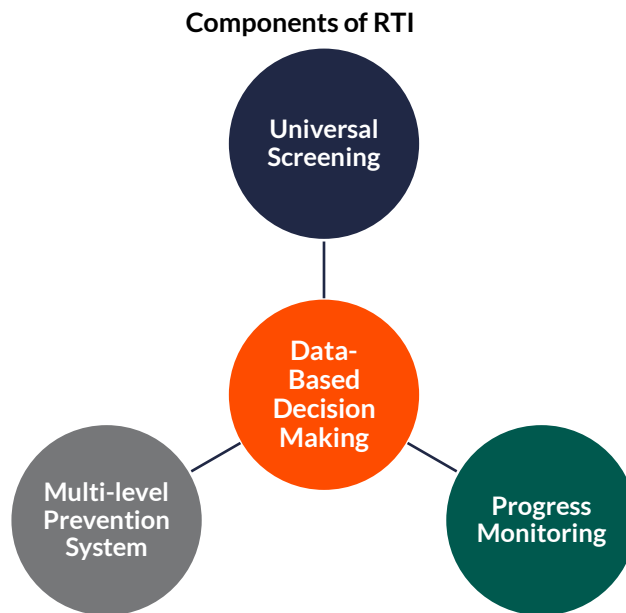
Response to Intervention (RTI) is a schoolwide, multi-level prevention system that uses assessment and intervention to increase student achievement.⁴⁹⁷ RTI has four main components, as described in the following figure.

⁴⁹⁵ [1] Ibid.

[2] "Principles for Designing Intervention in Mathematics," Op. cit., p. 14.

⁴⁹⁶ Figure content quoted verbatim with modification from: "Principles for Designing Intervention in Mathematics," Op. cit., p. 15.

⁴⁹⁷ "Essential Components of RTI – A Closer Look at Response to Intervention." National Center on Response to Intervention, April 2010. p. 2. http://www.rti4success.org/sites/default/files/rtiessentialcomponents_042710.pdf



Source: Center on Response to Intervention⁴⁹⁸

The foundation of RTI involves data-based decision making; teachers and school staff regularly screen students and monitor their progress in order to provide instruction and intervention that meets students' needs.⁴⁹⁹ Universal screening, which briefly assesses all students in a grade, identifies students that are at risk for low achievement.⁵⁰⁰

Progress monitoring assesses students' academic performance and the effectiveness of instruction and intervention.⁵⁰¹ RTI follows a multi-level prevention system consisting of three tiers of intervention:⁵⁰²

- **Tier 1** involves high-quality instruction for all students.
- **Tier 2** involves evidence-based intervention for students not making progress with regular instruction.
- **Tier 3** involves individualized, intense intervention for students who do not respond to Tier 2 interventions.

ASSESSMENT

Assessing students' math abilities is both a formal and informal process and involves universal screening and continuous progress monitoring. Research points to the importance of studying a student's growth longitudinally, as opposed to just a single point in time.⁵⁰³

⁴⁹⁸ Ibid.

⁴⁹⁹ "Data-Based Decision Making." Center on Response to Intervention. <http://www.rti4success.org/essential-components-rti/data-based-decision-making>

⁵⁰⁰ "Universal Screening." Center on Response to Intervention. <http://www.rti4success.org/essential-components-rti/universal-screening>

⁵⁰¹ "Progress Monitoring." Center on Response to Intervention. <http://www.rti4success.org/essential-components-rti/progress-monitoring>

⁵⁰² "Multi-Level Prevention System." Center on Response to Intervention. <http://www.rti4success.org/essential-components-rti/multi-level-prevention-system>

⁵⁰³ Gersten, R., N.C. Jordan, and J.R. Flojo. "Early Identification and Interventions for Students with Mathematics Difficulties." *Journal of Learning Disabilities*, 38:4, 2005. p. 294. <https://pdfs.semanticscholar.org/8e53/94e7ef08242b5b2050149d56a16904294553.pdf>

TYPES OF ASSESSMENT USED IN RTI

UNIVERSAL SCREENING

Universal screening, an essential component of the RTI framework, assesses *all* students to identify those at risk for math difficulties and in need of additional intervention. The RTI Action Network, a program of the National Center for Learning Disabilities (NCLD), writes that universal screening “is the mechanism for targeting students who struggle to learn when provided a scientific, evidence-based general education.”⁵⁰⁴ Universal screening measures are typically brief, easily administered, and focus on key skills that are predictive of later math outcomes.⁵⁰⁵

Experts recommend that schools screen all students two to three times per year to ensure the identification of all struggling students.⁵⁰⁶ The Center on Response to Intervention (CRTI) and RTI Action Network recommend screening students in the fall, winter, and spring.⁵⁰⁷ In a report regarding RTI math interventions for elementary and middle school students, the National Association of Elementary School Principals (NAESP), which recommends screening at the beginning and the middle of the school year, asserts that twice-a-year screening “ensure[s] that those at risk are identified and receive intervention services in a timely fashion.”⁵⁰⁸ Similarly, the 2009 IES guide emphasizes that *multiple* screenings address concerns about students who fall just above or below cut scores on screening measures. In addition, subsequent screenings allow for growth comparisons; a second or third screening “serves to identify any students who may have been at risk and grown substantially in their mathematics achievement—or those who were on track at the beginning of the year but have not shown sufficient growth.”⁵⁰⁹

Districts should standardize screening tools and procedures used to enable objective comparisons between schools. Using the same screening tools allows the district to analyze results at the district level and implement instructional decisions and interventions for the entire district.⁵¹⁰ Additionally, universal screening relies on high-quality, reliable screening tools. The following figure provides a link to the NCII website, which reviews mathematics screening tools.

Mathematics Screening Tools Review Guide

Click the link below for reviews of mathematics screening tools from the NCII at American Institutes for Research, which are organized by accuracy, generalizability, and validity:

Screening Tools Review

Source: National Center on Intensive Intervention⁵¹¹

The IES also recommends using screening data in combination with state testing results for students in Grades 4-8. Districts can also use the previous year’s state testing results as a benchmark for initial screening, which “would allow districts and schools to combine a broader measure that covers more content with a screening measure that is narrower but more focused.”⁵¹²

⁵⁰⁴ Hughes, C. and D. Dexter. “Universal Screening Within a RTI Model.” RTI Action Network. <http://www.rtinetwork.org/learn/research/universal-screening-within-a-rti-model>

⁵⁰⁵ Ibid.

⁵⁰⁶ Lembke, E., D. Hampton, and S. Beyers. “Response to Intervention in Mathematics: Critical Elements.” *Psychology in the Schools*, 49:3, March 2012. p. 258. Accessed via EbscoHost.

⁵⁰⁷ [1] Hughes and Dexter, Op. cit.

[2] “What Is RTI?” Center on Response to Intervention, 2015. http://www.rti4success.org/sites/default/files/RTI_Placemat_2015.pdf

⁵⁰⁸ “Response to Intervention in Elementary-Middle Math.” National Association of Elementary School Principals, 2011. p. 3. http://www.naesp.org/sites/default/files/Math_Intervention_blue.pdf

⁵⁰⁹ Gersten, Beckmann, et al., Op. cit., p. 14.

⁵¹⁰ Ibid., p. 15.

⁵¹¹ “Academic Screening Tools Chart.” National Center on Intensive Intervention at American Institutes for Research. <http://www.rti4success.org/resources/tools-charts/screening-tools-chart>

⁵¹² Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 15.

PROGRESS MONITORING

Progress monitoring is critical to ensuring the effectiveness of math interventions, and experts recommend assessing students' progress regularly and continuously. Progress monitoring assessment tools are typically brief, and common intervals include weekly, biweekly, or monthly assessment.⁵¹³ Progress monitoring is crucial for students receiving Tier 2 and 3 interventions. However, schools should also monitor the progress of borderline Tier 1 students who scored just above the cutoff score and do not receive additional instruction so that they can be moved to Tier 2 if necessary.⁵¹⁴

Teachers and school staff use progress monitoring assessments to measure student progress, assess improvement and responsiveness to intervention strategies, and evaluate the effectiveness of the intervention. Progress monitoring also helps teachers and interventionists to create and adjust individualized education programs (IEP's).⁵¹⁵ For struggling students, teachers should continuously gather information and data to plan and adjust instruction, content, and pacing.⁵¹⁶ Educators should adjust the intervention according to progress monitoring data. If students are not responding to the intervention, teachers can increase the intensity or implement instructional changes.⁵¹⁷ Students who continuously meet benchmarks may qualify to be moved back to Tier 1.⁵¹⁸

Progress monitoring tools must accurately represent students' academic development and must be useful for instructional planning and assessing student learning.⁵¹⁹ Further, progress monitoring tools can assess *general outcome measures* and *curriculum embedded measures*.⁵²⁰ General outcomes measures offer a broad view of students' math proficiency, while curriculum embedded measurement assesses student growth and instructional effectiveness.⁵²¹

CHARACTERISTICS OF EFFECTIVE ASSESSMENT TOOLS FOR SCREENING AND PROGRESS MONITORING

There are several methods for screening and continuously monitoring elementary school students' math abilities, which vary in effectiveness and administrative time and ease.⁵²² When choosing a screening tool, the district should evaluate the tool's predictive validity and content selection.⁵²³ Researchers with the COI emphasize the importance of ensuring that a student's performance on the screening assessment predicts their future math performance in subsequent grades, as "assessments that show evidence of predictive validity can inform instructional decision-making."⁵²⁴ Similarly, the IES recommends that a team comprised of individuals with measurement expertise, such as evaluation and research staff, and individuals with math expertise, select the screening and other assessment tools based on the following criteria:⁵²⁵

- **Predictive Validity:** An index of how well a score on a screening measure earlier in the year predicts a student's later mathematics achievement. The IES panel recommends that districts employ measures with predictive validity coefficients of at least 0.60 within a school year

⁵¹³ "What Is RTI?," Op. cit.

⁵¹⁴ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 42.

⁵¹⁵ "Essential Components of RTI – A Closer Look at Response to Intervention," Op. cit., pp. 6–7.

⁵¹⁶ Lembke, Hampton, and Beyers, Op. cit., p. 259.

⁵¹⁷ "Essential Components of RTI – A Closer Look at Response to Intervention," Op. cit., p. 7.

⁵¹⁸ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 41.

⁵¹⁹ "Essential Components of RTI – A Closer Look at Response to Intervention," Op. cit., pp. 6–7.

⁵²⁰ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 41.

⁵²¹ [1] Ibid., p. 42.

[2] Lembke, Hampton, and Beyers, Op. cit., p. 263.

⁵²² Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 13.

⁵²³ Gersten, R., B.S. Clarke, K. Haymond, and N.C. Jordan. "Screening for Mathematics Difficulties in K-3 Students." Center on Instruction, 2011. p. 3. <http://www.centeroninstruction.org/files/Screening%20for%20Math%202nd%20Ed%202-3-12.pdf>

⁵²⁴ Ibid.

⁵²⁵ Bullet points quoted verbatim with modification from: Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 14.

- **Reliability:** An index of the consistency and precision of a measure. The IES panel recommends that districts use measures with reliability coefficients of .80 or higher
- **Efficiency:** How quickly the universal screening measure can be administered, scored, and analyzed for all the students. The IES panel recommends that measures take no more than 20 minutes to administer

Assessment instruments can either be single-proficiency or multiple-proficiency measures. Single proficiency screening measures assess “discrete aspects of numerical aptitude” and only assess individual early math skills. Districts can administer single proficiency measures quickly and easily, as they are more focused, can be administered in a few minutes, and can be administered to large groups of students for use across an entire school or district. Alternately, multiple proficiency screening measures assess several components of numerical proficiency and provide a composite total score rather than separate scores for separate skills.⁵²⁶ The IES notes that while the most predictive single measure approaches assess a student’s knowledge of magnitude comparison and strategic counting, some research indicates that multiple proficiency measures are better able to predict students’ future math performance.⁵²⁷

CONTENT

In addition to sound psychometric characteristics, effective math screening and progress monitoring assessments are based on critical math content and aligned with the grade-level math curriculum and standards.⁵²⁸ Screening tools should include assessments of both how a student performs relative to other students in a class or grade (relative judgments) and how a student performs relative to grade-level standards (absolute judgments). Screening tools that include only one judgment type may lead to errors in student referral and intervention decisions.⁵²⁹

The content for assessment tools should reflect the objectives for a student’s grade level and assess numerical proficiency in accordance with a student’s grade level. The IES recommends that screening tools in the lower elementary grades focus on students’ understanding of whole numbers, while screening tools in the upper elementary grades should focus on students’ understanding of rational numbers, as well as computational proficiency.⁵³⁰ Numerical proficiency (also known as number sense) is essential for all students, and includes skills such as recognizing numbers, counting, and comparing quantities.⁵³¹ The following figure presents the components of numerical proficiency. Notably, the IES finds that magnitude comparison and strategic counting are two of the most predictive screening measures.⁵³²

Components of Numerical Proficiency

| COMPONENT | DESCRIPTION | EXAMPLE |
|-----------------------------|---|--|
| Magnitude Comparison | The ability to identify and compare bigger and smaller numbers or amounts. Almost all screening tools use some measure of magnitude comparison. | Showing a picture of a worm and five birds to a student and asking if each bird can have a worm requires the student to make a “gross magnitude judgment.” |

⁵²⁶ Gersten, Clarke, Haymond, and Jordan, Op. cit., p. 9.

⁵²⁷ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 13.

⁵²⁸ Lembke, Hampton, and Beyers, Op. cit., p. 259.

⁵²⁹ VanDerHeyden, “RTI and Math Instruction,” Op. cit.

⁵³⁰ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 15.

⁵³¹ Gersten, Clarke, Haymond, and Jordan, Op. cit., p. 5.

⁵³² Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 13.

| COMPONENT | DESCRIPTION | EXAMPLE |
|--|---|---|
| Strategic Counting | Includes: <ul style="list-style-type: none"> Knowledge of basic counting principles: understanding that changing the order of counting does not affect the quantity but additional and subtraction do; and Counting skills such as correctly using manipulatives (like fingers or objects) to count to a certain number. | When given a group of 5 objects and a group of 3 objects, students can “count on” from 5 (i.e., count 6, 7, 8) to determine the total quantity. |
| Retrieval of Basic Arithmetic Facts | The ability to retrieve basic addition and subtraction number combinations without using manipulatives (e.g. counting on one’s fingers). Problems with this ability are common among students with math difficulties or math-related learning disabilities and indicate a problem with semantic memory (i.e. the ability to store and retrieve abstract information). | Mental retrieval of addition/subtraction combinations without using tools. |
| Word Problems | Math problems that refer to objects and provide context, rather than number combinations. | Using a story to present an addition problem instead of a numerical equation. |
| Numeral Recognition | The ability to understand the naming system used for numbers and math functions. This ability “serves as a gateway skill to formal mathematics. | Recognizing the name “nine” applies to the symbol “9.” |

Source: Center on Instruction⁵³³

INTERVENTION IMPLEMENTATION AND DELIVERY

The math intervention strategies described in Section I should be implemented to varying degrees depending on a student’s needs and tier level – with differences in intensity, frequency, and duration. Regardless of the delivery method, effective intervention should follow the instructional practices detailed in Section I, with students assigned to different tiers of intervention intensity depending on their needs.

IMPLEMENTATION CONSIDERATIONS

When implementing RTI for math, districts and schools can use an implementation checklist to ensure that math interventions are being implemented effectively and with fidelity. One such checklist—shown in the following figure—describes the essential elements of effective math intervention within the RTI framework, the date by which each element should be completed, who is responsible for implementing each element, what activities will support implementing each element, and an implementation goal for each element. As teachers become more effective at implementing math interventions and student data is tracked, goals should be adjusted.

RTI Implementation Checklist

| CRITICAL ELEMENT | DATE | WHO IS RESPONSIBLE ? | ACTIVITY | GOAL |
|--|------|----------------------|----------|------|
| Mathematics screening system that provides reliable and valid data is chosen and implemented at least three times per year. | | | | |

⁵³³ Figure contents quoted verbatim with modification from: Gersten, Clarke, Haymond, and Jordan, Op. cit., pp. 5–8.

| CRITICAL ELEMENT | DATE | WHO IS RESPONSIBLE ? | ACTIVITY | GOAL |
|--|------|----------------------|----------|------|
| Mathematics progress monitoring system that provides frequent, reliable, and valid data on student progress is chosen and implemented. | | | | |
| Schoolwide screening data in mathematics are examined and discussed by teams following screening to evaluate current core programs. | | | | |
| An evidence-based core instructional program in mathematics is implemented with fidelity. | | | | |
| Evidence-based mathematics interventions for Tiers 2 and 3 are identified, scheduled, and implemented with fidelity. | | | | |
| A routine for progress monitoring of students in Tiers 2 and 3 in mathematics is established and data are discussed routinely using data decision rules. | | | | |
| Fidelity checks on core mathematics instruction, mathematics enrichment for Tier 1 students, and mathematics intervention for Tier 2 and Tier 3 students are scheduled, completed, and discussed on a frequent basis. | | | | |

Source: Lembke, Hampton, and Beyers⁵³⁴

MODELS FOR INTERVENTION DELIVERY

While instructional practices should be consistent, frameworks and models for intervention can vary, reflecting the different ways that schools and districts strategize to increase the intensity or frequency of math instruction. Methods for delivering math interventions and increasing the intensity of the intervention according to a students' needs include:⁵³⁵

- Adjusting the level of instruction
- Lengthening instructional time
- Reducing the size of the instructional group and increasing the amount of individualization
- Increasing the frequency of instructional sessions
- Providing instruction and support from a more experienced or specialized teacher (e.g., a reading specialist or a special educator)

In the following sections, we discuss these different strategies in turn.

INCREASING LEARNING TIME

Increasing the amount of time spent teaching and learning math – one of the most common methods for delivering math interventions to struggling students – can effectively improve students' math achievement. Districts can increase instructional time by increasing the frequency of the intervention, the

⁵³⁴ Figure contents quoted verbatim with modification from: Lembke, Hampton, and Beyers, Op. cit., p. 270.

⁵³⁵ Bullet points quoted verbatim with modification from: "Essential Components of RTI – A Closer Look at Response to Intervention," Op. cit., p. 7.

length of instructional sessions, or the duration of the intervention.⁵³⁶ For example, a school can increase the frequency of an intervention by providing additional instruction five days per week rather than three days per week. Increasing the length of intervention sessions, such as from 20 minutes to 40 minutes, also intensifies the intervention. However, teachers should monitor student engagement, which can decrease as the length of the session increases, especially for younger students.

For example, with students in Grades K-1, the COI notes that shorter intervention sessions that occur several times a day can more effectively address young students' interest and attention span.⁵³⁷ In addition to increasing the length or frequency of the intervention, teachers can also increase an intervention's intensity by increasing the duration. While some students may only require additional instruction for shorter time spans or specific content areas, some students benefit from interventions that continue over an extended period of time. For example, research shows that students in Grades K-2 benefit from interventions up to 20 weeks long, while older students who are multiple grades behind may need longer interventions.⁵³⁸

When designing the scope of an intervention, teachers should consider the frequency, length, and duration that best meet the student's needs. Variables such as a student's grade and age, the content, and the student's progress can affect the frequency, length, and duration. For example, student engagement should be considered. Other variables to consider when choosing the amount of instructional time include:⁵³⁹

- How far the student's achievement level is below grade-level expectations
- The length and frequency of the previous interventions
- The complexity of the learning tasks at hand

Furthermore, the COI emphasizes that increasing the intervention time should be used to accelerate learning and provide more instruction, not to provide the same amount of instruction over a longer time period.⁵⁴⁰ Whether instructional time is increased via increasing session frequency, length, or duration, teachers can use the additional time to:⁵⁴¹

- Teach additional skills and strategies
- Provide additional practice opportunities with feedback
- Deliver more explicit, systematic, (step-by-step) instruction
- Monitor student progress in the interventions to ensure that the additional learning time increases student mastery of skills

While research shows that increasing instructional time can improve student achievement, the majority of research has focused on reading rather than math.⁵⁴² One of a small number of math intervention studies, published in the *Elementary School Journal*, used data from the Early Childhood Longitudinal Study-Kindergarten Cohort to determine that an increase in the amount of time spent on math instruction is positively and significantly associated with an increase in student math achievement. While differences between groups and the effect size were small, the researchers note that an increase in instructional time was beneficial for all students, regardless of their initial achievement levels. **Notably, the researchers found that student engagement had a greater effect on achievement than instructional time.**⁵⁴³

⁵³⁶ Vaughn et al., Op. cit., p. 22.

⁵³⁷ Ibid.

⁵³⁸ Ibid., p. 23.

⁵³⁹ Bullet points quoted verbatim with modification from: Ibid., p. 25.

⁵⁴⁰ Ibid., p. 26.

⁵⁴¹ Bullet points quoted verbatim with modification from: Ibid.

⁵⁴² Ibid., p. 22.

⁵⁴³ Bodovski, K. and G. Farkas. "Mathematics Growth in Early Elementary School: The Roles of Beginning Knowledge, Student Engagement, and Instruction." *Elementary School Journal*, 108:2, November 2007. p. 126. Accessed via EbscoHost.

REDUCING INSTRUCTIONAL GROUP SIZE

Many math interventions rely on reducing the size of the instructional group, which increases the amount of individualized instruction a student receives. Instruction can occur in small groups of a few students or one-on-one. Often, as the intervention is intensified, instruction becomes more individualized. The COI cites research that **students receiving instruction in small groups of three to four students make more gains than students in large groups of eight to ten students**, noting that “small groups of two to four students or one-on-one instruction may provide the most intensive intervention and that some students make sufficient progress in larger groups.”⁵⁴⁴

In addition to small group instruction, research shows that one-on-one tutoring is also effective for assisting students struggling with math. For example, in an article published in the *Journal of Educational Psychology*, researchers conducted an experimental study of the effects of number combination tutoring and word problem tutoring on Grade 3 students with math difficulties, within two urban school districts. Tutoring sessions occurred for 20-30 minutes, three times per week for 16 weeks.⁵⁴⁵ The researchers found that tutored students outperformed control group students who were not tutored, with effect sizes of 0.55 for number combination tutoring and 0.62 for word problem tutoring.⁵⁴⁶

PEER-ASSISTED LEARNING AND TUTORING

Peer tutoring and peer-assisted learning, where students work in pairs and alternate the roles of tutor and tutee, can help students struggling with learning math. In a study published in the *Elementary School Journal*, researchers conducted a meta-analysis of 15 studies of math interventions for students with low math achievement. The researchers found that peer-assisted learning was effective at improving students’ math capabilities, especially in computation. Across six studies that implemented peer-assisted learning, the average effect size was 0.62, which is considered moderately strong and represents a nearly two-thirds of a standard deviation improvement for the experimental group compared with the control group.⁵⁴⁷

Similarly, the Best Evidence Encyclopedia (BEE), a web-based resource funded by the U.S. Department of Education that reviews and rates research on educational interventions, reviewed 87 studies and found **strong evidence supporting the effectiveness of peer-assisted learning strategies and class-wide peer tutoring**, two programs where students work in pairs.⁵⁴⁸ However, the COI notes that cross-age peer-assisted instruction, where a student in a higher grade tutors a student in a lower grade, can be more effective than within-class tutoring. Students who are very far behind and students with learning disabilities may need additional support than they can receive from a peer in their same grade. The COI analyzed two studies of cross-age peer tutoring and found a mean effect size of 1.02.⁵⁴⁹

INTERVENTION DELIVERY BY RTI TIER

TIER 1

Tier 1 requires delivering a high-quality curriculum to all students as a whole class.⁵⁵⁰ While strategies such as explicit instruction and visuals are delivered to the whole class, implementation often includes

⁵⁴⁴ Vaughn et al., Op. cit., p. 28.

⁵⁴⁵ Fuchs, L.S. et al. “Remediating Number Combination and Word Problem Deficits Among Students with Mathematics Difficulties: A Randomized Control Trial.” *Journal of Educational Psychology*, 101:3, August 1, 2009. pp. 8, 10.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2768320/>

⁵⁴⁶ Ibid., p. 15.

⁵⁴⁷ Baker, S., R. Gersten, and D. Lee. “A Synopsis of a Synthesis of Empirical Research on Teaching Mathematics to Low-Achieving Students.” *The Elementary School Journal*, 103, 2002. p. 2. <http://www.centeroninstruction.org/files/COI%20SPED%20synopsis.pdf>

⁵⁴⁸ “Elementary Mathematics: Top-Rated Programs.” Best Evidence Encyclopedia. <http://www.bestevidence.org/math/elem/top.htm>

⁵⁴⁹ Jayanthi, Gersten, and Baker, “Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics,” Op. cit., p. 11.

⁵⁵⁰ Lembke, Hampton, and Beyers, Op. cit., p. 266.

differentiating instruction through flexible grouping and peer tutoring.⁵⁵¹ Experts recommend that teachers ensure they are implementing the curriculum with fidelity by conducting self-checks. Teachers should check that they:⁵⁵²

- Provide an objective for the lesson in concrete and measurable terms
- Provide students a rationale for the strategy that you will be teaching them. Introduce the strategy through modeling
- Use the strategy with the students with several problems (guided practice)
- Have the students repeat back the steps in the strategy
- Have students work independently or in pairs to implement the strategy as they work on some problems together
- Teach for generalization
- Teach for maintenance

Tiers 2 and 3 involve interventions delivered with increased levels of intensity and individualization.

TIER 2

Students who struggle with general instruction are provided intervention strategies in Tier 2. Tier 2 intervention is delivered in small groups of students, where instruction can be further differentiated. Students may receive additional instruction using the strategies in Section I for 20- to 40-minute sessions four to five times per week for 10 to 15 weeks.⁵⁵³ Essential to the implementation of Tier 2 intervention is **frequent progress monitoring** to determine whether students are responding to the intervention and whether it needs to be increased or adjusted.⁵⁵⁴ The NCRTI notes that Tier 2 interventions should be teacher-led, occur in small groups, follow validated intervention strategies, and be implemented with fidelity.⁵⁵⁵

TIER 3

Students who do not benefit from the secondary intervention level receive more intensive, individual instruction in Tier 3. In an article on intensive math interventions for elementary students published in *Learning Disabilities Research & Practice*, researchers note that in Tier 3, “mathematics content and pedagogy are substantially different from that delivered at Tiers 1 and 2.”⁵⁵⁶ Interventions in Tier 3 provide the instructional strategies described in Section I one-on-one so that instruction is fully individualized and responsive to the student, thus frequent progress monitoring is crucial.⁵⁵⁷ The researchers recommend using the Tier 2 program as a platform for developing a Tier 3 intervention, where teachers modify a standard intervention according to progress monitoring data to create fully individualized, intensive instruction.⁵⁵⁸ A key strategy here is that teachers and interventionists approach intervention as a problem-solving activity, “modif[ying] components of the intervention program and continues to employ frequent progress monitoring to evaluate which components enhance the rate of student learning.”⁵⁵⁹

⁵⁵¹ Ibid.

⁵⁵² Bullet points quoted verbatim with modification from: Ibid.

⁵⁵³ Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 5.

⁵⁵⁴ Lembke, Hampton, and Beyers, Op. cit., p. 267.

⁵⁵⁵ “Essential Components of RTI – A Closer Look at Response to Intervention,” Op. cit., p. 10.

⁵⁵⁶ Powell, S. and L. Fuchs. “Intensive Intervention in Mathematics.” *Learning Disabilities Research & Practice*, 30:4, November 2015. p. 182. Accessed via EbscoHost.

⁵⁵⁷ Ibid.

⁵⁵⁸ Ibid., p. 183.

⁵⁵⁹ “Essential Components of RTI – A Closer Look at Response to Intervention,” Op. cit., p. 11.

APPENDIX A

EFFECTIVE INSTRUCTIONAL PROGRAMS FOR PURCHASE

The What Works Clearinghouse (WWC) at the U.S. Department of Education regularly reviews research on commercially-developed mathematics intervention programs. Through this assessment process, the WWC identified *five* elementary math intervention programs for which research meeting the WWC’s strict research design standards find potentially positive effects on student math outcomes. These programs include the following programs, which appear in more detail below:⁵⁶⁰

- Odyssey Math
- Everyday Mathematics
- Accelerated Math
- DreamBox Learning
- Saxon Math

The WWC defines a potential positive effectiveness rating as “evidence that the intervention had a positive effect on outcomes with no overriding contrary evidence.”⁵⁶¹ The WWC similarly defines the magnitude of effects – the improvement index – as “an indicator of the size of the effect from using the intervention. It is the expected change in percentile rank for an average comparison group student if the student had received the intervention.”⁵⁶²

The WWC categorizes the amount of evidence available as small or medium to large depending on the number of studies that meet WWC evidence standards and the total sample size across the studies.⁵⁶³ Many more programs do not have an effectiveness rating due to a lack of studies that meet WWC standards.

⁵⁶⁰ “Mathematics.” What Works Clearinghouse. <https://ies.ed.gov/ncee/wwc/FWW/Results>

⁵⁶¹ “WWC Intervention Report: Odyssey Math.” What Works Clearinghouse, January 2017. p. 4.
https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_odyseymath_013117.pdf

⁵⁶² “Accelerated Math.” What Works Clearinghouse. <https://ies.ed.gov/ncee/wwc/Intervention/309>

⁵⁶³ “WWC Intervention Report: Accelerated Math.” What Works Clearinghouse, September 2010. p. 4.
https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_accelmath_091410.pdf

Math Intervention Programs Reviewed by WWC with Potentially Positive Results

| PROGRAM | PUBLISHER | DESCRIPTION | AVERAGE PERCENTILE GAIN (IMPROVEMENT INDEX) | EVIDENCE LEVEL |
|--|--|---|--|-----------------|
| Odyssey Math ⁵⁶⁴ | Compass Learning | A web-based math instruction program that supports differentiated and data-driven instruction. No longer explicitly available for purchase. | 12 | Medium to Large |
| Everyday Mathematics ⁵⁶⁵ | University of Chicago School Mathematics Project and McGraw-Hill Education | A math curriculum for students in Grades pre-K–6 that provides students with multiple opportunities to reinforce concepts and practice skills. Focuses on real-life problem solving, student communication of mathematical thinking, and appropriate use of technology. | 11 | Small |
| Accelerated Math ⁵⁶⁶ | Renaissance Learning | A software tool used to customize assignments and monitor progress in mathematics. Creates individualized assignments that align with state standards and national guidelines, scores student work, and generates formative feedback through reports for teachers and students. | 7 | Medium to Large |
| DreamBox Learning ⁵⁶⁷ | DreamBox Learning, Inc. | A supplemental online mathematics program for students in grades K–5 that provides adaptive, individualized instruction and focuses on number and operations, place value, and number sense. | 4 | Small |
| Saxon Math ⁵⁶⁸ | Houghton Mifflin Harcourt | A core curriculum for students in grades K– 12 that uses an incremental approach to instruction and assessment. New concepts are introduced gradually and integrated with previously introduced content so that concepts are developed, reviewed, and practiced over time rather than being taught during discrete periods of time, such as in chapters or units. | 3 | Medium to Large |

Source: What Works Clearinghouse⁵⁶⁹

⁵⁶⁴ Figure contents quoted verbatim from: “WWC Intervention Report: Odyssey Math,” Op. cit.

⁵⁶⁵ Figure contents quoted verbatim from: “WWC Intervention Report: Everyday Mathematics.” What Works Clearinghouse, November 2015.
https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_everydaymath_111015.pdf

⁵⁶⁶ Figure contents quoted verbatim from: “WWC Intervention Report: Accelerated Math,” Op. cit.

⁵⁶⁷ Figure contents quoted verbatim from: “WWC Intervention Report: Dreambox Learning.” What Works Clearinghouse, December 2013.
https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_dreambox_121013.pdf

⁵⁶⁸ Figure contents quoted verbatim from: “WWC Intervention Report: Saxon Math.” What Works Clearinghouse, May 2013.
https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_saxon_052913.pdf

⁵⁶⁹ “Mathematics,” Op. cit.

What Works Clearinghouse's Levels of Evidence Definitions

| LEVEL OF EVIDENCE | DEFINITION |
|-------------------|---|
| Strong | Refers to consistent and generalizable evidence that an intervention program causes better outcomes. |
| Moderate | Refers either to evidence from studies that allow strong causal conclusions but cannot be generalized with assurance to the population on which a recommendation is focused (perhaps because the findings have not been widely replicated)—or to evidence from studies that are generalizable but have more causal ambiguity than offered by experimental designs (such as statistical models of correlational data or group comparison designs for which the equivalence of the groups at pretest is uncertain). |
| Low | Refers to expert opinion based on reasonable extrapolations from research and theory on other topics and evidence from studies that do not meet the standards for moderate or strong evidence. |

Source: What Works Clearinghouse⁵⁷⁰

⁵⁷⁰ Figure contents quoted verbatim from: Gersten, Beckmann, Clarke, Foegen, and Marsh, Op. cit., p. 1.

REPORT II: TOOLKIT: REACHING ALL STUDENTS IN SECONDARY MATH

INTRODUCTION

When a single classroom has students with highly varied proficiency levels, instructional time is pulled between addressing each student's learning needs and teaching the grade-level standards. This toolkit is designed with resources and frameworks that provide teachers with a way to both meet their students' varying needs and comply with the curriculum during their original teaching block.

The Response to Intervention (RTI) model has become a popular model for supporting students in secondary schools around the country.⁵⁷¹ This is a tiered framework for schools and classrooms that addresses the challenges of having students with very different academic abilities. All students receive Tier 1 grade-level curriculum instruction, while students who are not successful or are at risk academically receive interventions at Tier 2 and Tier 3. Implementation requires flexibility, openness, and commitment in order to ensure that every student receives the instruction they need.⁵⁷²

Importantly, effective implementation of RTI also depends on the use of data. Teachers must know who needs intervention, who is successful with grade-level curriculum, and who has progressed during intervention and does not need it anymore. Using a data inquiry cycle, teachers purposefully utilize the results from testing that already takes place in schools. This toolkit provides resources and protocols for teachers to use in analyzing data and designing instruction in response to student understanding.⁵⁷³

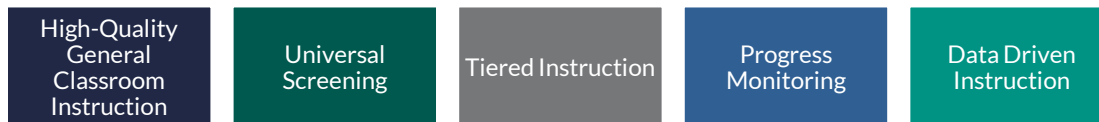
RTI and the data inquiry cycle are only successful if the selected interventions are effective.⁵⁷⁴ The final section of this toolkit provides recommendations for best practice math strategies for students who have difficulty in mathematics in general, as well as strategies specific to Algebra 1. Additionally, it provides a lesson planning framework that allows teachers to teach grade-level curriculum and provide intervention in a 45-minute instructional block.

USE THE RESPONSE TO INTERVENTION MODEL

UNDERSTAND THE FRAMEWORK

Response to Intervention (RTI) is a framework that addresses the learning needs of all students through tiered instruction.⁵⁷⁵ RTI originated as an elementary reading model to accurately identify students with learning disabilities versus struggling students who needed evidence-based interventions to perform at grade level. Since then, it has expanded to all grade levels and subject areas.⁵⁷⁶

Five Essential Components of RTI



Source: Center on Response to Intervention, American Institutes for Research⁵⁷⁷

⁵⁷¹ Ehren, B. "RTI in Secondary Schools: Is It on Your Radar Screen?" RTI Action Network. <http://www.rtinetwork.org/learn/rti-in-secondary-schools/response-to-intervention-in-secondary-schools>

⁵⁷² "What Is RTI?" RTI Action Network. <http://www.rtinetwork.org/learn/what/whatisrti>

⁵⁷³ [1] VanDerHeyden, A. "Examples of Effective RtI Use and Decision Making: Part 1—Overview." RTI Action Network. <http://www.rtinetwork.org/essential/assessment/data-based/examples-of-effective-rti-use-and-decision-making-part-1-overview> [2] VanDerHeyden, A. "Examples of Effective RtI Use and Decision Making: Part 3 - Mathematics." RTI Action Network. <http://www.rtinetwork.org/essential/assessment/data-based/examples-of-effective-rti-use-and-decision-making-part-3-mathematics>

⁵⁷⁴ "Ten Steps to Make RTI Work in Your Schools." Education Policy Center, American Institutes for Research, April 2017. pp. 2–9. <https://rti4success.org/sites/default/files/10-RTI.pdf>

⁵⁷⁵ "What Is RTI?," Op. cit.

⁵⁷⁶ Ehren, "RTI in Secondary Schools: Is It on Your Radar Screen?," Op. cit.

⁵⁷⁷ Content adapted from: "Tiered Interventions in High Schools: Using Preliminary 'Lessons Learned' To Guide Ongoing Discussion." Center on Response to Intervention, American Institutes for Research, May 2010. p. 2. https://rti4success.org/sites/default/files/HSTII_LessonsLearned.pdf

RTI provides every student with high quality, research-based instruction. All students receive a universal screener in order to identify the students who are at-risk of falling behind academically, and these students identified as needing additional support receive different levels of intervention in a tiered instruction model. Progress monitoring and data driven instruction determine what type of learning is needed, whether interventions are effective, and if students need to move to a different tier.⁵⁷⁸

Unlike traditional tracking, students can move between tiers depending on their progress related to content and skills. A screener identifies which tier students should start in, but using progress monitoring, students may move to other tiers of instruction throughout the school year.⁵⁷⁹

Tiered Instruction of RTI Framework

Tier 1

- Evidence-based core curriculum and instruction aligned to standards
- All students receive Tier 1 instruction
- 80-85% (50-75% for schools new to an RTI model) of students will reach successful competency with this instruction

Tier 2

- Supplemental small group intervention
- For students who fall below expected levels of accomplishment and show high risk, as determined through assessment
- Targets 10-15% of students

Tier 3

- Provided to students who are not benefiting from Tier 2 and require more intensive assistance
- One-on-one tutoring, special education services
- Targets 3-5% of students

Source: RTI Action Network⁵⁸⁰

Tier 2 and Tier 3 interventions have different levels of intensity, with Tier 3 at times working on basic, fundamental skills. Tier 3 students receive longer, daily intervention. Lastly, the frequency of progress monitoring increases with each level. For instance, Tier 2 students should be monitored for progress on a weekly basis, whereas Tier 1 students could be monitored less frequently.⁵⁸¹

IMPLEMENT THE RTI MODEL IN HIGH SCHOOL MATHEMATICS

When applying RTI model to high school mathematics instruction, it is important that educators identify:⁵⁸²

- **A universal screener:** Using a reliable screener to identify students at risk for mathematics difficulties is an essential part of the RTI model. The screener should be based on content covered by the standards, used in conjunction with other annual tests, and occur at the beginning and middle of the year.
- **A system for monitoring student learning:** Students at each tier of instruction will need progress monitoring assessments to check for understanding. Some mathematics curricula have built-in progress monitoring quizzes or tasks, and some have leveled progress monitoring assessments that could be used in different tiers. However, not all schools have access to these resources. Teachers

⁵⁷⁸ Ibid.

⁵⁷⁹ Shapiro, E. "Tiered Instruction and Intervention in a Response-to-Intervention Model." RTI Action Network. <http://www.rtinetwork.org/essential/tieredinstruction/tiered-instruction-and-intervention-rti-model>

⁵⁸⁰ Content adapted from: Ibid.

⁵⁸¹ Ibid.

⁵⁸² Preceding and bulleted content adapted from: VanDerHeyden, A. "RTI and Math Instruction." RTI Action Network. <http://www.rtinetwork.org/learn/what/rtiandmath>

must decide on a system that works for their classroom and draw on their district's resources and free online assessments, or create their own.

- **An effective delivery of interventions:** Teachers should continue effective mathematics instruction, as RTI is the framework in which teachers apply their evidenced-based strategies. However, the learning tasks used in Tier 1 curriculum may not be appropriate in Tier 2. Some schools elect to purchase a supplemental intervention curriculum for Tier 2 or Tier 3 instruction.

Notably, RTI at the secondary level is growing in popularity, but research and implementation practices are not as widely available as those for use at the elementary level.⁵⁸³ Ultimately, **how a school embraces the RTI model will influence its effectiveness**,⁵⁸⁴ and individual schools and leaders must be flexible to discover how the framework can fit their setting.⁵⁸⁵

Comparing RTI Implementation in Elementary and High School

| SIMILARITIES | DIFFERENCES |
|---|---|
| <ul style="list-style-type: none"> ■ The same five essential components ■ Still a preventative framework; however, it prevents the consequences of poor academic achievement, such as dropping out and social alienation ■ A screener and progress monitoring still driver of decision-making and tiered instruction | <ul style="list-style-type: none"> ■ High schools have different structures that require creative solutions to provide tiered instruction ■ Tier 2 may be divided into different groups depending on the interventions needed by the students and the size of the group |

Source: Multiple⁵⁸⁶

The structure of high school can make it challenging to provide tiered instruction. High schools will have to consider who, what, how, and how long interventions will be implemented.⁵⁸⁷ The following are ways that high schools have provided Tier 2 and 3 interventions:⁵⁸⁸

- **Separate intervention class:** Students receive Tier 2 and Tier 3 intervention in a separate class, typically in place of an elective course. Unlike traditional tracking, students can exit these interventions during semester breaks. If they reach mastery during the semester, they are provided differentiated instruction with the core content.
- **Academic support structures:** Some high schools have scheduled blocks for academic supports that can be used by teachers to provide intervention outside of the general ed Tier 1 class. These may be support periods, co-lab classes, or seminars.
- **Integration in general education class:** Tier 2 instruction is delivered in small groups within the large group class. This organization puts the RTI model in the Tier 1 classroom with the general education teacher. Because of time and resources, Tier 3 interventions will either need to be pulled out or alternate days. This is an option for schools that do not have multiple teachers in a classroom or a school wide RTI system.

⁵⁸³ Muoneke, A. and L. Shankland. "Uncharted Territory: Using Tiered Intervention to Improve High School Performance." SEDL Archive, November 2009. <http://www.sedl.org/pubs/sedl-letter/v21n01/tiered.html>

⁵⁸⁴ "Tiered Interventions in High Schools: Using Preliminary 'Lessons Learned' To Guide Ongoing Discussion," Op. cit., p. 3. [2] "RTI Gets Promoted to Secondary Schools." NCLD Talks, 2007. <https://ncldtalks.org/content/interview/detail/1202/>

⁵⁸⁵ Duffy, H. "Meeting the Needs of Significantly Struggling Learners in High School: A Look at Approaches to Tiered Intervention." *National High School Center*, 2007. p. 3. <https://eric.ed.gov/?id=ED501084>

⁵⁸⁶ Contents adapted from: [1] "Tiered Interventions in High Schools: Using Preliminary 'Lessons Learned' To Guide Ongoing Discussion," Op. cit. [2] Duffy, Op. cit. [3] Ehren, "RTI in Secondary Schools: Is It on Your Radar Screen?," Op. cit.

⁵⁸⁷ Ehren, "RTI in Secondary Schools: Is It on Your Radar Screen?," Op. cit.

⁵⁸⁸ Bulleted text adapted from: [1] "Tiered Interventions in High Schools: Using Preliminary 'Lessons Learned' To Guide Ongoing Discussion," Op. cit., p. 5. [2] "Reaching All High School Students: A Multi-Tiered Approach." Edutopia, 2014. https://www.youtube.com/watch?v=-_lqi7KYKTA [3] "RTI in Middle Schools: The Essential Components." Center on Response to Intervention, American Institutes for Research, 2013. <https://rti4success.org/sites/default/files/RTI%20in%20Middle%20Schools-The%20Essential%20Components.pdf>

- **Co-teaching:** A second teacher provides Tier 2 and/or Tier 3 supports by pushing into the Tier 1 classroom. At times another specialist pushes in or pulls out Tier 3 intervention groups.
- **Specialized teacher:** Typically with Tier 3 instruction, an interventionist pulls students to receive intervention.



Convert to Action

Reflect on these questions to think about how this could be implemented in the classroom.

- Is meeting all students' learning needs a growing issue in your school? How could a model like RTI help you consider every student's learning?
- Does your school already use or collect data? Do you have access to it?
- Do the students receive a screener for math?
- Consider the organization and support systems of your school – which of the structures for tiered instruction would work best for you?

USE DATA TO DRIVE INSTRUCTION

IMPLEMENT THE DATA INQUIRY CYCLE

In order to differentiate their instruction or leverage a tiered instructional model like RTI, teachers will depend on data. Specifically, teachers must understand what students know before, during, and after they have been taught certain content.⁵⁸⁹ However, while the benefits of implementing a data inquiry cycle are numerous, it is time consuming and must be done with fidelity. For a secondary math class with diverse learners, using data will allow teachers to decide what pre-teaching may be necessary, whether a topic is needed for whole group or small group instruction, how to use Tier 1 instruction to target 80% of the class, and how to differentiate student groups.⁵⁹⁰ Teachers must also be aware of common mistakes that impede data-driven instruction, as outlined below.

Mistakes That Impede Successful Data Driven Instruction

- **Inferior assessment:** not aligned to information needed by teacher
- **Infrequent assessments:** not frequent enough to provide data to guide daily instruction
- **Delayed results:** not graded and analyzed promptly for teacher to make adjustments to instruction
- **Ineffective follow up:** a vague commitment without a specific plan for improvement nor a time set to implement the plan
- **Not making time for data:** teachers are busy and if it is not prioritized, it simply won't happen

Source: Driven By Data⁵⁹¹

COLLECT DATA

Collecting data is the crux of the data inquiry cycle. The analysis and intervention of data all depend on the quality of the data, its alignment to the information the teacher needs, and the timing of data collection.⁵⁹² There are many types of assessments that are appropriate for different goals, and knowing what types of assessment to give will influence how the data are used.⁵⁹³

⁵⁸⁹ VanDerHeyden, "RTI and Math Instruction," Op. cit.

⁵⁹⁰ "Using Data Research Clip." National Council of Teachers of Mathematics. <https://www.nctm.org/Research-and-Advocacy/Research-Brief-and-Clips/Using-Data/>

⁵⁹¹ Bambrick-Santoyo, P. *Driven by Data: A Practical Guide to Improve Instruction*. Jossey-Bass, 2010. p. xxvi.

⁵⁹² Alber, R. "3 Ways Student Data Can Inform Your Teaching." Edutopia, 2017. <https://www.edutopia.org/blog/using-student-data-inform-teaching-rebecca-alber>

⁵⁹³ [1] "Role of Assessment in RTI." Pearson. https://images.pearsonclinical.com/images/ca/rti/RTI_role.htm [2] Sparks, S.D. "Types of Assessments: A Head-to-Head Comparison." Education Week, November 9, 2015. <https://www.edweek.org/ew/section/multimedia/types-of-assessments-a-head-to-head-comparison.html>

Types of Assessments to Use in RTI

| TYPE | PURPOSE | ADMINISTRATION | EXAMPLES |
|--|--|---|--|
| Universal Screener | Early testing to determine if students are at-risk in any subject area | 1-3 times per year | <ul style="list-style-type: none"> ▪ iReady ▪ Iowa Algebra Aptitude Test ▪ Algebra 1 Readiness Test ▪ MAP Growth |
| Diagnostic/ Pre-Assessment | Testing prior to instruction to identify what students know | Before a new unit or topic of learning | <ul style="list-style-type: none"> ▪ Anticipation guides ▪ Quiz ▪ Surveys ▪ Tasks |
| Progress-Monitoring/ Formative Assessment | Monitoring student learning throughout the instruction | Used regularly and frequently, weekly or even daily | <ul style="list-style-type: none"> ▪ Exit tickets ▪ Quizzes ▪ Observations ▪ Student Work |
| Outcome/ Summative Assessment | Evaluate learning after the material has been taught | At the end of a unit or after a topic is taught | <ul style="list-style-type: none"> ▪ Standardized tests ▪ End of unit exams |

Source: Multiple⁵⁹⁴

The following questions will assist teachers in determining what data to collect:⁵⁹⁵

- **What do you want to know?** If it is the beginning of the year, teachers can start by analyzing annual tests given at the end of the previous year or a screener. Ask: what standards or “take away” points do students *really* need to understand from this unit/week/lesson?
- **What type of assessment fits your needs and when it will be given?** Consider when the assessment will be administered. Will it be given before, during, or after instruction?
- **Will you create the assessment or is it already available?** Sometimes it is worth creating assessments to ensure alignment with both instruction and the standards. Other times, it is beneficial to use the well-vetted resources available.
- **When will it be administered?** Set an administration date to ensure the data collection happens at the appropriate time to match the instructional intent.

In a class with diverse and varying student needs, administering frequent pre-assessments will guide the teacher towards the appropriate starting points for Tier 1 instruction and Tier 2 and 3 groupings. Quick pre-assessments with a few questions will not intrude significantly on class time or give students testing burnout. A continuum of questions that begins with background knowledge and progresses through acquired levels of understanding will help determine what understanding students have.⁵⁹⁶

⁵⁹⁴ Contents adapted from: [1] Lesaux, N. and S. Marietta. *Making Assessment Matter: Using Test Results to Differentiate Reading Instruction*. The Guilford Press, 2012. [2] Alber, Op. cit. [3] Pendergrass, E. “Differentiation: It Starts with Pre-Assessment.” ASCD, 2014. http://www.ascd.org/publications/educational_leadership/dec13/vol71/num04/Differentiation@_It_Starts_with_Pre-Assessment.aspx [4] Hamilton, L. et al. “Using Student Achievement Data to Support Instructional Decision Making.” Institute of Education Sciences. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/dddm_pg_092909.pdf [5] “Progress Monitoring Within a Response-to-Intervention Model.” RTI Action Network. <http://www.rtinetwork.org/learn/research/progress-monitoring-within-a-rti-model>

⁵⁹⁵ Bulleted text adapted from: [1] Dyer, K. “8 Questions Teachers Should Ask When Giving Assessments.” Northwest Evaluation Association, August 28, 2014. <https://www.nwea.org/blog/2014/8-questions-teachers-ask-giving-assessments/> [2] “7 Questions You Need to Ask About Assessment.” 11.30.17. <https://www.cem.org/blog/7-questions-you-need-to-ask-about-assessment/>

⁵⁹⁶ Small, M. and A. Lin. *More Good Questions: Great Ways to Differentiate Secondary Mathematics Instruction*. Teachers College Press, 2010. pp. 4–5.

It is important to not assume what students know and do not know, as there may be gaps in the students' previous learning. Using frequent formative assessments to check for student understanding throughout the unit allows teachers to gauge how the instruction is progressing rather than realizing misconceptions and errors at the end of the unit. These informal assessments allow teachers to adjust student groupings and instructional methods to meet students' needs.⁵⁹⁷

Teachers may also include reasoning in the assessment, as asking students to explain the "why" or "how" of a problem benefits both the teacher and student. Secondary students should be able to explain their rationale in solving a problem, which increases their understanding and metacognitive awareness. Likewise, the teacher is more effective at addressing misconceptions of content, as the students' thinking is visible for review. Example prompts may include: "Explain how you found your answer" or "Explain why you responded this way."⁵⁹⁸

In Algebra 1 specifically, a number of screening tools are available to provide these foundational data to teachers,⁵⁹⁹ as analyzing a screener can start the data cycle at the beginning of the year. The National Center on Intensive Intervention has an interactive chart that can provide more details on screeners, including both free and paid screeners.⁶⁰⁰

Screening Tools for Algebra 1

| FREE ALGEBRA 1 SCREENERS | SECONDARY SCREENERS WITH A FEE |
|---|---|
| <ul style="list-style-type: none"> Parent Letter, 7th Grade Skills, 8th Grade Skills - Grand Prairie Algebra Readiness Assessment - Algebra Class Is your child ready for algebra success? - Mathnasium Algebra Readiness Diagnostic - Napa Valley College Algebra Readiness Test - Pierce College | <ul style="list-style-type: none"> Algebra 1/Integrated Math 1 Readiness Test - Knowledge Tools Iowa Algebra Aptitude Test - Riverside Insights Math Inventory - Houghton Mifflin Harcourt iReady - Curriculum Associates MAP Growth - NWEA Star Math - Renaissance |

Source: Multiple

ANALYZE DATA

This step of the data inquiry cycle converts data from raw numbers to plans for instruction that support student learning.⁶⁰¹ This is the step of the data cycle that can be time consuming but is essential to produce impacts on student learning. **When analyzing data, teachers ask questions, find patterns among the data, and form hypotheses of how instruction or grouping can be adjusted to meet their students' needs.**⁶⁰²

During the grading process or after, depending on each teacher's preference, assessment results are analyzed to find root causes of misunderstanding. To plan effective interventions, teachers must identify and investigate student misconceptions. In math, misconceptions fall into three categories:⁶⁰³

- **Vocabulary misconceptions** require reteaching focused on the misunderstood language.

⁵⁹⁷ "Progress Monitoring Within a Response-to-Intervention Model," Op. cit.

⁵⁹⁸ Holmes, V.-L. et al. "Data-Driven Intervention: Correcting Mathematics Students' Misconceptions, Not Mistakes." *The Mathematics Educator*, 23:1, 2013. p. 38. <http://tme.journals.libs.uga.edu/index.php/tme/article/view/261>

⁵⁹⁹ [1] "Tiered Interventions in High Schools: Using Preliminary 'Lessons Learned' To Guide Ongoing Discussion," Op. cit., p. 4. [2] "RTI in Middle Schools: The Essential Components," Op. cit.

⁶⁰⁰ "Academic Screening Tools Chart." National Center on Intensive Intervention. <https://charts.intensiveintervention.org/chart/academic-screening>

⁶⁰¹ Rouda, R. "A Framework for Effective Data Use in Schools." Learning for Action. <http://learningforaction.com/lfa-blogpost/data-matters-framework>

⁶⁰² "Using Data Research Clip," Op. cit.

⁶⁰³ Preceding and bulleted text adapted from: Holmes et al., Op. cit., pp. 34-38.

- **Computation errors** should be further examined to determine if there is a calculational inaccuracy or whether the error was a sign of erroneous belief.
- **Erroneous belief misconceptions** are the root cause of mathematical misunderstandings. Including reasoning explanations in assessments will greatly help teachers identify erroneous beliefs.

Teachers may choose to analyze student data using different protocols depending on the assessment and need and can analyze one assessment using multiple protocols to provide a deeper understanding of student learning. This is most useful for summative assessments or critical units of study. However, this process is also time consuming. As this is the step of the data inquiry cycle that can be cumbersome, it is important to find strategies that are both effective and efficient.⁶⁰⁴

The four protocols on the following pages can help teachers identify students meeting or failing to meet expectations and the different forms of student errors that may be occurring.

⁶⁰⁴ "Using Data and Formative Assessment to Drive Instruction." Research for Better Teaching, 2016.
https://www.siprep.org/uploaded/ProfessionalDevelopment/Minutes/Using_Data_Formative_Assessment_St.Ignatius_MAHs_Oct_2016.pdf



Quick Sort Protocol

Directions: First, sort the assessments into three piles – does not yet meets expectations, meets expectations, or exceeds expectations. Record the number of student work in each pile. Then, analyze the piles and make notes about errors, misconceptions, gaps, and insights. Use these notes to modify instruction in small groups or whole class.

The categories can be changed depending on the assessment and expectations. For example, on a two question exit ticket using “not yet,” “approaching,” and “meets” could better fit the teacher’s needs.

Mastery Objective:

| | NOT YET | MEETS | EXCEEDS |
|---|---------|-------|---------|
| Number of Students in Each Category | | | |
| Notes describing errors, misconceptions, gaps, and insights | | | |

Source: Research For Better Teaching⁶⁰⁵

⁶⁰⁵ Tool adapted from: Ibid., p. 62.



Root Cause Protocol 1

Directions: This protocol can be used for content that students are not understanding overall or it can be used with work samples from the Tier 2 or Tier 3 intervention groups. Go through student work and note misconceptions and errors for each criterion. Use this data to form intervention groups, reteach, and/or plan instruction in a new way.

| CRITERION | POSSIBLE ROOT CAUSES OF WHY A CRITERION WASN'T MET OR WHY AN ERROR WAS MADE |
|-----------|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Source: Research For Better Teaching⁶⁰⁶

⁶⁰⁶ Tool adapted from: Ibid., p. 64.



Root Cause Protocol 2

Directions: This is a simple problem-solving activity to get to the root cause of a problem. Choose a common misconception or error that students are making and ask, “why?” Repeat this question until the root cause is discovered.

Everyday Example: The car gets a flat tire.

Why? You ran over nails in your garage.

Why? The box of nails on the shelf got wet, fell apart, and the nails fell on the floor.

Why? There is a leak in the roof, and it rained the night before.

Root cause – leak on the roof

*If questioning stopped after the second why, the root cause would have been missed.

| Problem Statement: | |
|--------------------|--|
| Why? | |
| Why? | |
| Why? | |
| Root Cause(s) | <ol style="list-style-type: none">1.2.3. <p>To validate root causes ask the following: If you removed this root cause, would this problem have been prevented?</p> |

Source: State of New Jersey Department of Education⁶⁰⁷

⁶⁰⁷ Tool adapted from: “Collaborative Teams Toolkit.” State of New Jersey Department of Education. p. 20.
<https://www.state.nj.us/education/AchieveNJ/teams/Toolkit.pdf>



Error Analysis Protocol

Directions: While analyzing student work, notice common misconceptions and errors. Record types of errors along the top of the columns. Highlight or check the box next to each student who has that error or misconception. This can be used to plan interventions, reteach, or pull small groups.

Ask:

- What might students have been thinking to make this error? How can we find out if that is true?
- What different instructional strategies could we use to fix/undo whatever led to this error and help students solidify their understanding?
- How can we plan time to teach this?

| POSSIBLE ERRORS → | ERROR A: | ERROR B: | ERROR C: | ERROR D: |
|----------------------|----------|----------|----------|----------|
| STUDENTS: | | | | |
| Student 1 | | | | |
| Student 2 | | | | |
| Student 3 | | | | |
| Student 4 | | | | |
| Student 5 | | | | |
| Student 6 | | | | |
| Student 7 | | | | |
| Student 8 | | | | |
| Student 9 | | | | |
| Student 10 | | | | |
| Student 11 | | | | |
| Student 12 | | | | |
| Student 13 | | | | |
| Student 14 | | | | |
| Student 15 | | | | |
| Student 16 | | | | |
| Student 17 | | | | |
| Student 18 | | | | |
| Student 19 | | | | |
| Student 20 | | | | |

Source: Research for Better Teaching⁶⁰⁸

⁶⁰⁸ Tool adapted from: "Using Data and Formative Assessment to Drive Instruction," Op. cit., pp. 69, 71.

PLAN INTERVENTIONS

Analyzing data lends itself to the next step of the inquiry cycle – planning the intervention. The teacher now knows which students may need intervention, what misconceptions need to be addressed, and the root causes of confusion, and can plan instruction that will address learning needs. Class-wide misconceptions should be addressed in Tier 1 instruction.⁶⁰⁹ To determine a Tier 2 intervention group, the teacher should establish a cut score, and students who score below the cut score on the screener or progress-monitoring assessments are potentially at risk.⁶¹⁰ Notably, some schools give a diagnostic assessment to students who score below the screener cut score to gather more information about each student’s strengths and weaknesses.⁶¹¹

Teachers can think through an instructional plan by asking these questions:⁶¹²

- Have students mastered prerequisite skills? Does instruction match student proficiency?
- How many groups of intervention instruction are needed to meet their needs?
- What does the data tell us? What does the data not tell us?
- Is there a trend that is holding these students back?
- From the student’s perspective, what is the student working on?
- What else would you like to see in the student’s work? What kinds of assignments or assessments could provide this information?
- What steps could the teacher take next with this student?
- What teaching strategies might be most effective?
- What will be the most important thing to focus on to move each group forward? How can you target this gap in your planning and instruction?

"Intervention Lesson Plans 1 and 2" on the following pages can help teachers plan out instruction and assessment to determine if an intervention works. As students are assessed following an intervention, the data inquiry cycle begins again. Section 3 of this toolkit addresses effective instructional strategies for Tier 2 interventions.

⁶⁰⁹ VanDerKeyden, A. "Examples of Effective RtI Use and Decision Making: Part 1 - Overview." RTI Action Network. p. 1.
<http://www.rtinetwork.org/essential/assessment/data-based/examples-of-effective-rti-use-and-decision-making-part-1-overview>

⁶¹⁰ "RTI in Middle Schools: The Essential Components," Op. cit., p. 4.

⁶¹¹ Ibid.

⁶¹² Bulleted text adapted from: [1] VanDerKeyden, Op. cit., p. 1.[2] "Data Protocols." Oakland Unified School District.
<http://qualitycommunityschools.weebly.com/data-protocols.html> [3] Analyzing Student Work for Actionable Trends." Achievement Network.
<https://static1.squarespace.com/static/5321dc4ae4b0c72ad0ceedfe/t/59c4289ff5e231e35360aa52/1506027679821/Protocol+for+Analyzing+Student+Work+for+Actionable+Trends+in+Math.pdf> [4] "Atlas - Learning From Student Work." National School Reform Faculty. https://www.nsrffharmony.org/wp-content/uploads/2017/10/atlas_lfsw_0.pdf



Intervention Lesson Plan 1

Directions: This tool can be used to organize and plan the components of an intervention lesson plan.

| STANDARD/SKILL | HOW STANDARD/ SKILL WAS PREVIOUSLY TAUGHT | PLAN FOR POST-ASSESSMENT INSTRUCTION WHOLE GROUP/SMALL GROUP/INDIVIDUAL | ASSESSMENT |
|----------------|--|---|--|
| | | Small Group Members: Common Student Misconceptions/Misunderstandings: Learning Targets: Instructional Strategies to Teach: Resources and Materials: Dates of Instruction: | Re-assessment measure: Re-assessment outcome: |

Source: EL Education⁶¹³

⁶¹³ Tool adapted from: VanDerKeyden, A. "Effective RtI Decision Making: Overview." RTI Action Network.
<http://www.rtinetwork.org/essential/assessment/data-based/examples-of-effective-rti-use-and-decision-making-part-1-overview>



Intervention Lesson Plan 2

Directions: This tool can be used to organize and plan the components of an intervention lesson plan.

| INTERVENTION DESCRIPTION <i>Describe each intervention that you plan to use.</i> | INTERVENTION DELIVERY <i>List key details such as when, how frequently, materials, and who.</i> | CHECK-UP DATE <i>Select a date when students will be assessed to evaluate the intervention.</i> | ASSESSMENT DATA | |
|---|--|--|-----------------|------------|
| | | | Baseline Data | Final Data |
| | | | Baseline Data | Final Data |
| | | | Baseline Data | Final Data |

Source: Oakland Unified School District⁶¹⁴

⁶¹⁴ Tool adapted from: "Data Protocols," Op. cit.

PLAN EFFECTIVE MATH INSTRUCTION

DESIGN TIERED INSTRUCTION

The National Council of Teachers of Mathematics (NCTM) recommends research-based teaching practices that include rich conversations, engaging in productive struggle, and collaboration. The traditional lecture-based, teacher-centered, scripted instruction does not align with best practices in math instruction.⁶¹⁵ Instead, using a *workshop model* in the classroom moves away from teacher-led, whole group instruction and allows students to spend most of the instructional block immersed in the content while the teacher facilitates.

The workshop model is a flexible framework, with four components that can be changed based on the needs of the students or the target content:⁶¹⁶

- **Opening** (a few minutes): This time could be used for the teacher to introduce the lesson or present a task or activity. It could also be used for students to complete a warm-up, task, or routine with foundational skills.
- **Mini-Lesson** (10-15 minutes): This is a shortened lesson with explicit modeling and guided practice for students to be exposed to the concept. The "**Mini Lesson Template**" on the following page can support planning for this component.
- **Work Time** (30 minutes): Students work on the math concepts. This block is very flexible and could include any of the following: independent tasks or activities, stations, peer or group work, must/may do activities, or any other task in which students are working on math concepts. While the students are working, teachers facilitate and support student learning. This could be: Tier 2 or Tier 3 intervention, conferring in small groups, or supporting individual students. If teachers notice a common misunderstanding, they may reteach certain concepts.
- **Closure/Reflection** (a few minutes): This is a way for students to come together and reflect on their learning. Teachers may ask students to complete an exit ticket to show understanding, "turn and talk" to share a new understanding, or share their work and strategies with the class.

Depending on the timing of the math instructional block, another way to partition the workshop components is 1/3 teacher-led (mini-lesson, opening/closure) and 2/3 work time.⁶¹⁷ Using the workshop model is a framework to organize instruction, but every teacher will implement it in a way that fits their teaching style.⁶¹⁸ For example, teachers may include all of the workshop components on some days, but only one or two on other days. The workshop model provides the time teachers need for differentiation and gives teachers the opportunity to perform Tier 2 and possibly Tier 3 interventions during the Tier 1 instructional block. While Tier 1 students work independently during work time, the teacher can pull Tier 2 intervention groups.⁶¹⁹

⁶¹⁵ Sharp, L., G. Bonjour, and E. Cox. "Implementing the Math Workshop Approach: An Examination of Perspectives among Elementary, Middle, and High School Teachers." *International Journal of Instruction*, 12, January 3, 2019. p. 70. [2] "Minimize Lecture, Maximize Learning: Workshop Model." Education World. https://www.educationworld.com/a_curr/minimize-lecture-workshop-model.shtml

⁶¹⁶ Bulleted text adapted from: Sharp, Bonjour, and Cox, Op. cit.

⁶¹⁷ "Minimize Lecture, Maximize Learning," Op. cit.

⁶¹⁸ "Planning Effective Lessons." EL Education, 2018. p. 22. <https://eleducation.org/resources/cp-10-planning-effective-lessons>

⁶¹⁹ "Planning Effective Lessons," Op. cit.



Mini Lesson Template

Description: This template can be used to plan the explicit modeling and guided practice of the mini-lesson.

| | |
|---|--|
| Connect: (1-2 min) Students learn why today's instruction is important to them as mathematicians and how the lesson relates to their prior work. The teaching point is stated. | |
| Direct Instruction: (3-4 min) The teacher directs instruction by: developing an anchor chart, explicit teacher modeling of skill or strategy, presentation of a problem solving scenario. | |
| Guided Practice: (5 minutes) The teacher guides students as they work alone or with peers to try the new math skill or strategy. | |
| Send Off: (1-2 min) Students are told what their work time tasks are to complete. | |

Source: Multiple⁶²⁰

⁶²⁰ Tool adapted from: [1] Sharp, Bonjour, and Cox, Op. cit. [2] "What Is Math Workshop?" Washusett Regional School District. <http://www.wrsdcurriculum.net/Mathematics.html> [3] "The Architecture of a Minilesson." Stanford Department of Education. http://insidewritingworkshop.stanford.edu/profdev/materials/bw_minitemplate.pdf [4] "Minimize Lecture, Maximize Learning," Op. cit.

When planning instruction for Tier 2 and Tier 3 interventions, it is critical that strategies and lesson plans are both realistic and manageable. If teachers cannot provide the intervention, then the process has failed student learning.⁶²¹ Interventions should also be purposeful and use evidence-based instructional strategies.⁶²²

The chart below compiles recommendations for from the RTI Network, NCTM, Center on Instruction (COI), and What Works Clearinghouse (WWC) for the Institute of Education Sciences. Teachers can use these strategies and recommendations to improve instruction and interventions at all three tiers of RTI.

Effective Instructional and Intervention Strategies for Math Classrooms

| Recommendation | Description |
|---|--|
| Explicit instruction | Teachers should model multiple examples for students while thinking aloud. <i>As this was the most emphasized best practice recommended by all four organization, it will be expanded upon further in subsequent pages.</i> |
| Instruction on solving word problems | WWC recommends teaching students the structure of word problems and how to transfer familiar solution methods to unfamiliar problems. The RTI Network similarly recommends starting with foundational skills, and then teaching students scaffolded problems that have the same structure as the core curriculum. Finally, students will learn to apply the same process to grade level word problems. For instance, teaching adding and subtracting decimals with raw numbers. Then, teach strategies for adding and subtracting whole number word problems. Finally, students access grade-level content by applying the same strategies to adding and subtracting decimal word problems. |
| Use visual representations | WWC, COI, and NCTM recommend using visual representations such as arrays, number lines, and strip diagrams. If more scaffolding is needed, concrete manipulatives can be used to build understanding if applicable. However, students should eventually be weaned off of these scaffolds and solve problems with abstract strategies. |
| Drill and practice | The RTI Network and NCTM both recommend that students who are receiving interventions should receive extensive practice with new skills. Practice should be mixed with review and many problem types. WWC also advises allocating 10 minutes to build basic arithmetic facts. Older students should use commutative, associative, and distributive properties to derive facts. |
| Ease the learning challenge | WWC and COI recommend purposefully choosing and sequencing problems for both modeling and guided practice from easy/simple to difficult/complex. This can be done by anticipating and eliminating misunderstandings through explanation and problem modeling. |
| Match task difficulty | The RTI Network reminds teachers that intervention is not repetition of the Tier 1 instruction. The tasks should be scaffolded to match the students' zone of proximal development. Data analysis and observation can reveal what skills students are developing and instruction should build on that foundation. |
| Progress Monitoring | NCTM, WWC, and COI emphasize frequent progress monitoring for Tier 2 and 3 groups. Having a "pulse" on students who are struggling gives the teacher insight on student understanding and misconceptions in order to build effective intervention plans. |
| Motivation Strategies | Students who are receiving Tier 2 and Tier 3 instruction most likely have experienced failure and discouragement in math before. WWC recommends that students be included in the data process and chart their progress. The RTI Network adds that self-assessment and a positive learning mindset should be incorporated. |

Source: Multiple⁶²³

⁶²¹ "Using Data Research Clip," Op. cit.

⁶²² Lam, L. et al. "Evidence-Based Interventions: A Guide for States." Learning Policy Institute, March 31, 2016.
<https://learningpolicyinstitute.org/product/evidence-based-interventions>

⁶²³ [1] Jayanthi, M., R. Gersten, and S. Baker. "Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics." Center on Instruction, 2008.

As noted in the previous figure, explicit instruction was highlighted as the primary recommendation for math intervention from many reputable organizations.⁶²⁴ Explicit instruction includes not only clear modeling, but the gradual release of responsibility as the teacher intentionally and clearly models and then guides students to take on their learning independently. The following are components of explicit instruction:⁶²⁵

- The teacher clearly models with multiple examples;
- Example problems are purposefully sequenced;
- The teacher thinks out loud while modeling to demonstrate to students the thinking they should also do in their heads;
- Students solve problems in groups;
- Students communicate their strategies and think aloud in a group;
- Students receive extensive practice; and
- The teacher provides students with timely feedback of their progress.

Teachers should not view interventions as a list of strategies to be checked off and applied, but as a process to discover what students need to progress through critical content. Teachers should ask themselves, “What do I need to do and plan to make that happen?”⁶²⁶ One common pitfall in Tiers 2 and 3 is that teachers underestimate how much scaffolding students will need.⁶²⁷

SUPPORT LEARNING IN ALGEBRA

Specifically related to algebra knowledge, the WWC recommends three strategies for middle and high school students:⁶²⁸

- Use solved problems to analyze algebraic reasoning and strategies;
- Teach students to utilize the structure of algebraic representations; and
- Teach students to intentionally choose from alternative algebraic strategies when solving problems.

The following subsections examine these strategies in further detail, and the practice guide found here contains examples to support implementation.

<https://www.centeroninstruction.org/files/Mathematics%20Instruction%20LD%20Guide%20for%20Teachers.pdf> [2] “What Instructional Strategies Are Effective in Helping Students with Difficulties in Mathematics?” NCTM Research Clip. https://www.nctm.org/uploadedFiles/Research_and_Adv [3] Gersten, R. et al. “Assisting Students Struggling with Mathematics: Response to Intervention (RTI) for Elementary and Middle Schools.” Institute of Education Sciences, 2009. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/rti_math_pg_042109.pdf [4] Fuchs, L. “Mathematics Intervention at the Secondary Prevention Level of a Multi-Tier Prevention System: Six Key Principles.” RTI Action Network. <http://www.rtinetwork.org/essential/tieredinstruction/tier2/mathintervention>

⁶²⁴ [1] Jayanthi, Gersten, and Baker, Op. cit. [2] “What Instructional Strategies Are Effective in Helping Students with Difficulties in Mathematics?” Op. cit. [3] Gersten et al., Op. cit. [4] Fuchs, Op. cit.

⁶²⁵ [1] Gersten et al., Op. cit. [2] Fuchs, Op. cit. [3] “What Instructional Strategies Are Effective in Helping Students with Difficulties in Mathematics?” Op. cit. [4] Jayanthi, Gersten, and Baker, Op. cit.

⁶²⁶ Tomlinson, C. and M. Imbeau. “Understanding Differentiation in Order to Lead: Aiming for Fidelity to a Model.” ASCD, November 2010. <http://www.ascd.org/publications/books/108011/chapters/Understanding-Differentiation-in-Order-to-Lead@-Aiming-for-Fidelity-to-a-Model.aspx>

⁶²⁷ Gersten, Beckmann, Clarke, Foegen, Marsh, et al., Op. cit., p. 24.

⁶²⁸ Star, J. et al. “Teaching Strategies for Improving Algebra Knowledge in Middle and High School Students.” Institute of Education Sciences, January 2019. p. 2. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/WWC_Algebra_PG_Revised_02022018.pdf

USING SOLVED PROBLEMS TO ANALYZE ALGEBRAIC REASONING

Students think abstractly when solving algebra problems, and the amount of complex information that has to be processed concurrently can hinder students' learning. Looking at solved problems allows students to see the problem and all the solution steps, and assists in their understanding. Discussing incomplete or incorrectly solved problems will also benefit learning.⁶²⁹

Teachers should select solved problems that reflect the lesson's instructional aim, including problems that illustrate common errors. Student work can be used as examples, and students should examine several problems on the same concept that range in complexity and articulation. This will help students recognize patterns and make connections to important content and skills.⁶³⁰

Strategies to Discuss Math Problems

| QUESTIONS TO FACILITATE THE DISCUSSION OF SOLVED PROBLEMS | QUESTIONS TO FACILITATE THE DISCUSSION OF THE STRUCTURE OF PROBLEMS |
|---|---|
| <ul style="list-style-type: none"> What were the steps involved in solving the problem? Why do they work in this order? Would they work in a different order? Could the problem have been solved with fewer steps? Can anyone think of a different way to solve this problem? Will this strategy always work? Why? How can you change the given problem so that this strategy does not work? What are other problems for which this strategy will work? | <ul style="list-style-type: none"> What quantities – including numbers and variables – are present in this problem? Are these quantities discrete or continuous? What operations and relationships among quantities does the problem involve? Are there multiplicative or additive relationships? Does the problem include equality or inequality? How are the parentheses used in the problem to indicate the problem's structure? |

Source: Institute of Education Sciences⁶³¹

Whole-class discussions, small-group work, and independent practice activities should all be used to introduce, elaborate on, and practice working with solved problems. For whole-class discussions, teachers should be prepared with questions to guide discussion, and for small-group work, they should draft questions for groups to answer. Comparatively, independent practice should present students with both solved problems and blank problems to encourage students to notice and apply the same steps⁶³²

Example of an Incompletely Solved Problem

| | | |
|-----------------|-------------------------------|------------------------------------|
| $-x + 7 \geq 9$ | $3(x + 2) + 12 \leq 4(1 - x)$ | $2(x + 7) - 5(3 - 2x) \geq 7x - 4$ |
| $-x \geq 2$ | | $2x + 14 - 15 + 10x \geq 7x - 4$ |
| | $3x + 18 \leq 4 - 4x$ | |
| | $7x \leq -14$ | $5x \geq -3$ |
| | $x \leq -2$ | $x \geq -\frac{3}{5}$ |

Source: Institute of Education Sciences⁶³³

USING THE STRUCTURE OF ALGEBRAIC REPRESENTATIONS

When students pay attention to the structure of algebra problems, they are able to make connections between problems that appear differently. Recognizing the similarities in structure will allow students to

⁶²⁹ Ibid., pp. 4–15.

⁶³⁰ Ibid., pp. 6–11.

⁶³¹ Ibid., pp. 5–6.

⁶³² Ibid., pp. 12–15.

⁶³³ Figure taken directly from: Ibid., p. 14.

apply the same solution method regardless of the form (e.g., symbolic, numeric, verbal, graphic). Teachers should promote language use that reflects proper mathematical structures and can teach students that different algebraic representations can convey different information about an algebra problem.⁶³⁴

Mathematical Structure Language

| IMPRECISE LANGUAGE | PRECISE MATHEMATICAL LANGUAGE |
|---|---|
| Take out the x. | <ul style="list-style-type: none"> Factor x from the expression. Divide both sides of the equation by x. |
| Move the 5 over. | <ul style="list-style-type: none"> Subtract 5 from both sides of the equation. |
| Use the rainbow method/FOIL. | <ul style="list-style-type: none"> Use the distributive property. |
| Solve an expression. | <ul style="list-style-type: none"> Solve an equation. Rewrite an expression. |
| A is apples. | <ul style="list-style-type: none"> Let a represent the number of apples. Let a represent the cost of the apples in dollars. |
| Plug in the 2. | <ul style="list-style-type: none"> Substitute 2 for x. |
| To simplify, flip it and multiply. To divide fractions, invert and multiply. | <ul style="list-style-type: none"> To simplify, multiply both sides by the reciprocal. To divide fractions, multiply by the reciprocal. |
| Do the opposite to each side. | <ul style="list-style-type: none"> Use inverse operations. Add the opposite to each side. |
| The numbers cancel out. | <ul style="list-style-type: none"> The numbers add to zero. The numbers divide to one. |
| Plug it into the expression. | <ul style="list-style-type: none"> Evaluate the expression. |

Source: Institute for Education Sciences⁶³⁵

In addition, teachers should encourage students to use reflective questioning to notice structure as they solve problems. Example questions include:⁶³⁶

- How would I describe this problem using precise mathematical language?
- Is this problem structured similarly to another problem I've seen before?
- How many variables are there? What am I trying to solve for?
- What are the relationships between quantities in this expression or equation?
- How will placement of quantities and operations impact what is done first?

INTENTIONALLY CHOOSING ALGEBRAIC STRATEGIES

Understanding and having many strategies gives students better access to algebra. They can solve problems flexibly, decide when to apply certain strategies, and choose strategies depending on the task. Thus, **teachers should help students recognize and generate strategies for solving problems and encourage them to articulate the reasons that motivated them to use a specific strategy.** After students apply one strategy, teachers should also encourage them to compare it with a new strategy to understand similarities and differences.⁶³⁷

⁶³⁴ Ibid., pp. 15–29.

⁶³⁵ Quoted verbatim from: Ibid., p. 18.

⁶³⁶ Bulleted text adapted from: Ibid., pp. 19–20.

⁶³⁷ Ibid., pp. 26–36.

Reflective Questions for Selecting and Justifying Solution Strategies

- What strategies could I use to solve this problem? How many possible strategies are there?
- Of the strategies I know, which seem to best fit this particular problem? Why?
- Is there anything special about this problem that suggests a particular strategy is applicable or a good idea?
- Why did I choose this strategy to solve this problem?
- Could I use another strategy to check my answer?
- What did you notice first about the problem structure? How did that influence your solution strategy? What strategy is appropriate for solving this problem, and why?
- What choices did you have to make in solving this problem?
- What goal were you trying to achieve?
- How did you get your answer? How do you know it is correct?
- Describe to another student how to solve this problem.
- What was most difficult about this problem? Did you run into any challenges? What did you do to overcome them?

Source: Institute of Educational Sciences⁶³⁸



Convert to Action

Reflect on these questions to think about how this could be implemented in the classroom.

- What workshop models do you think will be most useful in your classroom?
- How will you organize instruction and tasks during work time? Will you project a PowerPoint slide or have a bulletin board? Where will materials be so students do not disrupt your groups? What will they do if they finish?
- How will you break up long lessons into mini lessons?
- In what ways can incorporating solved problems, algebra vocabulary, and strategies fit into your lessons?

Source: Hanover Research⁶³⁹

⁶³⁸ Ibid., pp. 30, 33.

⁶³⁹ Figure reproduced verbatim from: "Toolkit: Reaching All Students in Secondary Math." Hanover Research, January 2020.

SECTION V: DEFINED STUDENT GROUPS—AT-RISK STUDENTS, ENGLISH LEARNERS & SPECIAL EDUCATION STUDENTS

In this section, Hanover presents resources and best practices for supporting three students groups: at-risk students, English learners, and special education students.

REPORT I: INTERVENTIONS FOR AT-RISK STUDENTS IN THE ELEMENTARY GRADES

INTRODUCTION

In this report, Hanover reviews best practices for providing academic supports to at-risk elementary students. Specific supports including scheduling, grouping, and out-of-school programs. This report intends to aid districts in providing all students with high-quality academic supports. Additional supports may include Response to Intervention (RTI) strategies, which teachers can find literacy- and math-specific instruction in the latter sections of this report.

SCHEDULING SUPPORTS

Schools should ensure that time dedicated to academic interventions does not conflict with the scheduling of core Tier 1 instruction to enable students in need of intervention to provide students with a comprehensive core curriculum.⁶⁴⁰ In this section, Hanover Research describes strategies to schedule academic supports and interventions. This section begins with a discussion of scheduling supports during the school day before reviewing the use of out-of-school time (OST) programs to provide interventions and enrichment.

SCHEDULING SUPPORTS DURING THE SCHOOL DAY

Schools should schedule intervention and enrichment periods for all students to ensure equitable access to interventions and supplemental supports.⁶⁴¹ Intervention and enrichment periods typically provide a daily block of 30-90 minutes with no core instruction scheduled, that can be used to support Tier 2 or Tier 3 interventions.⁶⁴² The consulting firm School Scheduling Associates identifies two primary approaches to scheduling intervention and enrichment periods using an RTI model, summarized in the following figure.

⁶⁴⁰ Stahl, K.A.D. "Response to Intervention." *Reading Teacher*, 69:6, May 2016. pp. 661–662. Retrieved from EBSCO Host

⁶⁴¹ "MTSS Quick Reference Guide: Scheduling within a Tiered System of Support - Elementary School." Massachusetts Department of Elementary and Secondary Education. p. 2. <http://www.doe.mass.edu/sfss/scheduling.pdf>

⁶⁴² Rettig, M.D. "Scheduling RTI and Special Services in Elementary Schools: No More 'When Can I Have Your Kids?'" School Scheduling Associates. p. 8. <http://www.schoolschedulingassociates.com/handouts/WCASS%20Elementary%20Slides.pdf>

Scheduling Approaches for Intervention and Enrichment Periods

| THE CENTERS APPROACH | THE RE-GROUPING APPROACH |
|--|--|
| <ul style="list-style-type: none"> Individual classroom teachers organize enrichment centers for Tier 1 students. Classroom teachers pull small groups from centers to provide some Tier 2 (moderate, short-term) interventions. Clinical specialists pull-out (or push-in) for other Tier 2 interventions. Tier 3 (intense, longer-term) interventions are provided as pull-outs or push-ins either in place of Tier 2 or in addition to Tier 2 as a second intervention. | <ul style="list-style-type: none"> Classes are re-grouped across a team or grade level to form tiered groups. Tier 1 students are provided enrichment by one more classroom teachers or other personnel (Gifted, encore, etc.). Tier 2 students are provided interventions by other classroom teachers or special service providers. Tier 3 students are provided interventions by clinical specialists either in place of Tier 2 or in addition to Tier 2 as a second pull-out. |

Source: School Scheduling Associates⁶⁴³

During an intervention and enrichment period, students identified as needing additional support in literacy or math receive data-driven interventions, while students performing on grade level participate in enrichment activities designed to support advanced levels of proficiency.⁶⁴⁴ The next figure compares intervention activities to enrichment activities.

Comparison of Intervention to Enrichment

| INTERVENTION | ENRICHMENT |
|--|---|
| <ul style="list-style-type: none"> Provide instruction for students who are struggling based upon identified (data-driven) needs Primarily focus on literacy and mathematics skills Are provided by a variety of qualified personnel, including classroom teachers and special educators, Title I educators, English language learner educators, etc. | <ul style="list-style-type: none"> Provides additional learning opportunities for students who demonstrate proficiency in the skills being taught in the classroom and are ready to go deeper into the content Focuses on moving proficient students to advanced proficiency Can be organized around enrichment units that integrate science, social studies, literacy and mathematics Provided by a variety of qualified personnel including classroom teachers, gifted/talented coordinators/ educators, 'specials' educators (such as art, music, physical education), paraprofessionals and other school personnel (such as librarian, technology educators) as well as community members |

Source: Massachusetts Department of Elementary and Secondary Education⁶⁴⁵

FLEXIBLE GROUPING

Teachers can use flexible grouping to provide students with targeted support during an instructional block. Research supports the use of flexible grouping during an instructional block to provide supports in both literacy and math. The Florida Center for Reading Research (FCRR) recommends that classroom teachers differentiate instruction by using formative assessment and observation data to flexibly group students for

⁶⁴³ Chart taken nearly verbatim with minor changes in wording from: Rettig, M.D. "Elementary School Scheduling: Enhancing Instruction for Student Achievement." School Scheduling Associates. p. 26.
<http://www.schoolschedulingassociates.com/handouts/Elementary6-13-11.pdf>

⁶⁴⁴ Ibid., p. 9.

⁶⁴⁵ Chart contents taken verbatim from: "MTSS Quick Reference Guide: Scheduling within a Tiered System of Support - Elementary School," Op. cit., p. 2.

classroom activities. Small groups for struggling readers in Grades K-3 should include one to four students, while students reading on grade level can learn in groups of five to eight students.⁶⁴⁶

School Scheduling Associates recommends that elementary schools use flexible grouping within a literacy block to differentiate instruction for students in Grades K-1. Schools can flexibly group students into homogeneous early literacy groups (ELGs) taught by classroom teachers and early literacy teams (ELTs) lead by a literacy coach. Students are assigned to ELGs based on formative assessment data and frequently regrouped based on ongoing assessment.⁶⁴⁷ In the scheduling model suggested by School Scheduling Associates, students participate in a morning and afternoon literacy block of approximately 90 minutes each.⁶⁴⁸ In general, the morning ELG block provides more teacher-directed instruction while the afternoon block incorporates more student participation, as shown in the following figure.⁶⁴⁹

ELG Activities

| INSTRUCTIONAL FOCUS | MORNING ELG BLOCK | AFTERNOON ELG BLOCK |
|------------------------------|--|---|
| Fluency | <ul style="list-style-type: none"> Modeled/Shared Reading Partner Reading | <ul style="list-style-type: none"> Repeated or Wide Reading Audio-taped Reading/Self-Evaluation/Performance Reading Fluency Assessment |
| Word Study | <ul style="list-style-type: none"> Word Bank Introduction Shared Picture/Word/Writing Sort Other Shared Word Study Activities | <ul style="list-style-type: none"> Word Bank Review Word Study Review Dictated Sentence Writing Word Study Assessment |
| Comprehension/Writing | <ul style="list-style-type: none"> Before Reading: New Book Introduction During Reading: Guided Reading, Prompting Documentation After Reading: Teaching Points, Oral Retelling, Discussion | <ul style="list-style-type: none"> Oral Retelling Practice Shared Writing Written Response/Comprehension Assessment |

Source: School Scheduling Associates⁶⁵⁰

School Scheduling Associates cites a Virginia elementary school as an example of the success of the ELG approach. This school implemented ELGs for Grades K-1 along with intervention and enrichment periods for Grades 3-5 beginning in 2008. By 2011, the percentage of Grade 3 students identified as needing reading interventions using the Phonological Awareness Literacy Screening (PALS) instrument declined from 24 percent to seven percent. At the same time, the percent of students obtaining proficient scores on state literacy assessments in Grade 3 increased from 79 percent to 93 percent.⁶⁵¹

USING OUT-OF-SCHOOL TIME TO SUPPORT STUDENT ACHIEVEMENT

Schools can also support student achievement through OST programs, including summer and after-school programs. These programs may be mandatory for students in need of remediation or voluntary enrichment programs. For example, several states require students who do not demonstrate reading proficiency by the end of Grade 3 to participate in summer reading camps.⁶⁵²

⁶⁴⁶ "How to Differentiate Instruction." Florida Center for Reading Research, Florida State University.
<http://www.fcrr.org/assessment/ET/diff/diff.html>

⁶⁴⁷ Canady, C.E. and R.L. Canady. "Literacy for All: Making It a Reality." School Scheduling Associates. pp. 2-4.
http://www.schoolschedulingassociates.com/wp-content/uploads/canady/Literacy_For_All_Ed_Leadership_Submission_final.pdf

⁶⁴⁸ For a complete sample schedule, see: Ibid., p. 8.

⁶⁴⁹ Ibid., p. 10.

⁶⁵⁰ Chart contents taken verbatim from: Ibid.

⁶⁵¹ Ibid., pp. 1-2.

⁶⁵² Smith, K.G. and B.R. Foorman. "Summer Reading Camp Self-Study Guide." Regional Educational Laboratory Southeast, February 2015. p. 2. https://eric.ed.gov/?q=summer+learning+elementary&ft=on&ff1=dySince_2015&pg=2&id=ED554311

Ceres USD in California combines a mandatory Academic Intervention Program (AIP) with voluntary afterschool enrichment programs, as shown in the figure below. Ceres USD assigns students to the mandatory AIP program based on multiple assessments of academic progress administered during the first three months of the school year.⁶⁵³

Ceres USD OST Supports for Elementary Students

| PROGRAM | DESCRIPTION |
|--------------------------------------|--|
| Academic Intervention Program | Students attend this program for 1 hour after school on Tuesdays, Wednesdays, and Thursdays. Students receive 15 minutes of homework help, then work on specific skills in Language Arts and Math. Lessons utilized parallel the regular school day curriculum. Approximately 65 days per year are provided, with exceptions on minimum days and holidays. |
| Enrichment Activities | Enrichment activities are provided to students not mandated to attend the AIP portion of the after-school program. These activities reinforce Language Arts and math skills through fun and interesting activities and games specifically designed by the same publishers of the regular school day curriculum. |
| Summer School | Elementary Summer School is offered in the month of June during the regular summer break. During the month of June, students will receive four weeks of reinforced learning of Language Arts and math from the grade level just completed. |

Source: Ceres Unified School District⁶⁵⁴

Research finds positive effects of OST programs, including afterschool programs and summer learning, on student achievement. In the remainder of this section, Hanover Research reviews research on outcomes and best practices for both summer and afterschool OST programs.

SUMMER LEARNING PROGRAMS

Research on both formal and informal summer learning programs finds positive effects on student achievement. A 2016 study examines the impact of the Reading Enhances Achievement During Summer (READS) summer reading program on a random sample of 5,569 students during the summer between Grades 2 and 3.⁶⁵⁵ The READS intervention includes a comprehension lesson towards the end of the school year, and students receive books matched to their personal interests and reading levels throughout the summer.⁶⁵⁶ The 2016 study finds that students who participated in READS earned significantly higher scores than students in a control group on the comprehension component of Grade 3 state ELA assessments. Notably, these assessments were administered nine months after the end of the intervention, suggesting a long-term impact of summer reading on literacy achievement.⁶⁵⁷

A 2014 [meta-analysis](#) conducted by the Institute of Education Sciences and the American Institutes for Research examined over 30 research studies with high-quality designs and found some with positive results and others with mixed results, suggesting “that no single increased learning time program fits the needs of all students.”⁶⁵⁸ Main takeaways from the study include:⁶⁵⁹

⁶⁵³ “Academic Intervention Program (AIP) - Elementary.” Ceres Unified School District.

https://www.ceres.k12.ca.us/student_support/educational_options/after_school_programs_summary_information/academic_intervention_program__a_i_p_-_elementar

⁶⁵⁴ Chart contents taken verbatim from: Ibid.

⁶⁵⁵ Kim, J.S. et al. “Delayed Effects of a Low-Cost and Large-Scale Summer Reading Intervention on Elementary School Children’s Reading Comprehension.” *Journal of Research on Educational Effectiveness*, 9, October 2, 2016. p. 6. Retrieved from EBSCO Host

⁶⁵⁶ Ibid., p. 2.

⁶⁵⁷ Ibid., pp. 8, 14.

⁶⁵⁸ Kidron, Y and Lindsay, J. “The effects of increased learning time on student academic and nonacademic outcomes: Findings from a meta-analytic review.” Institute of Education Sciences, 2014, p. i.

https://ies.ed.gov/ncee/edlabs/regions/appalachia/pdf/REL_2014015.pdf

⁶⁵⁹ Reproduced verbatim from Ibid. pp. 4-15.

- Across all student subgroups, increased learning time programs had a positive effect on students' academic motivation but not on literacy or math achievement.
- Certified teachers and traditional instruction each had a positive effect on students' academic outcomes; experiential instruction had a positive effect on social-emotional skill development.
- Increased learning time had a positive effect on students performing below standards.
- Increased learning time can be effective in urban, suburban, and mixed locales.
- Increased learning time programs had a positive effect on the academic achievement of elementary school students but a negative effect on the literacy achievement of middle school students.

BEST PRACTICES FOR SUMMER LEARNING PROGRAMS

Effective summer learning programs provide structured learning opportunities aligned with state and district learning standards. The district may use curriculum standards and self-developed standards, where appropriate. The National Summer Learning Association (NSLA) describes how organizers of summer programming should establish program standards that “[provide] structure and clear expectations” for program staff and participants.⁶⁶⁰ The NSLA describes how effective programs outline clear behavioral expectations for program participants and learning outcomes that can be measured following the conclusion of the program.⁶⁶¹

The Wallace Foundation adds that districts should consider how to integrate curriculum standards into summer programming, particularly programs that teach academic content. The programs should engage students in active learning and provide opportunities for out-of-classroom learning. Program activities should be hands-on, with opportunities for real-world application and physical activity. The following figure lists the Wallace Foundation's recommendations for summer program activities.

Recommendations for Summer Learning Programs

- **Make learning fun.** Successful summer learning programs supplement academic instruction with enrichment activities that are relevant and engaging to children and youth. Some examples include a debate on current events, use of technology, field trips, hip-hop dance, rap and spoken word, improvisational comedy, art, drama, and storytelling. They also include time for sports and recreational activities to offer students a chance to participate in the physical activities they enjoy.
- **Ground learning in a real-world context.** Consistent with an accelerated learning approach, academic concepts are best learned when applying them in a real-world context, for example, by teaching students about the difference between deciduous and coniferous trees by taking them on a hike through the forest.
- **Integrate hands-on activities.** Didactic lectures may increase knowledge but are not very effective at changing behavior. Interactive forms of instruction, such as immersion and experiential learning, help to keep students engaged in the material. Engaging children in games, group projects, field trips to historic sites, nature expeditions, and science experiments are all ways in which to make learning more interesting and applied.
- **Content should complement curricular standards.** Successful educational programs integrate learning activities that complement what children are learning during the school year. Therefore, academic content is aligned with statewide, grade-level curricular standards for English Language Arts and Mathematics.

Source: The Wallace Foundation⁶⁶²

⁶⁶⁰ “Best Practices in Summer Learning Programs for Middle and High School Youth.” The National Summer Learning Association. p. 12. http://www.smartersummers.org/bestpractices/NSLA_BestPractices2012-Stream.pdf

⁶⁶¹ Ibid., pp. 12–17.

⁶⁶² Terzian, M., K.A. Moore, and K. Hamilton. “Effective and Promising Summer Learning Programs and Approaches for Economically Disadvantaged Children and Youth.” The Wallace Foundation, July 2009. p. 17. <http://www.wallacefoundation.org/knowledge-center/documents/effective-and-promising-summer-learning-programs.pdf>

AFTERSCHOOL PROGRAMS

Research also finds positive impacts of effective afterschool programs on student achievement. A longitudinal study of an enrichment-focused afterschool program for elementary school students living in low-income, high-crime neighborhoods of Los Angeles, California finds that participation in the program significantly increases students' likeliness of graduating from high school.⁶⁶³ A comprehensive review of the literature on afterschool programs published in 2019 identifies 60 specific afterschool programs that meet the evidence criteria established by the Every Student Succeeds Act (ESSA) for positive effects on student outcomes.⁶⁶⁴ This review finds that the average effect size of afterschool programs on school engagement and attendance is stronger than that on reading and math achievement, but that the effects of afterschool programs on reading and math achievement are statistically significant across studies.⁶⁶⁵

BEST PRACTICES FOR AFTERSCHOOL PROGRAMS

The 2016 literature review recommends that academic enrichment programs adopt the best practices listed in the figure below. Several of these practices align the academic content of afterschool programs with the core curriculum taught during the school day. These practices also include strategies to engage students and support social-emotional development.⁶⁶⁶

Best Practices for Afterschool Enrichment Programs

- | | |
|--|--|
| ▪ Clearly communicate program goals | ▪ Promote collaboration among students |
| ▪ Meet local needs | ▪ Provide students with individualized attention |
| ▪ Complement school-day learning | ▪ Create a flexible environment |
| ▪ Communicate with school-day instructional staff | ▪ Create a supportive setting |
| ▪ Provide a combination of academic, enrichment, and recreational activities | ▪ Hire and retain quality staff |
| ▪ Provide homework support | ▪ Involve families |
| ▪ Include hands-on activities | ▪ Involve community partners |
| ▪ Link activities to students' lives | ▪ Evaluate programs |
| ▪ Integrate technology into activities | |

Source: Research Services, Miami-Dade County Public Schools⁶⁶⁷

⁶⁶³ La Torre, D. et al. "Long-Term Outcome Study: A Longitudinal Study of LA's BEST Students' Persistence and Graduation Rates." National Center for Research on Evaluation, Standards, and Student Testing, January 2019. pp. 5, 23. <https://eric.ed.gov/?q=afterschool+elementary&ft=on&id=ED594613>

⁶⁶⁴ Neild, R.C., S.J. Wilson, and W. McClanahan. "Afterschool Programs: A Review of Evidence under the Every Student Succeeds Act." Research for Action, 2019. p. ii. https://eric.ed.gov/?q=afterschool+elementary&ft=on&ff1=dytSince_2015&id=ED593600 For a full list of evidence-based programs, see pp. 41-45

⁶⁶⁵ Ibid., p. 29.

⁶⁶⁶ Blazer, C. "After-School Academic Enrichment Programs." Research Services, Miami-Dade County Public Schools, June 2016. pp. 3-5. https://eric.ed.gov/?q=afterschool+elementary&ft=on&ff1=dytSince_2015&pg=2&id=ED570131

⁶⁶⁷ Chart contents taken verbatim from: Ibid.

REPORT II: SUPPORTING ENGLISH LEARNERS IN THE GENERAL EDUCATION CLASSROOM

INTRODUCTION

English learners (ELs) are the most rapidly growing subgroup of students in U.S. public schools—in the last decade, the number of ELs in public schools increased by approximately 60 percent.⁶⁶⁸ However, ELs experience worse academic outcomes than their English-speaking peers, including lower reading and math scores, fewer advanced courses, and lower graduation rates.⁶⁶⁹ Therefore, ELs require targeted instructional strategies that meet their unique needs.

In this report, Hanover synthesizes the literature on best practices for supporting ELs in the general education classroom. The report discusses instructional practices for developing ELs' English literacy skills and content acquisition, as well as strategies for supporting ELs' non-academic success through social-emotional learning and incorporating ELs' home culture into the classroom setting and instruction.

INSTRUCTIONAL STRATEGIES FOR SUPPORTING ELs IN GENERAL EDUCATION

The following section presents research-based instructional strategies for teaching ELs in the general education classroom.

SUPPORTING ENGLISH LANGUAGE AND LITERACY SKILLS

Research shows that while general best practices in instruction are effective for ELs, they require additional instructional support to develop English language proficiency.⁶⁷⁰ Although discussions of instructional strategies for ELs tend to focus on the relative use of English and students' first language, "the quality of instruction also matters a great deal."⁶⁷¹ The National Literacy Panel on Language-Minority Children and Youth finds that instruction that emphasizes the key elements of reading, including phonemic awareness, phonics, fluency, vocabulary, and text comprehension, supports literacy achievement for ELs.⁶⁷² The following best practices also support the development of ELs' literacy skills in both English-only and dual language instructional models:⁶⁷³

- A focus on oral language development, such as opportunities to practice English in the classroom, building on students' background knowledge
- Cooperative learning
- Explicit instruction in the elements of English literacy
- Differentiated instruction
- The use of graphic organizers as a comprehension strategy
- A focus on academic language

⁶⁶⁸ Hansen, M. and D. Quintero. "English Learners and the Growing Need for Qualified Teachers." Brookings Institution, June 2, 2017. <https://www.brookings.edu/blog/brown-center-chalkboard/2017/06/02/english-learners-and-the-growing-need-for-qualified-teachers/>

⁶⁶⁹ Ibid.

⁶⁷⁰ Goldenberg, C. "Unlocking the Research on English Learners: What We Know - and Don't Yet Know - about Effective Instruction." *American Educator*, Summer 2013. p. 4. https://www.aft.org/sites/default/files/periodicals/English_Learners.pdf

⁶⁷¹ Moughamian, A.C., M.O. Rivera, and D.J. Francis. "Instructional Models and Strategies for Teaching English Language Learners." Center on Instruction, 2009. p. 3. <http://eric.ed.gov/?id=ED517794>

⁶⁷² "Developing Literacy in Second-Language Learners: Report of the National Literacy Panel on Language-Minority Children and Youth. Executive Summary." Center for Applied Linguistics, 2006. p. 3. Downloaded from: <http://www.cal.org/resource-center/publications/developing-literacy>

⁶⁷³ Bulleted text taken verbatim from: Moughamian, Rivera, and Francis, Op. cit., p. 22.

Teachers should also target multiple domains of vocabulary – Tier 1, Tier 2, and Tier 3 words – when instructing ELs.⁶⁷⁴ Tier 1 words are conceptual, simple, and frequently used words (e.g., butterfly, uncle), and ELs may understand the definitional idea in their primary language. Some Tier 1 words possess multiple meanings (e.g., fly), so teachers should tailor instruction accordingly. Teachers can use direct instruction for Tier 1 words.⁶⁷⁵ Tier 2 words are more abstract terms that students must know to understand a text or discussion (e.g., character, tables, calculate), and have “high instructional potential.” Teachers should encourage students to talk about, use, analyze, and compare Tier 2 words to promote understanding.⁶⁷⁶ Tier 3 words (e.g., amoeba, isotope), which are found mostly in specialized curricular materials, appear with limited frequency. Teachers should explain these words as students encounter them or through pre-teaching.⁶⁷⁷

Additionally, teachers can use the questions in the figure below during a team meeting or professional learning community, for example, to generate discussion and innovation about ELs’ language growth.

Language Growth Discussion Questions

- What data and resources are available to determine students’ academic language development?
- What are EL students’ strengths?
- What are our staff’s strengths working with ELs? How are we currently collaborating?
- How do we value change?
- Do we measure growth? If so, how?
- Do we build in time for reflection about growth?
- What do we do with our data on growth?
- What does our data say about growth in our classrooms?
- What would help us to better understand how our students grow?
- How do we share our knowledge on student growth with other educators?
- What are some indicators of success for us?
- How do these indicators of success support student growth for the better?
- Do we have plans in place to get where we want to go? If so, what are they?
- How will we know we are successful?
- How will we know when our students have met their language goals?

Source: WIDA⁶⁷⁸

TEACHING ENGLISH THROUGH ACADEMIC CONTENT

Experts recommend teaching written and oral English language skills through academic content area instruction. In its 2014 practice guide, the U.S. Department of Education’s Institute of Education Sciences (IES) found five studies that meet its strict evidence standards and show positive results on language and content area acquisition from integrating English language development into content area instruction.⁶⁷⁹

Evidence-based strategies emphasize

⁶⁷⁴ [1] “Selecting Vocabulary Words to Teach English Language Learners.” Colorín Colorado. <http://www.colorincolorado.org/article/selecting-vocabulary-words-teach-english-language-learners> [2] Wong, C. “Effective Instruction for English Learners.” Sonoma County Office of Education, October 2006. p. 4. https://www.scoe.org/docs/ah/AH_calderon.pdf

⁶⁷⁵ Wong, Op. cit., p. 4.

⁶⁷⁶ Ibid.

⁶⁷⁷ “Selecting Vocabulary Words to Teach English Language Learners,” Op. cit.

⁶⁷⁸ Figure adapted from: “WIDA Focus on Language Growth.” WIDA Consortium, 2013. p. 8. <https://www.maine.gov/doe/access/documents/WIDA-focus-on-language-growth.pdf>

⁶⁷⁹ Baker, S. et al. “Teaching Academic Content and Literacy to English Learners in Elementary and Middle School.” U.S. Department of Education, Institute of Education Sciences, 2014. p. 31. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/english_learners_pg_040114.pdf

providing ELs with opportunities to develop their oral language skills during content-area instruction, with primary-language support when needed.⁶⁸⁰ Additionally, ELs benefit from designated time for oral language development.⁶⁸¹ Specifically, the IES recommends the following practices to build ELs' language skills through the learning of academic content:⁶⁸²

- Strategically use instructional tools—such as short videos, visuals, and graphic organizers—to anchor instruction and help students make sense of content
- Explicitly teach the content-specific academic vocabulary, as well as the general academic vocabulary that supports it, during content-area instruction
- Provide daily opportunities for students to talk about content in pairs or small groups
- Provide writing opportunities to extend student learning and understanding of the content material

Furthermore, the Center for Applied Linguistics provides [this resource](#) with strategies for implementing the Common Core State Standards for ELs.⁶⁸³

USE OF STUDENTS' FIRST LANGUAGE

Teachers in both English-only and dual language instructional models can use students' first language to support the development of literacy skills in English. A 2013 *American Educator* review of research on dual language and English-only instruction notes that teachers can provide strategic instructional supports based on students' first language, even when all academic content is taught in English, as is the case in general education and sheltered instruction classes.⁶⁸⁴ In particular, this review recommends the following strategies to support ELs using their first language:⁶⁸⁵

- Drawing attention to cognate words
- Providing brief explanations in students' first language, rather than concurrent translation
- Previewing and reviewing lesson content in students' first language
- Teaching literacy strategies in students' first language and then applying these strategies to English

Research suggests that literacy skills can transfer from a student's first language to English, making first language support especially beneficial for ELs. Teachers should recognize students' first language literacy skills and help these students make connections between their first language and English.⁶⁸⁶ Similarly, the 2006 National Literacy Panel on Language-Minority Children and Youth report finds that cognate instruction may be a particularly effective strategy to support ELs. In particular, this report finds strong evidence that students can use cognate relationships to understand individual English words, and more limited evidence that understanding cognate relationships supports overall reading comprehension.⁶⁸⁷

⁶⁸⁰ Richards-Tutor, C., T. Aceves, and L. Reese. "Evidence-Based Practices for English Learners." Collaboration for Effective Educator, Development, Accountability, and Reform, November 2016. p. 7. <http://cedar.education.ufl.edu/wp-content/uploads/2016/11/EBP-for-english-learners.pdf>

⁶⁸¹ Ibid., p. 9.

⁶⁸² Bullet points quoted verbatim from: Baker et al., Op. cit., pp. 32–42.

⁶⁸³ Duguay, A. et al. "Implementing the Common Core for English Learners." Center for Applied Linguistics, September 2013. <http://www.cal.org/siop/pdfs/briefs/implementing-common-core-for-english-learners.pdf>

⁶⁸⁴ Bulleted text adapted from: Goldenberg, "Unlocking the Research on English Learners: What We Know - and Don't Yet Know - about Effective Instruction," Op. cit., p. 10.

⁶⁸⁵ Bulleted text adapted from: Ibid.

⁶⁸⁶ Richards-Tutor, Aceves, and Reese, Op. cit., p. 15.

⁶⁸⁷ "Developing Literacy in Second-Language Learners," Op. cit., p. 5.

ACADEMIC LANGUAGE DEVELOPMENT

Educators should support the development of ELs' academic language skills, as these skills may take longer to develop than conversational English skills.⁶⁸⁸ To ensure that instruction focuses on academic language, teachers can develop language objectives, which specify the academic language that students need to apply in order to master content objectives of a lesson.⁶⁸⁹ Notably, creating language objectives is critical to implementing sheltered instruction, which Hanover further discusses in the following subsection. The Center for Applied Linguistics (CAL) recommends that teachers explicitly teach, refer to, and assess language objective during the lesson.⁶⁹⁰

Support for academic language development may be particularly important for ELs in the secondary grades, as secondary ELs experience increasingly challenging content and new texts, while simultaneously receiving less dedicated language instruction than in elementary school.⁶⁹¹ Indeed, many programs at this level pinpoint reading and textual comprehension in an academic setting. These considerations aim to prepare middle and high school EL students for success in higher education, where oral and listening English proficiency may no longer be enough for academic achievement. Reading, writing, and analyzing text, which relies on an understanding of academic vocabulary, are critical skills that EL students need to develop as they graduate into middle and high school.⁶⁹²

The U.S. Department of Education also recommends teaching academic language to ELs to support their content-area and overall literacy. In 2014, the IES published a practice guide that synthesizes the extant research on instruction for EL students and compiles a set of recommended practices based on the literature and the expertise of the authors. The guide's recommended practices, shown in the figure below, are for both elementary and middle school students and address a range of considerations across various instructional areas.

Recommendations for Supporting Content-Area Literacy in ELs

| RECOMMENDATION | SUGGESTIONS FOR IMPLEMENTATION |
|--|--|
| Teach a set of academic vocabulary words intensively across several days using a variety of instructional activities | <ul style="list-style-type: none"> Choose a brief, engaging piece of informational text that includes academic vocabulary as a platform for intensive academic vocabulary instruction. Choose a small set of academic vocabulary for in-depth instruction. Teach academic vocabulary in depth using multiple modalities (writing, speaking, listening). Teach word-learning strategies to help students independently figure out the meaning of words. |

⁶⁸⁸ August, D., J. Estrada, and A. Boyle. "Supporting English Language Learners A Pocket Guide for State and District Leaders." American Institutes for Research. p. 6. http://www.air.org/sites/default/files/downloads/report/ELL_Pocket_Guide1_0.pdf

⁶⁸⁹ Himmel, J. "Language Objectives: The Key to Effective Content Area Instruction for English Learners." Colorín Colorado. <http://www.colorincolorado.org/article/language-objectives-key-effective-content-area-instruction-english-learners>

⁶⁹⁰ Markos, A. and J. Himmel. "Using Sheltered Instruction to Support English Learners." Center for Applied Linguistics, March 2016. pp. 4, 6. <http://www.cal.org/resource-center/briefs-digests/briefs>

⁶⁹¹ [1] Menken, K. "Emergent Bilingual Students in Secondary School: Along the Academic Language and Literacy Continuum." *Language Teaching*, 46:04, October 2013. p. 441. <https://katemenken.files.wordpress.com/2011/10/menken-2013-language-teaching.pdf> [2] Hwang, J.K. et al. "Differential Effects of a Systematic Vocabulary Intervention on Adolescent Language Minority Students with Varying Levels of English Proficiency." *International Journal of Bilingualism*, 19:3, 2015. Accessed via ProQuest. [3] Matunchniak, T., C.B. Olsen, and R. Scarcella. "Examining the Text-Based, On-Demand, Analytical Writing of Mainstreamed Latino English Learners in a Randomized Field Trial of the Pathway Project Intervention." *Reading and Writing*, 27:6, November 2013. Accessed via ProQuest. [4] Lesaux, N.K. et al. "The Effectiveness and Ease of Implementation of an Academic Vocabulary Intervention for Linguistically Diverse Students in Urban Middle Schools." *Reading Research Quarterly*, 45:2, 2010. Accessed via ProQuest. [5] Vaughn, S. et al. "Enhancing Social Studies Vocabulary and Comprehension for Seventh-Grade English Language Learners: Findings from Two Experimental Studies." *Journal of Research on Educational Effectiveness*, 2, October 2009. Accessed via EBCSOHost.

⁶⁹² Cisco, B.K. and Y. Padron. "Investigating Vocabulary and Reading Strategies with Middle Grades English Language Learners: A Research Synthesis." *Research in Middle Level Education*, 36:4, 2012. p.1. https://www.amle.org/portals/0/pdf/rmle/rmle_vol36_no4.pdf

| RECOMMENDATION | SUGGESTIONS FOR IMPLEMENTATION |
|--|--|
| Integrate oral and written English language instruction into content-area teaching. | <ul style="list-style-type: none"> Strategically use instructional tools—such as short videos, visuals, and graphic organizers—to anchor instruction and help students make sense of content. Explicitly teach the content-specific academic vocabulary, as well as the general academic vocabulary that supports it, during content-area instruction. Provide daily opportunities for students to talk about content in pairs or small groups. Provide writing opportunities to extend student learning and understanding of the content material. |
| Provide regular, structured opportunities to develop written language skills. | <ul style="list-style-type: none"> Provide writing assignments that are anchored in content and focused on developing academic language as well as writing skills. For all writing assignments, provide language-based supports to facilitate students' entry into, and continued development of, writing. Use small groups or pairs to provide opportunities for students to work and talk together on varied aspects of writing. Assess students' writing periodically to identify instructional needs and provide positive, constructive feedback in response. |
| Provide small-group instructional intervention to students struggling in areas of literacy and English language development. | <ul style="list-style-type: none"> Use available assessment information to identify students who demonstrate persistent struggles with aspects of language and literacy development. Design the content of small-group instruction to target students' identified needs. Provide additional instruction in small groups consisting of three to five students to students struggling with language and literacy. For students who struggle with basic foundational reading skills, spend time not only on these skills but also on vocabulary development and listening and reading comprehension strategies. |

Source: Institute of Education Sciences⁶⁹³

SUPPORTING CONTENT ACQUISITION

Teachers may wish to **modify instructional activities to increase accessibility and provide additional language support for ELs to facilitate content acquisition**. Additionally, teachers should teach explicit comprehension strategies.⁶⁹⁴ For example, research suggests that instructional scaffolds such as graphic representations and building background knowledge can improve learning outcomes for ELs.⁶⁹⁵

SHELTERED INSTRUCTION OBSERVATION PROTOCOL MODEL

Furthermore, teachers can use **the Sheltered Instruction Observation Protocol (SIOP) model**, a research-based pedagogy for teaching academic content and English language skills to ELs that blends sheltered instruction techniques with academic English reading, writing, listening, and speaking, and helps content teachers promote oral language development more systematically.⁶⁹⁶ The figure below presents the SIOP Model's eight components and relevant strategies for successful implementation.

⁶⁹³ Figure contents quoted verbatim from: Baker et al., *Op. cit.*, p. 6.

⁶⁹⁴ Richards-Tutor, Aceves, and Reese, *Op. cit.*, p. 11.

⁶⁹⁵ Goldenberg, "Unlocking the Research on English Learners: What We Know - and Don't Yet Know - about Effective Instruction," *Op. cit.*, p. 8.

⁶⁹⁶ [1] "Instructional Models and Strategies for Teaching English Language Learners." Center on Instruction at the University of Texas at Austin, 2009. p. 22. <http://files.eric.ed.gov/fulltext/ED517794.pdf> [2] Zehr, M.A. "Oral-Language Skills for English-Learners Focus of Researchers." *Education Week*, October 19, 2009. <http://www.edweek.org/ew/articles/2009/10/21/08ell.h29.html?r=1420658504&preview=1>

SIOP's Eight Components

| SIOP COMPONENTS AND STRATEGIES | DESCRIPTIONS |
|---------------------------------|--|
| Lesson Preparation | <ul style="list-style-type: none"> Clearly define content and language objectives. Select content concepts that are appropriate to learners' age and educational background. Use supplementary materials to make the lesson clear and meaningful (e.g., graphs, models, visuals). Adapt the content to all proficiency levels. Use authentic and meaningful activities and integrate them into lesson concepts. |
| Building Background | <ul style="list-style-type: none"> Explicitly link concepts to students' background experiences. Explicitly link past learning to new content. Emphasize key vocabulary. |
| Comprehensible Input | <ul style="list-style-type: none"> Use speech that is appropriate for students' proficiency level. Clearly explain academic tasks. Use a variety of techniques to make content clear (e.g., model, use visuals, demonstrations). |
| Learning Strategies | <ul style="list-style-type: none"> Provide ample opportunities for students to use strategies. Consistently use scaffolding techniques throughout the lesson. Include a variety of question types that promote higher-order thinking skills. |
| Interaction | <ul style="list-style-type: none"> Provide students with frequent opportunities for interaction and discussion. Carefully configure the grouping of students to support language and content of the lesson. Consistently provide sufficient wait time for student responses. Provide ample opportunities for students to clarify key concepts in their native language. |
| Practice and Application | <ul style="list-style-type: none"> Provide hands-on materials and manipulatives for students to practice using new content knowledge. Provide activities for students to apply content and language knowledge in the classroom. Use activities that integrate all language skills (i.e., reading, writing, listening, and speaking). |
| Lesson Delivery | <ul style="list-style-type: none"> Clearly support the content and language objectives in lesson delivery. Engage students 90 percent to 100 percent of the time. Pace the lesson appropriately to students' ability level. |
| Review and Assessment | <ul style="list-style-type: none"> Include a comprehensive review of key vocabulary and concepts. Provide regular feedback to students on their output. Assess student comprehension and learning for all objectives throughout a lesson. |

Source: CAL and Teaching Tolerance⁶⁹⁷

The SIOP model's popularity has increased in recent years, with some experts considering it as the most effective approach that is not primarily designed for bilingual or English-only programs. For instance, one 2007 study of California middle school science teachers found that a higher implementation of SIOP strategies had a positive correlation with EL student performance on both English proficiency and science tests.⁶⁹⁸ Another study found that ELs in classes with teachers who received training under the SIOP model performed better than students in control classes.⁶⁹⁹

⁶⁹⁷ Figure text reproduced verbatim and adapted from: [1] Ibid. [2] Varela, E. "Whose Student Is She?" Teaching Tolerance, January 11, 2010. <https://www.tolerance.org/magazine/spring-2010/whose-student-is-she>

⁶⁹⁸ Zehr, Op. cit.

⁶⁹⁹ [1] Goldenberg, C. "Teaching English Language Learners: What the Research Does—and Does Not—Say." American Educator, 2008. p. p.20. <http://www.aft.org/sites/default/files/periodicals/goldenberg.pdf> [2] Wallace, S. "Effective Instructional Strategies for English Language Learners in Mainstream Classrooms." John Hopkins School of Education.

STRATEGIES FOR IMPLEMENTING SHELTERED INSTRUCTION

During lesson preparation, teachers using the SIOP model should define clear and attainable content and language objectives.⁷⁰⁰ Content objectives, which often stem from state standards, “state the cognitive skills or knowledge that students are expected to acquire during a lesson and specify how students will demonstrate what they have learned.”⁷⁰¹ Alternatively, language objectives “articulate for learners the academic language functions and skills they need to master to fully participate in the lesson and meet the grade-level content standards.”⁷⁰² When drafting content and language objectives, teachers should consider key vocabulary and concepts, instructional tasks, and curricular standards. Clearly posting objectives helps students identify what they will learn and do in each lesson.⁷⁰³ The following figure displays a sample Grade 7 content standard from the Next Generation Science Standards (NGSS) and a corresponding language objective, while subsequent figures—“Example Verbs for Content Objectives Based on Bloom’s Taxonomy” and “Example Verbs for Language Objectives Based on Language Domains”—outline actionable verbs that teachers can use to write content and language objectives.

Sample Content and Language Objectives

| CONTENT OBJECTIVE | LANGUAGE OBJECTIVE |
|---|---|
| Students will analyze how parts of a cell function in normal cells and cancerous cells to demonstrate knowledge of parts of a cell. | Students will be able to summarize in writing the differences and similarities between normal and cancer cells using the following key words and phrases: unlike, in contrast to, the same as, similarly, cytoplasm, nucleus/nuclei, nucleolus/nucleoli, and chromatin. |

Source: Center for Applied Linguistics⁷⁰⁴

Example Verbs for Content Objectives Based on Bloom’s Taxonomy

| Knowledge | Comprehension | Application | Synthesis | Evaluation |
|---|--|---|--|--|
| <ul style="list-style-type: none"> •List •Identify •Locate •Label •Describe •Define | <ul style="list-style-type: none"> •Recall •Summarize •Explain •Demonstrate •Translate •Rephrase | <ul style="list-style-type: none"> •Predict •Compare •Contrast •Solve •Classify •Categorize | <ul style="list-style-type: none"> •Combine •Compile •Compose •Construct •Design •Invent | <ul style="list-style-type: none"> •Choose •Decide •Recommend •Select •Justify •Defend |

Source: Shoreline Public Schools (Washington)⁷⁰⁵

<http://archive.education.jhu.edu/PD/newhorizons/strategies/topics/English%20Language%20Learners/Articles/Effective%20Instructional%20Strategies%20for%20English%20Language%20Learners%20in%20Mainstream%20Classrooms/index.html>

⁷⁰⁰ “Sheltered Instruction Observation Protocol (SIOP).” Teaching Tolerance. <http://www.tolerance.org/supplement/sheltered-instruction-observation-protocol-siop>

⁷⁰¹ Markos, A. and J. Himmel. “Using Sheltered Instruction to Support English Learners.” Center for Applied Linguistics, March 2016. p. 3. <http://www.cal.org/content/download/3511/43439/file/using-sheltered-instruction-to-support-english-learners.pdf>

⁷⁰² Ibid., p. 4.

⁷⁰³ Himmel, J. “Language Objectives: The Key to Effective Content Area Instruction for English Learners.” Colorín Colorado. <http://www.colorincolorado.org/article/language-objectives-key-effective-content-area-instruction-english-learners>

⁷⁰⁴ Figure contents quoted verbatim from: Markos and Himmel, “Using Sheltered Instruction to Support English Learners,” Op. cit., pp. 3–3.

⁷⁰⁵ Figure adapted from: “Writing and Using Content and Language Objectives.” Shoreline Public Schools. p. 3. <http://schools.shorelineschools.org/swstaff/files/2014/08/writing-content-and-language-objectives.pdf>

Example Verbs for Language Objectives Based on Language Domains

| Listening | Speaking | Reading | Writing | Vocabulary |
|---|--|--|---|---|
| <ul style="list-style-type: none"> •Tell •Roleplay •Identify •Recognize •Show •Heed | <ul style="list-style-type: none"> •Rephrase •Ask •Answer •Pronounce •Respond •Explain | <ul style="list-style-type: none"> •Preview •Read •Find •Identify •Skim •Explore | <ul style="list-style-type: none"> •List •Summarize •Create •Justify •Write •Contrast | <ul style="list-style-type: none"> •Define •Find •Construct •Categorize •Explain •Use |

Source: Shoreline Public Schools (Washington)⁷⁰⁶

Before beginning the lesson, teachers can support student success by identifying students' prior knowledge of the lesson content and building on students' background knowledge. Strategies that can help instructional staff establish background knowledge include using pictures, manipulatives, or personal experience to introduce a topic; relating material to students' lives; priming students with information before reading; explaining key vocabulary; and establishing a lesson's purpose.⁷⁰⁷ These strategies also increase comprehensible input as teachers provide students with multiple introductions to content and relevant context to explain academic tasks.⁷⁰⁸

During the lesson, teachers should use specific learning strategies and offer students opportunities to interact with peers, practice learned skills, and apply new knowledge during a lesson.⁷⁰⁹ Instructors can incorporate impactful tasks such as writing and peer review to achieve content and language objectives.⁷¹⁰ ELs may receive explicit instruction on cognitive and metacognitive strategies that teachers can stimulate by asking questions addressing multiple areas of thinking.⁷¹¹ Pairing or grouping students further develops content knowledge, advances ELs' English-speaking skills, and establishes peer connections.⁷¹²

Additionally, when delivering a lesson, teachers should ensure that all instructional tasks support students' attainment of content and language objectives.⁷¹³ ELs also benefit when educators speak clearly at a pace students can understand and are conscientious of language usage by avoiding slang phrases and idioms that ELs may not understand. Positive classroom environments are conducive to students asking for clarification on unfamiliar words and have tools (e.g., word walls) to help determine words' meanings.⁷¹⁴ Teachers should continuously provide feedback to students through formative assessments and reviews.⁷¹⁵

⁷⁰⁶ Figure adapted from: Ibid.

⁷⁰⁷ "How to Develop a Lesson Plan That Includes ELLs." Colorín Colorado. <http://www.colorincolorado.org/article/how-develop-lesson-plan-includes-ells>

⁷⁰⁸ Li, N. "Seeking Best Practices and Meeting the Needs of the English Language Learners: Using Second Language Theories and Integrating Technology in Teaching." *Journal of International Education Research*, 9:3, 2013. p. 218. <https://clutejournals.com/index.php/JIER/article/download/7878/7937>

⁷⁰⁹ Kareva, V. and J. Echevarria. "Using the SIOP Model for Effective Content Teaching with Second and Foreign Language Learners." *Journal of Education and Training Studies*, 1:2, August 6, 2013. pp. 241–242. <http://redfame.com/journal/index.php/jets/article/view/173>

⁷¹⁰ "How to Develop a Lesson Plan That Includes ELLs," Op. cit.

⁷¹¹ Kareva and Echevarria, Op. cit., pp. 241–242.

⁷¹² Li, Op. cit., p. 219.

⁷¹³ Kareva and Echevarria, Op. cit., p. 242.

⁷¹⁴ Robertson, K. "Supporting ELLs in the Mainstream Classroom: Language Tips." Colorín Colorado. <http://www.colorincolorado.org/article/supporting-ells-mainstream-classroom-language-tips>

⁷¹⁵ Sherris, A. "Integrated Content and Language Instruction." Center for Applied Linguistics, 2008. pp. 3–4. <http://www.cal.org/siop/pdfs/digests/integrated-contentand-language-instruction.pdf>

STRATEGIES FOR TEACHING MATH

ELs often require additional supports and explicit instruction in math due to the challenges with the language used in math courses.⁷¹⁶ Although math uses numbers and symbols, academic language plays a key role in mathematics instruction. In fact, the Center on Instruction (COI) notes that “much of the delivery of the mathematics curriculum is via text characterized by academic language.”⁷¹⁷ Further, many conventional and conversational English words have different meanings in mathematical contexts.⁷¹⁸ Thus, ELs may experience difficulty with math vocabulary, including instructions for math problems, in general, and word problems, in particular.⁷¹⁹ To this end, the COI highlights three main considerations, including:⁷²⁰

- ELs need early, explicit, and intensive instruction and intervention in basic mathematics concepts and skill
- Academic language is as central to mathematics as it is to other academic areas. It is a significant source of difficulty for many ELs who struggle with mathematics
- ELs need academic language support to understand and solve the word problems that are often used for mathematics assessment and instruction

Additionally, the Alabama State Department of Education provides recommendations developed by the National Council of Teachers of Mathematics for teaching math to ELs, as shown in the following figure.

Guiding Principles for Teaching Mathematics to English Language Learners

| GUIDING PRINCIPLES | DESCRIPTIONS |
|--|--|
| Challenging mathematical tasks | Students at all levels of English language development need challenging mathematical tasks, made accessible through supports that clarify their understanding of the task. Although the tasks may be the same for all levels, the teacher actions required for students to have access to them and to communicate their understanding often differ at each level. |
| Linguistically sensitive social environment | Mathematical learning occurs in a linguistically sensitive social environment that takes into consideration linguistic demands and discourse elements and is characterized by teacher-supported, ongoing, high-quality interactions that include all forms of communication between teachers and students and between students and students. |
| Support for learning English while learning mathematics | Facility with the English language is acquired when ELs learn mathematics through effective instructional practices, including support structures that scaffold students' language development, engage students in MDCs (Mathematics Discourse Community), make mathematics content linguistically comprehensible to them and assess their progress in reaching predetermined linguistic and mathematical goals. |
| Mathematical tools and modeling as resources | Mathematical tools and mathematical modeling provide a resource for ELs to engage in mathematics and communicate their mathematical understanding and are essential in developing a community that enhances discourse. |
| Cultural and linguistic differences as intellectual resources | Students' cultural and linguistic differences in the mathematics community should be viewed as intellectual resources rather than as deficits and should be used in the classroom to connect to prior knowledge and to create a community whose members values one another's ways of engaging in mathematics. |

Source: National Council of Teachers of Mathematics⁷²¹

⁷¹⁶ Francis, D.J. et al. “Practical Guidelines for the Education of English Language Learners: Research-Based Recommendations for Instruction and Academic Interventions.” Center on Instruction, 2006. p. 34. <https://www2.ed.gov/about/inits/ed/lep-partnership/interventions.pdf>

⁷¹⁷ Ibid.

⁷¹⁸ Ibid., pp. 36–37.

⁷¹⁹ Robertson, K. “Math Instruction for English Language Learners.” Colorín Colorado. <http://www.colorincolorado.org/article/math-instruction-english-language-learners>

⁷²⁰ Bullet points quoted verbatim from: Francis et al., Op. cit., pp. 40–41.

⁷²¹ Figure contents quoted verbatim with modification from: “Guiding Principles for Teaching Mathematics to English Language Learners.” Alabama State Department of Education. From: Celedon-Pattichis, S. and N.G. Ramirez. *Beyond Good Teaching: Advancing*

Teachers may use explicit instruction to help ELs understand terminology specific to math and words that have different meanings in math and non-math contexts (e.g., the term “difference” or “table”).⁷²² Teachers should also use mathematics vocabulary regularly and consistently during instruction and conversations with students. In a 2016 NCTM *Teaching Children Mathematics* article, Banse et al. note that, when “exposed to mathematical vocabulary use in their teacher’s language use, [ELs] may be more likely to include mathematical vocabulary in their own responses as the year progresses.”⁷²³ The figure below highlights four strategies for developing ELs’ math vocabulary.

Strategies for Developing ELs’ Mathematics Vocabulary

- **Demonstrate that vocabulary can have multiple meanings.** Help students understand the different meanings of words such as “table” and “quarter,” as well as how to use them correctly in a mathematical context.
- **Encourage students to offer bilingual support to each other.** Students will understand material better if they explain it to another student, and the new student will benefit from hearing the explanation in their first language.
- **Provide visual cues, graphic representations, gestures, realia, and pictures.** Offer students the chance to work with objects and images in order to master vocabulary. If there aren’t enough items for each student, use manipulatives on the overhead or posted throughout the classroom, and demonstrate the vocabulary in front of the students.
- **Identify key phrases or new vocabulary to pre-teach.** This strategy will help students decide which math function they should apply. Example: “more than” means “add.”

Source: Colorín Colorado⁷²⁴

Furthermore, because of the oral language and verbal reasoning skills needed to understand and solve word problems, ELs often find these problem types particularly challenging.⁷²⁵ According to the COI, solving word problems requires “knowledge of the specific meaning of many words,” “understanding of the syntactic structures of the questions,” comprehension of figurative language, and the ability to refer to relevant background knowledge – all of which may prove especially difficult for ELs.⁷²⁶ Thus, to strengthen ELs’ ability to engage in mathematical discourse, teachers may rephrase problems, help students identify a problem’s structure, strategically use manipulatives, and provide guidelines for eliminating extraneous vocabulary in problems.⁷²⁷ Teachers also may use the additional strategies summarized in the following figure.

Strategies for Scaffolding ELs’ Mathematical Discourse

| RECOMMENDATION | PURPOSE | EXAMPLE |
|--|--|---|
| Ask open-ended questions of all students, including ELs. | Gives ELs the opportunity to explain and justify their mathematical reasoning. | Begin the class with a question that includes a “how” or “why” stem, such as, “Is this shape a square? Why or why not?” |

Mathematics Education for ELLs. National Council of Teachers of Mathematics, 2012.

<https://www.alsde.edu/sec/fp/ell/SAMUEL%205/Secondary%20Guiding%20Principles%20for%20Teaching%20Mathematics%20to%20ELs.pdf>

⁷²² Robertson, “Math Instruction for English Language Learners,” Op. cit.

⁷²³ Banse, H.W. et al. “5 Strategies for Scaffolding Math Discourse with ELLs.” *Teaching Children Mathematics*, 23:2, 2016. p. 106.
<https://www.scribd.com/document/347773126/banse-et-al-5-strategies-for-scaffolding-math-discourse-with-ells>

⁷²⁴ Robertson, “Math Instruction for English Language Learners,” Op. cit.

⁷²⁵ Francis et al., Op. cit., p. 49.

⁷²⁶ Ibid.

⁷²⁷ Robertson, “Math Instruction for English Language Learners,” Op. cit.

| RECOMMENDATION | PURPOSE | EXAMPLE |
|--|--|---|
| Scaffold ELs with close-ended questions, as needed. | Contingent display questions are close-ended, follow-up questions that teachers can use to guide students who are grappling with a more complex question. Multiple-option display questions have more than one potential correct answer or explanation. These questions may be familiar and less challenging to students because they are questions that are regularly asked. | Sequence close-ended questions to help a student work through a word problem. Then, ask for explanations behind close-ended questions. |
| Scaffold responses by revoicing. | Repeat, extend, and re-articulate students' responses using mathematical language that is more precise. Doing this may model both mathematical reasoning and mathematical language usage, while emphasizing the mathematical content in the student's response. | Recast students' ideas using precise mathematical language: Teacher: I want you to explain what you are going to do first. Student: Something that equals seven. Teacher: So you are going to think of an expression that equals seven, and it will become an equation, right? |
| Model vocabulary in context. | Beyond defining mathematical vocabulary, use it in context, so that students understand how to incorporate vocabulary into their own responses. | Be consistent in using vocabulary: Teacher: She says we have a vertical line of symmetry and a horizontal line of symmetry. Is that true? |
| Strive to engage ELs in discourse each day. | Remember that ELs' language proficiency is not necessarily indicative of their mathematical understanding, and encourage them to participate in mathematical discourse. | Use all activities as opportunities to engage all students in discourse. |

Source: *Teaching Children Mathematics*⁷²⁸

Educators can also use **visuals and manipulatives** to assist EL students struggling with the academic language of math. Visual cues and graphic representations help both elementary and secondary ELs master math vocabulary and math problems with challenging structures.⁷²⁹ For example, in an article on ways to help EL students succeed in math, Scholastic highlights the benefit of creating vocabulary banks or charts that contain key math vocabulary words or phrases, which can be “helpful references for [ELs] when discussing or writing about their math thinking, especially if the words are accompanied by illustrations.”⁷³⁰ Using manipulatives – or tools that make math content more comprehensible – can also be useful, as these tools “give students ways to construct physical models of abstract mathematical ideas, build students’ confidence by giving them a way to test and confirm their reasoning, and make learning math interesting and enjoyable.”⁷³¹ Sample manipulatives include base ten blocks, rulers, number lines, geoboards, algebra tiles, paper money, and calculators.⁷³² Additionally, the University of New York (NYU) provides a resource, [available here](https://steinhardt.nyu.edu/scmsAdmin/uploads/004/738/NYU_PTE_Math_Module_For_ELLS_Oct_8_2009.pdf), that contains multiple strategies with step-by-step procedures and examples for teaching math to ELs, such as Think Alouds and Venn diagrams.⁷³³

⁷²⁸ Banse et al., Op. cit., p. 103.

⁷²⁹ [1] Robertson, “Math Instruction for English Language Learners,” Op. cit. [2] “A Framework for Re-Envisioning Mathematics Instruction for English Language Learners.” The Council of the Great City Schools, December 2016. p. 14. <https://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/87/FrameworkForMath4ELLS.pdf>

⁷³⁰ “10 Ways to Help ELLs Succeed in Math.” Scholastic. <https://www.scholastic.com/teachers/articles/teaching-content/10-ways-help-ells-succeed-math/>

⁷³¹ Ibid.

⁷³² “ELLs and Mathematics.” New York University Steinhardt, 2009. p. 26.

https://steinhardt.nyu.edu/scmsAdmin/uploads/004/738/NYU_PTE_Math_Module_For_ELLS_Oct_8_2009.pdf

⁷³³ Ibid.

Another strategy for assisting ELs struggling with mathematical language includes using **sentence frames**, which provide support for ELs to participate in math discussions, contextualize new math vocabulary, allow ELs to practice new vocabulary in complete and correct sentences, and prepare ELs for writing. The figure below, highlights an example of sentence frames that provide support for ELs with different proficiency levels for discussing polygons.⁷³⁴

Sample Sentence Frames by Proficiency Level

| PROFICIENCY LEVEL | SENTENCE FRAME |
|--------------------|---|
| Beginning Level | This is not a <u>polygon</u> . It is/has <u>curves</u> . |
| Intermediate Level | This is not a <u>polygon</u> because it has <u>curves</u> , and <u>is open</u> . |
| Advanced Level | This shape <u>has four straight sides</u> , <u>four vertices</u> , and <u>is closed</u> ; therefore, it is a <u>polygon</u> . |

Source: Scholastic⁷³⁶

Click the link below to access a resource developed by researchers at Stanford University that provides language-focused math activity templates.⁷³⁵

[Language of Mathematics Task Templates](https://ell.stanford.edu/sites/default/files/math_learnmore_files/4.Language%20of%20Math%20Task%20Templates%2010-4-13.pdf)

ADDITIONAL EFFECTIVE INSTRUCTIONAL STRATEGIES

COOPERATIVE AND PEER LEARNING STRATEGIES

Research shows that cooperative learning strategies, where students work together in small groups to support one another's learning, effectively support the language development of both elementary and secondary ELs across multiple subjects.⁷³⁷ For example, a 2016 literature review finds that "peer tutoring encourages gains for ELs of varying levels of English proficiency," and evidence also suggests that **peer tutoring provides additional academic and social benefits for ELs**.⁷³⁸ Additionally, a 2007 review of research on peer tutoring for ELs by the What Works Clearinghouse (WWC) finds evidence of positive effects of peer tutoring on English language development.⁷³⁹

When implementing cooperative learning strategies, teachers should promote learning, respect, and social connections between students. Research shows that cooperative learning is effective for all types of students: ELs, regular education students, students with disabilities, and gifted and talented students. The more heterogeneous a collaborative group is, the greater the benefit to participants. Teachers should divide students into groups for a variety of activities and establish guidelines that help students contribute, stay on-task, and share feedback.⁷⁴⁰ Sources that contain cooperative learning activities for ELs include:⁷⁴¹

⁷³⁴ "10 Ways to Help ELLs Succeed in Math." Scholastic. <http://www.scholastic.com/teachers/articles/teaching-content/10-ways-help-ells-succeed-math/>

⁷³⁵ "Language of Mathematics Task Templates." Understanding Language, Stanford University. https://ell.stanford.edu/sites/default/files/math_learnmore_files/4.Language%20of%20Math%20Task%20Templates%2010-4-13.pdf

⁷³⁶ Figure contents quoted verbatim from: Ibid.

⁷³⁷ Calderón, M., R. Slavin, and M. Sánchez. "Effective Instruction for English Learners." *The Future of Children*, 21:1, 2011. p. 113. <https://muse.jhu.edu/article/446011/summary>

⁷³⁸ Bowman-Perrott, L. et al. "Assessing the Academic, Social, and Language Production Outcomes of English Language Learners Engaged in Peer Tutoring: A Systematic Review." *Education & Treatment of Children*, 39:3, August 2016. p. 378. Accessed via EBSCOhost.

⁷³⁹ "Peer Tutoring and Response Groups." What Works Clearinghouse, 2007. p. 1. <http://eric.ed.gov/?id=ED499296>

⁷⁴⁰ "Cooperative Learning Strategies." Colorín Colorado. <http://www.colorincolorado.org/article/cooperative-learning-strategies>

⁷⁴¹ Bulleted links obtained from: "Cooperative Learning Strategies," Op. cit. [2] Schutt, A. "Literature Circles." Colorín Colorado. <https://www.colorincolorado.org/article/literature-circles> [3] Robertson, K. "Increase Student Interaction with 'Think-Pair-Shares' and 'Circle Chats.'" Colorín Colorado. <https://www.colorincolorado.org/article/increase-student-interaction-think-pair-shares-and-circle-chats>

- Cooperative Learning Strategies
- Literature Circles
- Increase Student Interaction with "Think-Pair-Shares" and "Circle Chats"

Additionally, the following figure lists additional cooperative learning strategies to facilitate language acquisition and content knowledge development.

Cooperative Learning Strategies

| STRATEGY | DESCRIPTION |
|-------------------------|--|
| Numbered Heads Together | Ask students to number off. Announce a question. Students collaborate to come up with an answer. Ask all students with one number to answer the question. |
| Roundtable | Present a category. Have students take turns writing a word that fits the category. |
| Write around | Ask all students in a team to finish a prepared sentence. Then, they pass their papers and add a sentence to the one they received. After a few rounds, four stories emerge. Give students time to add a conclusion and edit one to share. |
| Team Jigsaw | Assign each student in a team part of a page to read or part of a topic to investigate. Each student completes her assignment and helps to put together a team product. |

Source: Colorín Colorado⁷⁴²

SENSORY, GRAPHIC, AND INTERACTIVE SUPPORTS

Teachers can also consider using sensory, graphic, and interactive supports when educating ELs.⁷⁴³ These supports can take the form of media, technology, or games. Media includes materials such as books, arts, and movies, and technology encompasses software such as social media, word processors, and video recording. Games can include sports, card games, or board games.⁷⁴⁴ The next figure displays some other examples of sensory, graphic, and interactive supports. Notably, WIDA considers cooperative learning as a type of interactive support for ELs.

Examples of Sensory, Graphic, and Interactive Supports

| Sensory Supports | Graphic Supports | Interactive Supports |
|--|---|---|
| <ul style="list-style-type: none"> • Manipulatives • Pictures and photographs • Illustrations and diagrams • Magazines and newspapers • Physical activities • Videos and films • Models and figures | <ul style="list-style-type: none"> • Charts • Graphic organizers • Tables • Graphs • Timelines • Number lines | <ul style="list-style-type: none"> • In pairs, triads, or small groups • In a whole group • Using cooperative groups • With websites or software • In the primary language • With mentors |

Source: WIDA⁷⁴⁵

TECHNOLOGY

Teachers should carefully consider what technology to implement as instructional resources for ELs. Well-selected hardware and software can help ELs express themselves and engage in meaningful language development. Technological resources should promote interaction with academic content, familiarity with

⁷⁴² Figure adapted from: Ibid.

⁷⁴³ "2012 Amplification of the English Language Development Standards: Kindergarten-Grade 12." Board of Regents of the University of Wisconsin System and WIDA, 2016. p. 11. <http://hamburgschool.com/wp-content/uploads/2016/12/WIDA-2012-Amplified-ELD-Standards.pdf>

⁷⁴⁴ "WIDA Focus on Technology in the Classroom." WIDA Consortium, 2014. p. 3. <https://wida.wisc.edu/sites/default/files/resource/FocusOn-Technology-in-the-Classroom.pdf>

⁷⁴⁵ Figure adapted from: "2012 Amplification of the English Language Development Standards," Op. cit., p. 11.

academic language, and positive peer interactions.⁷⁴⁶ The following figure presents evaluative questions in four key areas that schools and teachers can use to assess the utility of a given technological resource.

Evaluation Questions for Technological Resources for ELs

| TOPIC | QUESTIONS |
|-----------------------------------|---|
| Content | <ul style="list-style-type: none"> What exactly are the learners watching or interacting with? Can the learners make sense of the content? Will students try to imitate what happens on the screen? What could be learned from the content? How might this relate to learning goals? Does this content develop various literacies? How does this work with other classroom content? Are there ways to export evidence or view outcomes after the learner interacts with the media? |
| Context | <ul style="list-style-type: none"> What would the learners be doing if they were not doing this? Where are students watching or interacting with the media? Is an adult helping students figure out what they see? How can this foster other kinds of play or experimentation? Does this activity involve peers? How? Does this foster connections to home? Co-viewing? Intergenerational play? Is the play competitive or collaborative? How is the learner physically interacting with the media? |
| Communication and Language | <ul style="list-style-type: none"> What purposes for using language are elicited? How are reading, listening, writing, and speaking being supported through the activities? How accessible is the language of the activity given the language learner's abilities? What opportunities exist for new language acquisition? How do the situations and activities connect to reinforce and elicit academic language? How do the learners make meaning from the things they see and do? |
| The Individual Student | <ul style="list-style-type: none"> Is this activity appropriate for this learner's age, state of development, or temperament? Does this media tool fall in line with appropriate levels of stimulation for this learner? Is there anything in this experience that could violate feelings of safety or scare the learner? Does this media tool have the power to trigger curious questions? Playful reenactments? Engagement? What roles and identities might the learner be assuming in the activity? |

Source: WIDA⁷⁴⁷

There are many online programs available for districts to purchase that support ELs, including:

- Scholastic** offers the Zip into Language, Zoom into Reading! Program for ELs in Kindergarten through Grade 3.⁷⁴⁸
- Savvas Learning Company** also publishes research-based programs to support ELs and teachers of ELs.⁷⁴⁹
- Ellevation** and **Imagine Learning** offer tools to assist ELs with language acquisition.⁷⁵⁰

⁷⁴⁶ "WIDA Focus on Technology in the Classroom," Op. cit., p. 8.

⁷⁴⁷ Figure adapted from: Ibid., pp. 9–10.

⁷⁴⁸ "Zip Into Language. Zoom Into Reading! Grades K-3." Scholastic. <http://teacher.scholastic.com/products/zipzoom/overview/student.htm>

⁷⁴⁹ "English Language Learner Curriculums and Textbooks." Savvas Learning Company. <https://www.savvas.com/?locator=PSZu71>

⁷⁵⁰ [1] "Expect More for Your EL Program." Ellevation. <https://ellevationeducation.com/home/default> [2] "Imagine Language & Literacy." Imagine Learning. <https://www.imaginelearning.com/literacy/language-and-literacy>

GRAPHIC ORGANIZERS

Using graphic organizers provides ELs with a visual representation of course content and can help students to categorize new knowledge. Graphic organizers reinforce connections between ideas and help students during the introduction of new content. Students can use organizers and accompanying discussion to connect new material to prior learning. Graphic organizers can also help ELs with vocabulary acquisition by illustrating and connecting key terms.⁷⁵¹

The utility of graphic organizers stems from their ability to help ELs organize information without depending on language.⁷⁵² Graphic organizers require minimal language, yet facilitate meaningful learning through visual representation. Graphic organizers enable ELs to identify content patterns through an easier mechanism compared to lesson text.⁷⁵³

In a research study published in the journal *Second Language Studies*, author Jessica Lynn Wells Miranda of the University of Hawaii at Mānoa assessed one EL student with disabilities and two EL-only students in Grade 6 in reading and writing before a graphic organizer-centered intervention. She determined students' baseline reading and writing levels and then delivered a five-segment instructional plan featuring one graphic organizer per segment. The students received intensive instruction in vocabulary, oral reading, and graphic organizer usage. Following the delivery of post-assessments, Miranda found that the students demonstrated improved content and relational knowledge, reading comprehension, and writing ability.⁷⁵⁴

There are many free graphic organizers available online for use by teachers of ELs, including:

- **Education Oasis**, a catalog of teacher-produced resources, offers over 60 organizers.⁷⁵⁵
- **TeacherVision**, a catalog of thousands of lesson plans, assessments, and instructional materials, provides organizers targeting specific grades and academic disciplines.⁷⁵⁶

NON-ACADEMIC SUPPORTS FOR ELs

The following section discusses strategies for supporting ELs' social-emotional development and incorporating aspects of ELs' culture into the classroom.

SUPPORTING ELs' SOCIAL-EMOTIONAL DEVELOPMENT

Along with general instructional recommendations, it is also important to consider practices to support the non-academic skills and social and emotional learning (SEL) of EL students, who often face unique social and cultural barriers in U.S. public schools. **Research suggests that ELs may be at a higher risk for SEL and behavioral problems as compared to their general education peers.** This may be due to difficulty initiating social interactions with teachers and peers, feelings of alienation, and stress from cultural changes and acculturation, among other factors.⁷⁵⁷ Additionally, ELs in middle and high school may have additional stressors that impact their social-emotional well-being, including family obligations (e.g., household,

⁷⁵¹ Sigüeza, T. "Using Graphic Organizers with ELLs." Colorín Colorado. <http://www.colorincolorado.org/article/using-graphic-organizers-ells>

⁷⁵² Breiseth, L. "Reading Comprehension Strategies for English Language Learners." ASCD. <http://www.ascd.org/ascd-express/vol5/511-breiseth.aspx>

⁷⁵³ Herr, N. "Strategies for Teaching Science to English Language Learners." The Sourcebook for Teaching Science, 2007. <https://www.csun.edu/science/ref/language/teaching-ell.html>

⁷⁵⁴ Miranda, J.L.W. "Effect of Graphic Organizers on the Reading Comprehension of an English Language Learner with a Learning Disability." *Second Language Studies*, 30:1, Fall 2011. pp. 104-111. 119-120. https://scholarspace.manoa.hawaii.edu/bitstream/10125/40715/1/Wells%20Miranda%20%282011%29_30%281%29.pdf

⁷⁵⁵ "Graphic Organizers." Education Oasis. <http://www.educationoasis.com/printables/graphic-organizers/>

⁷⁵⁶ "Graphic Organizers." TeacherVision. <https://www.teachervision.com/lesson-planning/graphic-organizer>

⁷⁵⁷ [1] Haynes, J. "9 Ideas to Support ELs' Social-Emotional Learning." TESOL International Association, May 2015. <http://blog.tesol.org/9-ideas-to-support-els-social-emotional-learning/> [2] "Chapter 4: How Do We Support Newcomers' Social Emotional Needs?" Newcomer Toolkit, U.S. Department of Education, September 2017. p. 3. <https://www2.ed.gov/about/offices/list/oela/newcomers-toolkit/chap4.pdf>

childcare, financial, and translation responsibilities) and additional social needs.⁷⁵⁸ To this end, a 2015 presentation at Adelphi University highlights the importance of meeting EL students' unique SEL needs. The presentation suggests that districts and teachers should aim to develop cultural awareness and empathy, provide a comfort zone, spotlight respect for all cultures, create community ties with parents, informally assess SEL growth, and not discourage native language use.⁷⁵⁹ Furthermore, teachers can implement instructional practices that support the development of ELs' social and emotional skills. The following figure presents ten teaching practices that teachers can use to support students' social-emotional skills and positive learning environments. Notably, teachers can adapt the practices to fit their grade-level, content area, and students' unique learning needs.⁷⁶⁰

Teaching Practices that Support Students' Social Emotional Development

| TEACHING PRACTICE | DESCRIPTION |
|--|---|
| Student-Centered Discipline | Student-centered discipline refers to the types of classroom management strategies teachers use. To be effective at student-centered discipline, teachers need to use disciplinary strategies that are developmentally appropriate for their students and that motivate students to want to behave in the classroom. |
| Teacher Language | Teachers should encourage student effort and work, restating what the student did and what that student needs to do in order to improve. For example, teacher language should not be simply praise (e.g., "You did a great job") but should encourage students (e.g., "I see you worked hard on your math paper. When you really think about your work, and when you explain your thinking, you get more correct answers"). |
| Responsibility and Choice | Teachers should create a classroom environment where democratic norms are put into place and where students provide meaningful input into the development of the norms and procedures of the classroom as well as the academic content or how the academic content is learned. Democratic norms do not mean that everything the students say gets done, but the teacher provides structures so that the students have a voice in the classroom. |
| Warmth and Support (Teacher and Peer) | Warmth and support refers to the academic and social support that students receive from their teacher and from their peers. The teacher creates a classroom where the students know that teachers care about them. Teachers can demonstrate that they care about their students by asking students questions (academic and nonacademic) and following up with students when they have a problem or concern. |
| Cooperative Learning | Cooperative learning refers to a specific instructional task in which teachers have students work together toward a collective goal. Teachers ask students to do more than group work; students are actively working with their peers around content in a meaningful way |
| Classroom Discussions | Classroom discussions are conversations students and teachers have around content. During classroom discussions, teachers ask open-ended questions and ask students to elaborate on their own thinking and on the thinking of their peers |
| Self-Reflection and Self-Assessment | Self-reflection and self-assessment are instructional tasks whereby teachers ask students to actively think about their own work. For students to self-reflect on their work, teachers should ask them to assess their own work using criteria and rubrics. |
| Balanced Instruction | Teachers should use an appropriate balance between active instruction and direct instruction, and between individual and collaborative learning. |
| Academic Press and Expectations | Academic press refers to a teacher's implementation of meaningful and challenging work and academic expectations based on the belief that all students can and will succeed. Students should sense that academics are extremely important, that the teacher wants them to succeed, and that they have to exert effort in challenging work in order to succeed. |

⁷⁵⁸ Lawrence, M. "Social and Emotional Needs of Middle and High School ELLs." Text. Colorín Colorado.

<http://www.colorincolorado.org/article/social-and-emotional-needs-middle-and-high-school-ells>

⁷⁵⁹ Thornburg, D. "Understanding and Addressing the Social-Emotional Needs of ELL Students." Adelphi University, December 2015. p. 13.

https://www.esboces.org/site/handlers/filedownload.ashx?moduleinstanceid=2674&dataid=4105&FileName=Understanding%20and%20Addressing%20Social%20Emotional%20Needs%20of%20ELLs%20_12-4-15.pdf

⁷⁶⁰ "Chapter 4: How Do We Support Newcomers' Social Emotional Needs?," Op. cit., p. 10.

| TEACHING PRACTICE | DESCRIPTION |
|---|--|
| Competence Building, Modeling, Practicing, Providing feedback, and Coaching | Competence-building occurs when teachers help develop social emotional competencies systematically through the typical instructional cycle: lesson goals and objectives; introduction to new material, and modeling; group and individual practice; and conclusion and reflection. |

Source: U.S. Department of Education and Center on Great Teachers⁷⁶¹

Furthermore, the Teaching of English to Speakers of Other Languages (TESOL) International Association, an organization that aims to advance the quality of English language teaching, highlights several additional practices that teachers and school districts can take to support EL students' SEL skills:⁷⁶²

- **Directly teach skills that allow ELs to manage stressful situations.** It is important to provide a realistic context for these situations (classroom, hallway, playground, cafeteria).
- **If ELs are exhibiting negative behavior, teach a lesson that includes scenarios that students can role-play.** The use of role-play fosters SEL for ELs. Have students gain knowledge about how to observe their peers for models of correct behavior. This can be direct observation or video.
- **Promote SEL for ELs' social skills by using children's literature.** Not only do children's stories include common difficulties that ELs may have in school, but they include solutions to these problems. A series developed by Teaching Tolerance entitled "Perspectives of a Diverse America" addresses anti-bias and encourages the use of a multicultural curriculum.
- **Have students practice phrases to ease social interactions.** For example, learning how to approach a teacher to ask a question or engage a classmate in a conversation can help ELs develop the social skills that they need to bond with their classmates and teachers.
- **Give ELs encouraging messages every day.** Messages such as "I like the way you..." and "I can see you are really trying" can encourage ELs as they are learning. Use gestures to accompany your positive message (thumbs up, pat on the shoulder, high five, smile) so that a child whose English is limited will understand that you are saying something positive.
- **Teach social skills that are valued by the ELs' families, and involve parents in reinforcing these skills at home.** For example, learning how to greet other children and adults in English can increase ELs' confidence during social interactions. If parents emphasize the same skills in their home language, they will be more meaningful for students.
- **Help ELs acquire pride in their culture.** In addition to an annual multicultural fair or food tasting, incorporate pride-building activities into everyday instruction (e.g., multicultural books, video, multimedia resources).
- **Help ELs develop self-esteem by supporting their academic progress.** Scaffold content information so that ELs feel successful in school. Classroom teachers need to learn what ELs should be able to do at different levels of language acquisition so that they are not putting too much pressure on them to reach academic goals that they don't yet have the language to achieve.
- **ELs may have negative feelings about themselves in response to many situations that they experience at school.** Teach ELs positive self-talk so that they can better manage their feelings. Have them write positive messages that they can use in either their home language or English to help build self-esteem.

⁷⁶¹ Figure reproduced verbatim with modification from: Ibid., pp. 10–11. Originally from: Yoder, N. (2014). Teaching the whole child: Instructional practices that support social-emotional learning in three teacher evaluation frameworks. Center on Great Teachers and Leaders. <http://www.gtlcenter.org/sites/default/files/TeachingtheWholeChild.pdf>

⁷⁶² Bullet points taken verbatim from: Haynes, Op cit.

Click the link below for Chapter 4 of the U.S. Department of Education's Newcomer Toolkit for additional resources for supporting EL's social emotional development, including problem-solving steps, lesson ideas, and strategies for addressing discrimination:⁷⁶³

["How Do We Support Newcomers' Social Emotional Needs?"](#)

INCORPORATING ASPECTS OF ELs' CULTURES INTO THE CLASSROOM

Teachers can support ELs by ensuring that the classroom environment is a place where all students feel they belong and have value. While all students should feel safe and valued in the classroom, experts especially recommend ensuring that the classroom setting is familiar and comfortable, especially for young learners. Specifically, experts recommend decorating classrooms or other spaces with posters or pictures related to ELs' home cultures to increase their comfort, and providing instructional resources, books, and games that incorporate students' home culture and language to further ease their transition. Additional recommended practices include labeling all areas of the classroom in both English and the students' home languages (when possible), and displaying visuals that promote connections between the students' home languages and English.⁷⁶⁴ Teachers should also be proactive to prevent teasing or stereotypical labeling that may isolate ELs.⁷⁶⁵

Strategies for establishing an inclusive learning environment that incorporates students' home language and cultures appear in the figure below. This list, adapted from an article in the journal *Young Children*, emphasizes visual, auditory, and gustatory attributes, as well as social and emotional comfortability. Teachers seeking to implement these provisions can obtain assistance from ELs' families, community organizations, travel agencies, and tourism businesses that may have access to print, digital, and other materials from many cultures.⁷⁶⁶ Notably, while these strategies are targeted to teachers of students in the early childhood and elementary grades, teachers of students of all grade levels can select and adapt these practices to create inclusive learning environments that support their ELs' unique needs.

⁷⁶³ "Chapter 4: How Do We Support Newcomers' Social Emotional Needs?" U.S. Department of Education.

⁷⁶⁴ Espinosa, L.M. and E.S. Magruder. "Chapter 4: Practical and Proven Strategies for Teaching Young Dual Language Learners." In *Getting It Right for Young Children from Diverse Backgrounds: Applying Research to Improve Practice with a Focus on Dual Language Learners*, Pearson Higher Ed, 2014. p. 87. https://www.earlychildhoodwebinars.com/wp-content/uploads/2016/01/Chapter-4_Practical-and-Proven-Strategies-for-Teaching-Young-Dual-Language-Learners.pdf

⁷⁶⁵ "Helping Preschoolers Learn in Two Languages." Illinois Early Learning Project, September 2013. <https://illinoisearlylearning.org/tipsheets/bilingual-classroom/>

⁷⁶⁶ Nemeth, K. "Meeting the Home Language Mandate: Practical Strategies for All Classrooms." *Young Children*, 64:2, March 2009. p. 39. <https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/Domains%20of%20Child%20Development/Language%20Development%20and%20Communication/meetingthelanguage.pdf>

Characteristics of an Inclusive Early Learning Environment for DLLs

| ENVIRONMENT CHARACTERISTIC | STRATEGIES |
|----------------------------|---|
| How does it look? | <ul style="list-style-type: none"> Culturally authentic pictures and posters appear in classrooms, shared spaces, and welcome areas. Authentic items from each child's culture and language are available, to include: food containers, menus, games, dolls, instruments, clothing, and art supplies. Books and games in the languages of all the children are available. Labels in home languages are posted throughout the classroom—with pronunciations, if needed—to help teachers use words in each child's language. During instructional time, the teacher uses props that correspond to new vocabulary. The teacher uses gestures, voice changes, and facial expressions while speaking. The teacher may pair children who speak the same home language so the child who is more proficient in English can help her partner understand and share in the discussion or activity. Activities and learning threads continue for days at a time, giving DLLs a chance to reaffirm newly-learned vocabulary and build on prior knowledge. To help children feel secure, there is a <i>survival phrases chart</i> with photographs of children fulfilling basic needs (e.g., eating, sleeping, and using the restroom) that a child can point to as necessary. |
| How does it sound? | <ul style="list-style-type: none"> Bilingual visitors join classroom activities such as reading books or playing outdoors to engage children in conversations in their home languages. Children speak with their friends and teachers in their home languages many times during the day. Music that genuinely represents every child's country or culture plays at different times of the day. A child volunteers to act as the translator between children or between children and adults. Sometimes during small group activities, children are instructed in their home language. The teacher teaches familiar songs in more than one language. Parent volunteers read books written in the home languages of the children. |
| How does it taste? | <ul style="list-style-type: none"> The teacher encourages conversations in children's home languages at mealtimes. Students share food from home cultures to broaden everyone's experiences and build community. Recipes from home form the basis for engaging math and science learning while also celebrating children's cultures and building on the learning they have acquired at home. |
| How does it feel? | <ul style="list-style-type: none"> Children feel welcomed, supported, and encouraged by teachers. The classroom feels safe because the teachers do not allow any teasing, bullying, or isolation. Teachers help all the children learn to communicate and play together. Families feel welcomed and respected because information is available in their home language. |

Source: *Young Children*⁷⁶⁷

Teachers can also create classroom libraries that appeal to multiple cultures, produce equity in multicultural representation, and inspire enthusiasm for literacy. Culturally responsive books enhance ELs' self-perceptions and respectfully represent non-dominant cultures. Such literature provides engaging text to serve as a launching point for literacy development. When assembling a school or classroom library, educators should try to represent all student cultures and languages. Moreover, teachers will want to carefully analyze texts to ensure no stereotypical portrayals appear in a narrative.⁷⁶⁸

⁷⁶⁷ Figure contents adapted from: Ibid., pp. 39, 41–42.

⁷⁶⁸ "WIDA Focus on the Early Years: Supporting Early Literacy Development." University of Wisconsin-Madison and World-Class Instructional Design and Assessment, 2016. p. 8. <https://www.wida.us/get.aspx?id=1952>

Click the links below for Colorín Colorado's recommendations of books that represent a wide range of languages and cultures:⁷⁶⁹

- [Books for Young Students](#)
- [Books for Students in Grades 4-12](#)

⁷⁶⁹ Bulleted links obtained from: [1] "Books for Kids." Colorín Colorado. <https://www.colorincolorado.org/books-authors/books-kids> [2] "Books for Young Adults." Colorín Colorado. <https://www.colorincolorado.org/books-authors/books-young-adults>

REPORT III: ACADEMIC SUPPORTS FOR LONG-TERM ENGLISH LEARNERS

INTRODUCTION

In this report, Hanover reviews the secondary literature on strategies to provide academic supports for **long-term English learners (LTELs)**. The population of LTELs has steadily increased in U.S. schools as a percentage of all English learners, and in California alone, grew from 62 percent of all secondary school English learners in 2008 to 82 percent in 2016.⁷⁷⁰ While LTELs remain a large subgroup of the EL population, their unique needs may be overlooked by larger support systems on the whole. As such, the following report is intended to support districts in identifying strategies to improve academic achievement among its population of LTELs according to evidence-based best practice.

OVERVIEW OF LONG-TERM ENGLISH LEARNERS

In the following section, Hanover presents a brief overview of long-term English learners (LTELs), the characteristics that define this student subgroup, and their specific educational needs.

LONG-TERM ENGLISH LEARNERS DEFINED

One of the fastest growing subgroups, by 2014, there were almost five million EL students enrolled in public schools across the country. The significant majority of these students are young children (i.e., Kindergarten through Grade 5), with proportionately smaller populations as they progress through middle and high school.⁷⁷¹ **Research repeatedly shows that as ELs enter later grades, however, it becomes harder and harder for them to achieve at grade-level standards.** Indeed, English learners who continue to require dedicated English as a second language (ESL) instruction for five or more years regularly lag in *every grade level*.⁷⁷² These students often require specialized supports to make up these long-term performance gaps.

Continually confronted by challenges to language skill acquisition, many students from language minority backgrounds enter the secondary grades as LTELs. A 2014 report on this subgroup prepared by the National Education Association (NEA), for example, estimates that around 60 percent of ELs enrolled in high schools in California are LTELs, and that between 25 and 50 percent of ELs who enter U.S. schools in the elementary grades eventually become LTELs.⁷⁷³ In fact, the total number of LTELs enrolled in secondary schools in California increased from 344,862 during the 2008-09 academic year to 380,995 in 2015-16.⁷⁷⁴

Although most states and education agencies define “long-term” differently, a commonly accepted timeframe for traditional EL students to exit English-language programming is less than six years. After six years of receiving dedicated EL or ESL services, students are often classified as LTELs.⁷⁷⁵ At large, LTELs may be defined by three key traits:⁷⁷⁶

- They are students who have been **enrolled in U.S. schools for six years or more**
- They are **stalled in progressing towards English proficiency** without having yet reached a threshold of adequate English skills
- They are **struggling academically**

⁷⁷⁰ Chen-Gardini, M. and E. Burr. “Long-Term English Learner Students: Spotlight on an Overlooked Population.” WestEd, November 2016. p.1. <https://relwest.wested.org/system/resources/236/LTEL-factsheet.pdf?1480559266>

⁷⁷¹ “Digest of Education Statistics: Table 204.27.” National Center for Education Statistics, March 2017. https://nces.ed.gov/programs/digest/d16/tables/dt16_204.27.asp

⁷⁷² Flores, S.M., J. Batalova, and M. Fix. “The Educational Trajectories of English Language Learners in Texas.” Migration Policy Institute, March 2012. p.1. <http://www.migrationpolicy.org/sites/default/files/publications/TexasELs.pdf>

⁷⁷³ Olsen, L. “Meeting the Unique Needs of Long Term English Language Learners.” National Education Association, March 2014. p. 4. http://www.rcoe.us/educational-services/files/2012/08/NEA_Meeting_the_Unique_Needs_of_LTELs.pdf

⁷⁷⁴ Ibid.

⁷⁷⁵ Chen-Gardini, M. and E. Burr. “Long-Term English Learner Students: Spotlight on an Overlooked Population.” WestEd, November 2016. p.1. <https://relwest.wested.org/system/resources/236/LTEL-factsheet.pdf?1480559266>



⁷⁷⁶ Bullet points adapted from: Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., p 4.

California, more specifically, defines an LTEL as the following:⁷⁷⁷

[...] an English learner who is enrolled in any of grades 6 to 12, inclusive, who has been enrolled in schools in the United States for 6 years or more, has remained at the same English language proficiency level for 2 or more consecutive prior years, or has regressed to a lower English language proficiency level, as determined by the specified English language development test, or a score determined by the Superintendent of Public Instruction on any successor test, and, for a pupil in any of grades 6 to 9, inclusive, scored far below basic or below basic on the specified English language arts standards-based achievement test, or a score determined by the Superintendent on any successor test.

With these descriptions of LTEL status in mind, it is important to note that many LTELs are fully bilingual, meaning that they have mastered spoken English and sound like native speakers in most cases. However, “they typically have limited literacy skills in their native language, and their academic literacy skills in English are not as well-developed as their oral skills are.”⁷⁷⁸ This means that school systems must employ measures to identify LTELs beyond relying on traditional (or stereotypical) indicators of English language fluency. As the NEA suggests, “LTELs function socially in both English and their home language. However, their language is imprecise and inadequate for deeper expression and communication.”⁷⁷⁹ In general, experts classify LTELs into two primary groups, as illustrated in the following figure

Primary Types of Long-Term English Learners

| | |
|--|---|
|  |  |
| Transnational students who have moved back and forth between the United States and their family's country of origin and have attended school in both countries | Students who have received inconsistent schooling in the United States, moving in and out of bilingual education, English as a second language, and mainstream programs in which they received no language support services |

Source: Menken and Kleyn; “The Difficult Road for Long-Term English Learners”⁷⁸⁰

Regardless of the reason that LTEL students have not reached grade-level proficiency or acquired necessary language skills, **the primary defining characteristic of a LTEL student is that he or she struggles academically, rather than an inability to communicate in English more broadly** (as may be the case with newcomer EL students). These students are not “progressing in English language development as would normatively be expected, and they struggle with the academic work expected of them. Typically, grades plummet, and the general profile of a [LTEL] is a student with a grade point average of less than 2.0.”⁷⁸¹ By Grade 11, some data suggest that most ELs (who at this point are classified as long-term) are “below” or “far below” levels in Algebra I (74 percent) and Language Arts (78 percent).⁷⁸² This points to the fact that LTELs have unique language issues that are often not addressed in standard ESL language programs by the time these students reach later grades – the gaps in performance are usually too wide to overcome using standard means.

The NEA identifies several factors that can contribute to an EL’s transition to long-term status. One such factor includes inappropriate placements in the elementary grades, especially placement in mainstream classes without support for English language development (ELD). When students do receive ELD support,

⁷⁷⁷ “English Language Education: English Learners.” *California Legislature*, October 8, 2015.

http://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB750

⁷⁷⁸ Menken, K. and T. Kleyn. “The Difficult Road for Long-Term English Learners.” *Supporting English Language Learners*, 66:7, April 2009. http://www.ascd.org/publications/educational_leadership/apr09/vol66/num07/The_Difficult_Road_for_Long-Term_English_Learners.aspx

⁷⁷⁹ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.5.

⁷⁸⁰ Adapted from: Menken and Kleyn, “The Difficult Road for Long-Term English Learners,” Op. cit.

⁷⁸¹ Olsen, L. “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learners.” *Californians Together*, 2010. p.21. <http://www.ctdev.changeagentsproductions.org/wp-content/uploads/2015/01/ReparableHarm2ndedition.pdf>

⁷⁸² Ibid.

many schools provide standalone ELD or English as a second language (ESL) classes without strategies to support access to academic content.⁷⁸³

LONG-TERM ENGLISH LEARNERS' CORE EDUCATIONAL NEEDS

ACADEMIC CHALLENGES

Despite the growing LTEL population and the documented need for differentiated supports, “there has been practically no research conducted about them to date, nor do specialized educational programs exist to meet their needs.”⁷⁸⁴ Thus, to develop these kinds of specialized programs, it is imperative that school districts understand why LTELs are struggling academically, even after six or more years in the education system. Most notably, perhaps, LTELs face unique language issues that can impact their academic success. Language issues may cause LTELs to become disengaged from school due to a limited ability to participate in classroom discussion and lack of support for academic success skills.⁷⁸⁵ In total, the NEA finds that LTELs’ different language issues, as compared to traditional EL students, can include the following challenges:⁷⁸⁶

- Even though English tends to be the language of preference for these students, **the majority are “stuck” at intermediate levels of English oral proficiency or below**
- **LTELs lack oral and literacy skills needed for academic success** – they struggle reading textbooks, have difficulty understanding vocabulary, and are challenged by long, written passages
- Because they perform below grade level in reading and writing, and lack academic vocabulary, **they struggle in all content areas that require literacy**
- Despite coming from homes in which a language other than English is spoken, many LTELs use their home language only in limited ways – **fossilized features of their home language are superimposed with English vocabulary** in what is commonly referred to as “Spanglish” or “Chinglish”

Students who have developed conversational English proficiency may still face challenges developing academic English, the more complex language skills needed to participate in academic activities.⁷⁸⁷ These students may also lack academic background knowledge needed for success in secondary-level academic work.⁷⁸⁸ Because ELs do not fully comprehend course content taught in English, LTELs who did not receive sufficient support in previous grade levels may reach the secondary grades with gaps in their knowledge of academic subjects. According to the NEA report, these gaps may be particularly severe for LTELs when schools reduce the instructional time devoted to core subjects such as science and social studies.⁷⁸⁹

While other student subgroups may struggle with the same or similar issues, **LTELs typically reside at the nexus of all these issues in a unique way**, as shown in the figure below. Although their EL profile may look similar to traditional English learners (e.g., based on the California English Language Development Test), for example, “they have spent most or all of their lives in the United States and do not share the newcomer’s unfamiliarity with the culture or lack of exposure to English.”⁷⁹⁰ Likewise, because they struggle academically, their standardized test scores “might look similar to struggling adolescent native speakers [...] yet they are still English learners – with gaps in the basic foundation of the English language.”⁷⁹¹ **This suggests that LTELs will typically need support from a wider range of services to address the varied elements of their status.**

⁷⁸³ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., pp. 9–10.

⁷⁸⁴ Menken, K., T. Kley, and N. Chae. “Spotlight on ‘Long-Term English Language Learners’: Characteristics and Prior Schooling Experiences of an Invisible Population.” *International Multilingual Research Journal*, 6, 2012. p.122. Accessed via Routledge.

⁷⁸⁵ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., p. 6.

⁷⁸⁶ Bullet points adapted from: Ibid., p.5.

⁷⁸⁷ Goldenberg, C. “Teaching English Language Learners What the Research Does—and Does Not—Say.” *American Educator*, Summer 2008. p. 9. <http://www.aft.org/sites/default/files/periodicals/goldenberg.pdf>

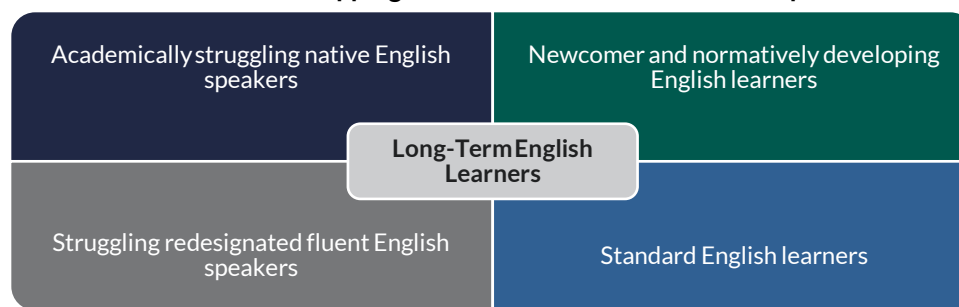
⁷⁸⁸ Olsen, L. “Changing Course for Long Term English Learners.” *Leadership*, 40:2, December 11, 2010. p. 32. Accessed via EBSCOhost

⁷⁸⁹ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., p. 12.

⁷⁹⁰ Olsen, “Repairable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learners,” Op. cit., p.22.

⁷⁹¹ Ibid.

LTEs' Overlapping Characteristics with Other Groups



Source: Californians Together⁷⁹²

SOCIAL DEVELOPMENT

Many LTEs also tend to be non-engaged and passive in schools, leading several sources to refer to these long-term English learners an “invisible group” in schools.⁷⁹³ Due to their challenges with English, and the associated struggle of achieving at grade-level competency levels, many LTEs can be hesitant to participate regularly in classes – indeed, “over years, non-participation becomes a habit for LTEs, and some remain silent for much of the school day.”⁷⁹⁴ Californians Together found that many teachers may *misinterpret this non-engagement*, with focus group participants in one study explaining that many LTEs in their classrooms try not to cause any trouble or “stay under the radar.”⁷⁹⁵ Often, the students themselves do not see their behavior as problematic either. For example,

They say they are being courteous, respectful students. Primarily, they see themselves as “well-behaved” in school. To the surprise of administrators, counselors, and teachers who conducted interviews and focus groups with Long Term English Learners, many said that they enjoy school, do [not] find the work hard, and feel they are being successful students. **A closer look indicates that they do not understand the behaviors associated with academic success and engagement.**⁷⁹⁶

Overall, schools must actively engage LTEs in classes, even if they do not display problem behaviors or obvious signs of language deficiency. This is because, in many instances, “LTEs have not been explicitly taught the study skills or behaviors associated with academic success and engagement. They are passed from grade to grade by educators who do [not] know how to engage them.”⁷⁹⁷

GENERAL PRINCIPLES FOR EDUCATIONAL SUPPORT

Generally, “few districts have formal evidence-based approaches to serving LTEs, particularly with regard to their English language and literacy development.”⁷⁹⁸ However, in recent years, research has started to emerge on how LTEs respond best to school-based programs and intervention initiatives, with many districts across California beginning to “dig deeper” into what is occurring with these students.⁷⁹⁹ This fledgling literature base allows school systems to start making informed decisions about interventions for LTEL students, whereas previously much of this strategic planning was done on an *ad hoc* basis. For example, the

⁷⁹² Figure adapted from: Ibid.

⁷⁹³ [1] Menken, Kleyn, and Chae, Op. cit., p.122. [2] Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.6.

⁷⁹⁴ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.6.

⁷⁹⁵ Olsen, “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learnings,” Op. cit., p.24.

⁷⁹⁶ Ibid. Emphasis added.

⁷⁹⁷ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.6.

⁷⁹⁸ Kinsella, K. “Helping Long-Term English Learners Master the Language of School.” Scholastic, December 2011. p.1. http://research.scholastic.com/sites/default/files/publications/English3D_ResearchFoundation_2011.pdf

⁷⁹⁹ Olsen, “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learnings,” Op. cit., p.31.

NEA and Californians Together now promote **seven basic research-based principles for meeting the needs of LTELs across the board**, including:⁸⁰⁰

- **Urgency:** Focus urgently on accelerating LTEL progress towards attaining English proficiency and closing academic gaps.
- **Distinct Needs:** Recognize that the needs of LTELs are distinct and cannot adequately be addressed within a “struggling reader” paradigm or generic “English Language Learner” approach, but require an explicit LTEL approach.
- **Language, Literacy, and Academics:** Provide LTELs with language development, literacy development, and a program that addresses the academic gaps they have accrued.
- **Home Language:** Affirm the crucial role of home language in a student’s life and learning, and provide home language development whenever possible.
- **Three R’s – Rigor, Relevance, and Relationships:** Provide LTELs with rigorous and relevant curriculum and relationships with supportive adults (along with the supports to succeed).
- **Integration:** End the “ESL ghetto,” cease the sink-or-swim approach, and provide maximum integration without sacrificing access to LTEL supports.
- **Active Engagement:** Invite, support, and insist that LTELs become active participants in their own education.

Experts in the field explain that the above principles can (and should) be applied across contexts for LTELs at all points throughout the needs spectrum. However, actual programs and other initiatives for LTEL students are often tailored more specifically to the school or district profile. Considerations such as the number of LTEL students, school capacity, and trained EL teachers can impact how school systems develop and roll-out LTEL programs.⁸⁰¹ School-, district-, and state-level stakeholders are also encouraged to all take an active role in selecting and preparing these programs and strategies, and hold the responsibilities shown in the figure below. Administrators at all levels need to know which students are LTELs and what supports these students—and their teachers—need to find success.⁸⁰²

Key Responsibilities at Each Stakeholder Level



Source: San Bernardino County Superintendent of Schools⁸⁰³

⁸⁰⁰ Bullet points taken verbatim from: Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., pp.17–18.

⁸⁰¹ Olsen, “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learners,” Op. cit., p.33.

⁸⁰² Olsen, L. and Y. Wan. “A Closer Look at Long Term English Learners: A Focus on New Directions.” *In the Starlight*, 7, December 2010. p.3. http://apps.sbcss.net/elresearch/downloads/07/Olsen_Color_eng.pdf

⁸⁰³ Figure adapted from: Ibid., pp.2–3.

EFFECTIVE INSTRUCTIONAL MODELS FOR LONG-TERM ENGLISH LEARNERS

This section reviews instructional models that can be implemented to support the academic development of LTELs, identifying the advantages and disadvantages to each approach. The following discussion focuses on instructional models recommended by experts in English language instruction and support. These models include ESL pull-out courses, content-based ESL supports in academic courses, and bilingual and dual language instruction.

OVERVIEW OF INSTRUCTIONAL MODELS

According to the NEA, “few districts have designated programs or formal approaches designed for [LTELs] in secondary schools, leaving LTELs to sink or swim with inadequate support.”⁸⁰⁴ In fact, in their survey of over 40 school districts in California, Californians Together found that only four districts had *designated* programs or formal approaches for addressing the needs of LTELs. Instead, the most common approach to helping these students is simply placement in mainstream classrooms designed for English-proficient students, often when “there is nothing about these classes (instruction, pacing, curriculum, grouping) that addresses the language development or access needs of Long Term English Learners.”⁸⁰⁵ Many problems stem from this inappropriate placement, as outlined in the following figure.

Common Problems with LTEL Services in Secondary Schools

Because many LTELs have reached a basic level of oral fluency in English that is sufficient for informal and social communication, their need for support in developing English proficiency is often not recognized.

Secondary school educators often do not know they have LTELs in their classes.

When LTELs struggle academically, they often receive intervention or support classes designed for native English speakers that do not address their needs as English language learners.

In some schools, LTELs may receive English Language Development classes, which tend to be designed for newcomer students, or they may be placed in classes all day with other ELs - none of these approaches is adequate to meet LTELs' needs.

Source: National Education Association⁸⁰⁶

With these gaps in academic programs in mind, instructional models for ELs more generally can be used to help develop a targeted approach to supporting LTELs. Important to note is that these models are broadly classified based on the degree to which students' first language is used in instruction. The figure below provides an overview of primarily **ESL** and **bilingual** instructional models for English learners as identified by Colorín Colorado, a compendium of resources for EL instruction maintained by the public broadcasting station in Washington, D.C. and two national teachers' unions.

⁸⁰⁴ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p. 14.

⁸⁰⁵ Olsen, “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California's Long Term English Learners,” Op. cit., p.27.

⁸⁰⁶ Figure adapted from: Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., pp.14–15.

Overview of Instructional Models for English Learners

| MODEL | DESCRIPTION |
|---|---|
| ESL Programs | |
| ESL Pull-Out | Students spend part of the school day in a mainstream classroom, but are pulled out for a portion of each day to receive instruction in English as a second language. |
| Content-based ESL programs | These programs include structured immersion, sheltered English, and Specially Designed Academic Instruction in English (SDAIE). They all share the goal of teaching English language learners both English language and academic content. Teachers use a variety of strategies – such as the use of gestures, visual aids, and simplified English – so that students can access content. |
| Bilingual Programs | |
| Transitional Bilingual or Early-exit bilingual programs* | These programs are designed to help children acquire the English skills required to succeed in an English-only mainstream classroom. These programs provide some initial instruction in the students' first language, primarily for the introduction of reading, but also for clarification. This method is most common in the early elementary grades, with instruction in the first language usually phased out after two or three years in the program. |
| Maintenance Bilingual or Late-exit programs | These programs, also called developmental, are similar to early-exit programs, but they continue for a longer period of time. Students remain in late-exit programs for several years, often throughout elementary school and continue to receive 40% or more of their instruction in their first language, even when they have been reclassified as fluent-English-proficient. |
| Two-way bilingual programs | Also called paired bilingual and dual language, these programs group English language learners from a single language background in the same classroom with native English speakers. Ideally, there is a nearly 50/50 balance between ELs and native English speakers. Instruction is divided equally between English and the other language. Students serve as native-speaker role models for their peers. Two-way bilingual classes may be taught by a single teacher who is proficient in both languages or by two teachers, one of whom is bilingual. Students remain in these programs throughout elementary school, and in some locations, these programs exist in middle and high schools. |

Source: Colorín Colorado⁸⁰⁷

*Note: Transitional bilingual education programs are typically designed for Grades K-3⁸⁰⁸

A 2016 survey conducted by the National Center for Education Statistics (NCES) finds that instructional methods in which English is the primary language of instruction appear to be more common than bilingual instructional methods. The most common instructional methods include designated ESL classes and push-in or pull-out instruction.⁸⁰⁹ As highlighted in the preceding figure, pull-out support involves removing ELs from the classroom for a period of the day for ESL instruction.⁸¹⁰ Push-in strategies provide similar support within general education classrooms. This support includes activities to make academic content accessible for ELs and to support the acquisition of English language proficiency.⁸¹¹

Schools should ensure that LTELs' instructional placements are appropriate to their needs. In many cases, schools place LTELs in either general education classrooms with insufficient support for English language proficiencies or in ESL classes designed for newcomer students.⁸¹² These ESL classes may include students with a wide range of instructional needs, making it difficult for teachers to serve all students in their classrooms.⁸¹³ Meanwhile, federal civil rights law requires schools to minimize segregation of students based

⁸⁰⁷ Figure contents taken with very minor alterations from: "Instructional Programs for English Language Learners." Colorín Colorado. <http://www.colorincolorado.org/article/instructional-programs-english-language-learners>

⁸⁰⁸ Padilla Flynn, L. "Overview of Bilingual Program Models." Washington Office of the Superintendent of Public Instruction. p. 47. <http://k12.wa.us/MigrantBilingual/pubdocs/WebinarProgramModels.pdf>

⁸⁰⁹ Lewis, L. and L. Gray. "Programs and Services for High School English Learners in Public School Districts: 2015-16. First Look." National Center for Education Statistics, September 2016. p. 6. <https://eric.ed.gov/?q=high+school+english+learners&ft=on&id=ED569187>

⁸¹⁰ "Instructional Programs for English Language Learners," Op. cit.

⁸¹¹ "Connecticut Paraprofessionals' Guide to ELLs." Connecticut State Department of Education. p. 3. http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/cali/paras_brief_ells.pdf

⁸¹² Olsen, "Meeting the Unique Needs of Long Term English Language Learners," Op. cit., pp. 14-15.

⁸¹³ Calderón, M., R. Slavin, and M. Sánchez. "Effective Instruction for English Learners." *The Future of Children*, 21:1, 2011. p. 106. <https://muse.jhu.edu/article/446011/summary>

on EL status and ensure that ELs have the same access to the core curriculum, including advanced courses, as native speakers of English.⁸¹⁴ The Education Commission of the States (ECS) recommends that schools avoid pull-out instructional models, arguing that they prevent ELs from accessing the general education curriculum.⁸¹⁵ In addition, continued placement of LTELs in homogeneous classes of ELs may hinder social inclusion for LTELs.⁸¹⁶ As such, schools should include LTELs in instructional programs with native English speakers to the maximum extent possible. In total, the next figure presents the instructional components of effective school programs to support LTELs.

Components of Successful Programs for LTELs

- Specialized English Language Development course designed for LTELs (separate from other English Language Learners), emphasizing writing, academic vocabulary, active engagement, and oral language
- Clustered placement in heterogeneous and rigorous grade level content classes (including honors and college-track), mixed with English proficient students and taught with differentiated instructional strategies
- Explicit academic language and literacy development across the curriculum
- Primary language literacy development through native speakers classes (in an articulated sequence through Advanced Placement levels)
- Systems for monitoring progress and triggering support and a master schedule designed for flexibility and movement as students progress
- School-wide focus on study skills, metacognition, and learning strategies
- Information and counseling about how students are doing along with discussions about the implications of this data, and testing accommodations
- Inclusive and affirming school climate and relevant texts that speak to the histories and cultures of students

Source: National Education Association⁸¹⁷

ESL PULL-OUT

ESL courses, sometimes referred to as English language development (ELD) courses, often act as the cornerstone to most LTEL initiatives and include courses that *are separate from other classes*. That is, these ELD courses should be designed specifically for long-term English learners, rather than repurposed or grouped with a school's existing EL classes.⁸¹⁸ Often, these courses are developed in conjunction with a district committee or working group that is dedicated to identifying the school system's needs and designing appropriate coursework.⁸¹⁹

ESL pull-out or ELD courses appear to be relatively common among school districts in California. For example, San Francisco Unified School District includes an ESL course for LTELs in its menu of options for ELs, which also includes immersion programs and Specially Designed Academic Instruction in English (SDAIE). A report on ELs prepared by the Education Trust- West notes that the rate of reclassification for LTELs increased substantially in the first year that San Francisco Unified School District offered this course, although this effect may have been due to other changes in reclassification policies which occurred at the same time.⁸²⁰ Likewise, West Covina Unified School District uses an ESL course to support ELs in the secondary grades. Instruction is differentiated to support each student's level of English proficiency, and the course is scheduled as an elective to ensure that students have access to all core courses.⁸²¹

⁸¹⁴ "Schools' Civil Rights Obligations to English Learner Students and Limited English Proficient Parents." U.S. Department of Education Office of Civil Rights. pp. 17–22. <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-el-201501.pdf>

⁸¹⁵ "English Language Learners: A Growing—yet Underserved—student Population." Education Commission of the States, December 2013. p. 5. <https://www.ecs.org/clearinghouse/01/10/20/11020.pdf>

⁸¹⁶ Olsen, "Meeting the Unique Needs of Long Term English Language Learners," Op. cit., pp. 14–15.

⁸¹⁷ Chart contents taken directly from: Ibid., pp. 18–23.

⁸¹⁸ Olsen, "Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators," Op. cit., p.19.

⁸¹⁹ Olsen, "Secondary School Courses Designed to Address the Language Needs and Academic Gaps of Long Term English Learners," Op. cit., p.9.

⁸²⁰ Hahnel, C. et al. "The Language of Reform: English Learners in California's Shifting Education Landscape." The Education Trust - West. p. 22. <https://west.edtrust.org/resource/the-language-of-reform-english-learners-in-californias-shifting-education-landscape/>

⁸²¹ Ibid., p. 23.

Several school districts in California have created ELD or ESL courses that focus specifically on the needs of LTELs.⁸²² These courses typically feature small class sizes consisting exclusively of LTELs and flexible pacing.⁸²³ A 2012 study which examines 38 of these courses through faculty focus groups finds that they include the following key components:⁸²⁴

- A focus on oral language
- A focus on student engagement
- A focus on academic language
- A focus on expository text
- Consistent routines
- Goal setting
- Empowering pedagogy
- Rigor
- Community and relationships
- Study skills

Just as several California school districts have designed these courses specific to LTELs, likewise, the NEA's guide to serving LTELs recommends providing an ESL class specifically for LTELs. This class should focus on academic language, including oral language, writing, and vocabulary.⁸²⁵ The NEA guide also recommends that schools concurrently enroll LTELs in a grade-level ELA class taught by the same teacher as the ESL class. This course should emphasize goal-setting and academic success skills, and include both LTELs and native English speakers. Teachers can incorporate ELD supports aligned with ELA standards to scaffold instruction for LTELs.⁸²⁶ Additional guidelines for implementing ESL or ELD courses from a 2013 review published in the journal *American Educator* are presented in the following figure.

Guidelines for ESL Courses

| CATEGORY | GUIDELINE |
|------------------------------------|--|
| Global Policy Guidelines | Providing ELD instruction is better than not providing it: Relatively strong supporting evidence from EL research |
| | ELD instruction should continue at least until ELs attain advanced English language ability: Based on hypotheses emerging from recent EL research |
| | The likelihood of establishing and sustaining an effective ELD instructional program increases when schools and districts make it a priority: Applicable to ELD but grounded in non-EL or non-ELD research |
| Organizational Guidelines | A separate, daily block of time should be devoted to ELD instruction: Based on hypotheses emerging from recent EL research |
| | English learners should be carefully grouped by language proficiency for ELD instruction, but they should not be segregated by language proficiency throughout the rest of the day: Applicable to ELD but grounded in non-EL or non-ELD research |
| Curricular Focus Guidelines | ELD instruction should explicitly teach forms of English (e.g., vocabulary, syntax, morphology, functions, and conventions): Based on hypotheses emerging from recent EL research |
| | ELD instruction should emphasize academic language as well as conversational language: Based on hypotheses emerging from recent EL research |
| | ELD instruction should incorporate reading and writing, but should emphasize listening and speaking: Based on hypotheses emerging from recent EL research |
| | ELD instruction should integrate meaning and communication to support explicit teaching of language: Based on hypotheses emerging from recent EL research |

⁸²² Olsen, L. "Secondary School Courses Designed to Address the Language Needs and Academic Gaps of Long Term English Learners." Californians Together, 2012. p. 7. <http://www.ctdev.changeagentsproductions.org/wp-content/uploads/2015/01/SecondarySchoolsLTELreport.pdf>

⁸²³ Ibid., p. 25.

⁸²⁴ Bulleted text taken verbatim from: Ibid., pp. 16–20.

⁸²⁵ Olsen, "Meeting the Unique Needs of Long Term English Language Learners," Op. cit., p. 19.

⁸²⁶ Ibid., pp. 19–20.

| CATEGORY | GUIDELINE |
|--------------------------|--|
| Instructional Guidelines | ELD instruction should be planned and delivered with specific language objectives in mind: Applicable to ELD but grounded in non-EL or non-ELD research |
| | Use of English during ELD instruction should be maximized; the primary language should be used strategically: Based on hypotheses emerging from recent EL research |
| | ELD instruction should include interactive activities among students, but they must be carefully planned and carried out: Relatively strong supporting evidence from EL research |
| | ELD instruction should provide students with corrective feedback on form: Based on hypotheses emerging from recent EL research |
| | Teachers should attend to communication and language-learning strategies and incorporate them into ELD instruction: Based on hypotheses emerging from recent EL research |

Source: *American Educator*⁸²⁷

DEVELOPING AN ESL CURRICULUM

A study of university-district partnerships to support ELs in California finds that many schools enroll ELs in ESL classes that substitute for English language arts (ELA) classes. However, **ESL and ELA classes cover substantially different curricula**.⁸²⁸ As shown in Figure 2.5 above, for instance, ESL programs emphasize listening and speaking skills to a greater extent than reading and writing skills.⁸²⁹ As such, ESL classes may not provide the same level of support for grade level literacy skills as ELA classes, and substituting ESL for ELA could prevent students from completing a college preparatory course sequence.⁸³⁰ Districts and schools, then, must decide how LTELs will receive dedicated instruction within the wider curriculum. In a conference in Oakland, Californians Together hosted districts from across the state to discuss the ways that they had implemented this LTEL coursework. Appendix A on pages 182 and 183 presents the full list of “essential components” that districts regularly highlight as being effective across course options. However, beyond these general guidelines, it appears that most districts that pilot programs for LTEL students purchase and/or adopt materials from existing sources (e.g., Scholastic’s *English 3D*).⁸³¹ Considerations for schools that may seek third-party resources—or that wish to develop their own high-quality LTEL curriculum internally—include:⁸³²

- **Materials should be relevant.** Teachers should seek high-interest materials, create units around issues of relevance to students, and pay attention to age and grade-level appropriateness. Students are reluctant to read unless they see the real-life applications.
- **It is important to incorporate whole books.** Typically, LTELs have been given excerpts or simplified material, without the opportunity to read whole books and complex, elegant language.
- **Curriculum should explicitly provide opportunities for active engagement,** with a focus on oral and written language development.
- **The course should touch on all of the essential components** and have materials that address these components (e.g., academic language and vocabulary development, multiple genres of text, etc.).
- **Materials should align and connect** to core English and other academic courses.

⁸²⁷ Chart contents taken directly from: Saunders, W., C. Goldenberg, and D. Marcelletti. “English Language Development: Guidelines for Instruction.” *American Educator*, Summer 2013. p. 23. https://www.aft.org/sites/default/files/periodicals/English_Learners.pdf

⁸²⁸ Umansky, I.M. et al. “Improving the Opportunities and Outcomes of California’s Students Learning English: Findings from School District-University Collaborative Partnerships.” Policy Analysis for California Education, 2015. p. 5. <https://eric.ed.gov/?id=ED562543>

⁸²⁹ Saunders, Goldenberg, and Marcelletti, Op. cit., p. 23.

⁸³⁰ Umansky et al., Op. cit., p. 5.

⁸³¹ Ibid., p.21.

⁸³² Bullet points adapted from: Ibid.

Regardless of how schools select (or develop) these specialized ESL or ELD courses for LTELs, it is important that they address several core content areas. The NEA recommends that all LTEL ESL or ELD classes emphasize **writing, academic vocabulary, active engagement, and oral language**, for example.⁸³³

SCHEDULING CONSIDERATIONS

To ensure that students have access to both ESL and core academic courses, the authors of the ECS study suggest that schools consider extending the school day or year for ELs or integrating ELD into content-area instruction.⁸³⁴ For example, Los Alamitos Unified School District enrolls all ELs in summer school to provide ESL classes.⁸³⁵ Modesto City Schools enrolls LTELs in an additional class period at the end of the school day.⁸³⁶ Similarly, West Covina Unified School District provides after school tutoring in core content areas for ELs. West Covina Unified School District also schedules its ESL course as an elective to ensure that ELs have access to all core academic courses.⁸³⁷

Los Angeles Unified School District offers an ESL course that also carries ELA credit towards the University of California System's entrance requirements. This course provides rigorous academic content designed to be accessible for LTELs and allows LTELs to complete an ESL course without falling behind in course credits.⁸³⁸

A research brief published by the California After School Network suggests using out-of-school-time programs to support ELs. According to this brief, out-of-school-time programs increase opportunities for ELs to practice English language skills and provide a less stressful environment than classroom instruction, which may reduce students' embarrassment over mistakes in English.⁸³⁹

CONTENT-BASED ESL

As will be discussed throughout this section, content-based ESL aligns with research suggesting that separate ESL classes alone suffice to provide ELs with access to an academic curriculum taught in English and that *content-based* ESL support is crucial for meeting LTELs' academic needs.⁸⁴⁰

A NEED FOR CONTENT-BASED LANGUAGE SUPPORT

In school, there are two predominant types of language that are used throughout the day: one that reflects a speaker's ability to hold a conversation about everyday topics, and another that involves talking, reading, and writing about school subjects. As is discussed in Section I, LTELs have typically mastered the former, but often lack the proficiency and/or instructional supports to fully develop the latter.⁸⁴¹ While explicit academic language instruction may not be needed in elementary school—where content does not require as deep a mastery of technical vocabulary—as students progress through middle and high school, this type of language proficiency becomes more and more important for success. “Academic vocabulary” is defined in the following figure.

⁸³³ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.19.

⁸³⁴ Ibid., pp. 11–12.

⁸³⁵ Hahnel et al., Op. cit., p. 19.

⁸³⁶ Olsen, “Secondary School Courses Designed to Address the Language Needs and Academic Gaps of Long Term English Learners,” Op. cit., p. 26.

⁸³⁷ Hahnel et al., Op. cit., p. 23.

⁸³⁸ Klein, A. “For Stalled ELL Students, Graduation Is Often an Elusive Goal.” *Education Week*, 35:30, May 11, 2016. Accessed via EBSCOhost

⁸³⁹ Maxwell-Jolly, J. “English Learners and Out-of-School-Time Programs: The Potential of OST Programs to Foster English Learner Success.” California After School Network, February 2011. p. 2. http://www.afterschoolnetwork.org/sites/main/files/file-attachments/soe_research_brief_0.pdf

⁸⁴⁰ Olsen, “Changing Course for Long Term English Learners,” Op. cit., pp. 9–10.

⁸⁴¹ Soto, M., Y.S. Freeman, and D. Freeman. “In for the Long Haul.” *Language Magazine*. <https://www.languagemagazine.com/in-for-the-long-haul/>

Definition of Academic Vocabulary

Academic vocabulary represents words that are used primarily in the academic disciplines (science, history, geography, mathematics, literary analysis, etc.). These words are much more frequently used in discussions, essays, and articles in these disciplines than in informal conversations and social settings.

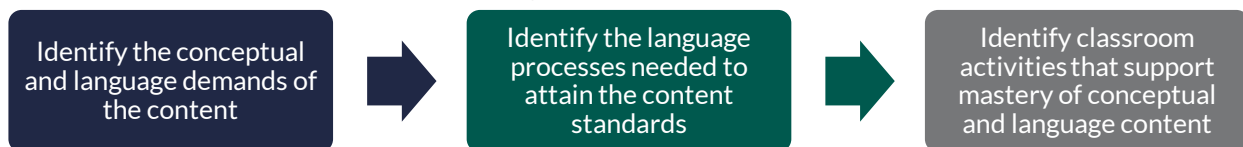
Typically, academic vocabulary is broken into two categories: **general academic vocabulary** and **domain-specific vocabulary**. General academic vocabulary words such as *environment*, *factor*, *exhibit*, *investigate*, *transition*, and *tangential* are used in writing across many academic disciplines. A word's meaning may shift slightly in different contexts, although occasionally the shift is dramatic. By contrast, domain-specific academic vocabulary words are unique to a particular academic discipline. Words such as *pi* and *commutative* are linked to mathematics; words like *diode* and *atom* are linked to physics.

Source: Institute for Education Sciences⁸⁴²

However, many English learners, and especially those who reach middle and high school without reaching proficiency benchmarks, do not have the opportunities to develop academic language to support reading, writing, and discussing academic topics in school. In turn, this lack of exposure “can, and frequently does, lead to struggles with complex texts that are loaded with abstract content and academic vocabulary.”⁸⁴³ **Thus, schools with LTELs should “infuse a language and literacy focus within and across all content areas.** Content-area courses—such as math, science, and social studies—ought to focus simultaneously on content as well as language and literacy learning.”⁸⁴⁴ Because LTELs need to master both academic English and grade level content standards in a short period, instructional strategies that address content and language objectives simultaneously is necessary.⁸⁴⁵

The NEA recommends that schools integrate ELD into all areas of instruction by designing classes for academic language development and incorporating language objectives into each lesson.⁸⁴⁶ Language objectives should include specific language skills that students are expected to master after completion of the lesson, such as comparing two fractions in a math lesson.⁸⁴⁷ The following figure shows a process for developing ELD and academic lesson objectives recommended by a 2014 article in the journal *Social Studies Review*. This article also recommends that teachers differentiate ELD goals for students with varying levels of English proficiency.⁸⁴⁸

Process for Developing ELD and Academic Lesson Objectives



Source: *Social Studies Review*⁸⁴⁹

These strategies may be particularly important after the adoption of the Common Core State Standards (CCSS), which require more complex English language skills.⁸⁵⁰ A 2013 report by the Center for Applied Linguistics notes that the CCSS embed language and literacy instruction in all content areas, meaning that

⁸⁴² Baker, S. et al. “Teaching Academic Content and Literacy to English Learners in Elementary and Middle School.” Institute for Education Sciences, April 2014. p.14. https://ies.ed.gov/ncee/wwc/Docs/practiceguide/english_learners_pg_040114.pdf

⁸⁴³ *Ibid.*, p.13.

⁸⁴⁴ Ascenzi-Moreno, Kleyn, and Menken, Op. cit., p.6.

⁸⁴⁵ Silva, M.M. and M. Muñoz. “Scaffolding Academic Skills for the Long-Term English Learner’s Advancement.” *California English*, 17:2, Winter 2011. p. 10. Accessed via EBSCOhost

⁸⁴⁶ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., p. 21.

⁸⁴⁷ Duguay, A. et al. “Implementing the Common Core for English Learners: Responses to Common Questions.” Center for Applied Linguistics., September 2013. p. 5. <https://pdfs.semanticscholar.org/0bdf/504f12dfa6fc7e9e87d220b0b5d14cc40881.pdf>

⁸⁴⁸ Sharken Taboada, D. “Integrated English Language Development in the History Classroom.” *Social Studies Review*, 53, January 2014. p. 22. Accessed via EBSCOhost

⁸⁴⁹ Chart contents adapted from: *Ibid.*, p. 21.

⁸⁵⁰ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., p. 31.

teachers of subjects other than ELA need to integrate ELD skills into instruction. The CCSS may also require ELA teachers to incorporate more nonfiction texts into their curricula, especially at the high school level.⁸⁵¹ The Center for Applied Linguistics recommends that content area classes focus on academic language embedded in specific performance tasks and text selections.⁸⁵²

The California State Board of Education has created a detailed framework which aligns ELD and ELA standards for Grades K-12.⁸⁵³ In addition, a report by the Understanding Language Initiative identifies several areas of alignment between ELD needs and the CCSS.⁸⁵⁴ The following figure presents strategies recommended by the Understanding Language Initiative to support ELs in each strand of the CCSS ELA standards.

Suggested Strategies to Support ELs in the CCSS

| STRAND | SUGGESTED STRATEGIES |
|---------|---|
| Reading | <ul style="list-style-type: none"> ▪ Induce readers to consider (or even research) the topic at hand using more accessible texts (including those in a students' L1 for ELs who read in their first languages) in preparation for reading more difficult texts as part of the same lesson or unit. ▪ Assist readers in deciding which words in a given text are critical for particular uses of the text and which can be skipped. ▪ Focus readers' attention on meaning-critical grammatical structures ▪ Build on and expand readers' knowledge about how different kinds of texts are structured. ▪ Focus readers' attention on specific features of text complexity by choosing authentic and original texts that emphasize one or two features at a time (such as a linguistically more accessible text that features multiple meanings, a lexically dense piece with a simpler grammatical structure, or a text in the students' native language that includes the challenging text structures of an unfamiliar genre). ▪ Integrate a focus on vocabulary-building with meaningful activities centered around texts. |
| Writing | <ul style="list-style-type: none"> ▪ Maximize the use of ELs' existing linguistic and cultural resources by ensuring that students have meaningful ideas to write about, allowing them to use their home languages or varieties of language during the writing process, employing technology that students already use, and drawing upon their background knowledge, practices, and experiences. ▪ Provide ELs with meaningful exposure to texts they will be writing, guiding students through the linguistic and rhetorical patterns found in different genres. ▪ Ensure that writing instruction creates meaningful opportunities to communicate rather than mechanical exercises for text production. These opportunities include interactions with peers and teachers about ELs' writing and sensitive yet substantive feedback about the content of their writing at multiple points throughout the writing process. ▪ Encourage students with L1 literacy backgrounds to draw upon this resource to help them locate, evaluate, and analyze information. ▪ Assist students in selecting reading and drafting strategies appropriate for varied research tasks. ▪ Provide explicit guidance on the conventions of textual ownership and citations in U.S. academic settings, alongside clear yet critical explanations of the purposes these conventions serve. ▪ Create opportunities that allow ELs to participate in teacher-guided and collaborative endeavors before attempting research independently. |

⁸⁵¹ Duguay et al., Op. cit., pp. 2-3.

⁸⁵² Ibid., pp. 5-6.

⁸⁵³ "English Language Arts/English Language Development Framework for California Public Schools: Kindergarten through Grade Twelve." California State Board of Education, July 2014.
<https://www.mydigitalchalkboard.org/cognoti/content/file/resources/documents/ac/ac1376ba/ac1376ba78a91e80241cb0e458caaa57310d0763/elaeldfmwfeb17.pdf>

⁸⁵⁴ Bunch, G.C., A. Kibler, and S. Pimentel. "Realizing Opportunities for English Learners in the Common Core English Language Arts and Disciplinary Literacy Standards." Understanding Language Initiative. http://ell.stanford.edu/sites/default/files/pdf/academic-papers/01_Bunch_Kibler_Pimentel_RealizingOpp%20in%20ELA_FINAL_0.pdf

| STRAND | SUGGESTED STRATEGIES |
|------------------------|---|
| Speaking and Listening | <ul style="list-style-type: none"> Engage students in individual, small group, and whole-class discussions that move beyond traditional initiation-response-evaluation structures to “bridging discourses” that encourage ELs to produce extended oral discourse and engage with academic registers. Develop collaborative tasks that require effective and linguistically rich discussions. Allow ELs to collaborate in their home languages as they work on tasks to be completed in English. Teach ELs strategies for using their still-developing English language proficiency to engage in different communicative modes. For example, listening comprehension activities can help ELs to “arrive successfully at a reasonable interpretation of extended discourse,” rather than to process every word literally, which is impossible even for native English speakers to do. |

Source: Understanding Language Initiative⁸⁵⁵

INSTRUCTIONAL SCAFFOLDS

Sheltered instruction models support ELs in general education classrooms through scaffolded instructional supports. A guide to EL instruction prepared for school districts in Connecticut recommends the instructional supports shown in the next figure for ELs in the secondary grades. These supports include strategies to support the development of English literacy skills as well as strategies to increase student engagement.

Recommended Instructional Supports for ELs in the Secondary Grades

- Integrate all four language skills into instruction from the start (reading, writing, listening, speaking)
- Teach the components and processes of reading and writing; beginning with phonemic awareness and phonics and adding vocabulary, text comprehension and fluency
- Provide explicit vocabulary instruction as a regular part of classroom lessons, providing opportunities for exposure and use in multiple contexts and in different linguistic modes such as discussion, reading, and writing. For ELs, teachers may also need to distinguish between content specific words, process words, and words related to English structure
- Provide direct and explicit instruction in comprehension strategies with opportunities for guided practice.
- Provide opportunities for extended discussion of text meaning and interpretation by asking follow-up questions that provided continuity and extend the discussion; introduce and use a specific —discussion protocol.
- Increase student motivation and engagement in literacy learning by making literacy experiences relevant, connected to everyday life, and, for ELL students in particular, that connect to their prior experiences. For example, include folktales from the student’s background when appropriate.
- Make available intensive individualized interventions for struggling readers (based on reliable screening assessments) provided by qualified teachers.
- Build and activate background knowledge.
- Teach language through content and themes, linking language to real-life experiences, including the content or themes being taught in other classes.
- Use native language strategically
- Pair technology with existing interventions.
- Motivate ELs through choice: Most students tend to be more motivated and more successful in reading when they have meaningful opportunities to exercise choice, whether that means choice of text, choice of task, or choice of partner.

Source: Connecticut Administrators of Programs for English Language Learners⁸⁵⁶

Research also identifies specific instructional strategies and scaffolds that can support ELs in acquiring content-area literacy. The following figure shows strategies recommended by a 2008 article in the journal *American Educator*. Notably, these strategies include strategic use of students’ first language, such as previewing and reviewing content.

⁸⁵⁵ Chart contents taken verbatim with modification from: Ibid., pp. 4, 6–7.

⁸⁵⁶ Figure contents taken directly from: “A Resource Guide for Low Incidence ELL Districts.” Connecticut Administrators of Programs for English Language Learners, September 2010. pp. 20–21. <http://capellct.org/documents/Combined.pdf>

Research-Supported Literacy Supports for ELs

- Using texts with content that is already familiar to ELs
- Explicit instruction in vocabulary
- Previewing instruction in students' first language before an English-language lesson and then reviewing content in students' first language after the lesson
- Instructional scaffolds including:
 - Visual aids such as diagrams and schedules to support classroom routines
 - Graphic organizers to visualize relationships among contents
 - Opportunities for additional practice during or after the school day
 - Redundant sources of key information such as visual cues and physical gestures
 - Highlighting and clarifying difficult vocabulary terms or passages in texts
 - Summarizing and paraphrasing texts
 - Providing additional opportunities for practice in reading words, sentences, and passages
 - Providing additional opportunities for interaction with teachers and peers
 - Adjusting instruction and expectations based on students' English-language proficiency
 - Including content and English language objectives in each lesson
- Separate assessments of English language skills and content knowledge; and
- Providing additional learning time through after-school programs, extending the school day or year, summer school programs, or giving ELLs additional time to earn a diploma.

Source: *American Educator*⁸⁵⁷

SPECIALLY DESIGNED ACADEMIC INSTRUCTION IN ENGLISH

A 2010 article in the journal *Leadership* recommends using the specially designed academic instruction in English (SDAIE) protocol to provide instructional support for LTELs in content-area courses.⁸⁵⁸ In a similar vein, the 2014 NEA report identifies SDAIE as a key support for LTELs enrolled in grade-level content courses.⁸⁵⁹ SDAIE is an adaptation of the sheltered English instructional model that increases access to the core curriculum.⁸⁶⁰ SDAIE provides instructional scaffolds designed to support academic understanding, such as visual or manipulative representations of content. SDAIE also includes cooperative group work and learning scaffolds that use students' first languages.⁸⁶¹ A 2011 report published by the Center for Multilingual, Multicultural Research at the University of Southern California recommends that SDAIE programs include the characteristics shown in the following figure.

⁸⁵⁷ Figure contents adapted from: Goldenberg, Op. cit., pp. 18–21.

⁸⁵⁸ Olsen, "Changing Course for Long Term English Learners," Op. cit., p. 32.

⁸⁵⁹ Olsen, "Meeting the Unique Needs of Long Term English Language Learners," Op. cit., p. 20.

⁸⁶⁰ Genzuk, M. "Specially Designed Academic Instruction in English (SDAIE) for Language Minority Students." Center for Multilingual, Multicultural Research, University of Southern California, 2011. p. 9. <http://www2.csudh.edu/tsr/assets/genzuk-sdaie-2011.pdf>

⁸⁶¹ Moughamian, A.C., M.O. Rivera, and D.J. Francis. "Instructional Models and Strategies for Teaching English Language Learners." Center on Instruction, 2009. pp. 14–15. <http://eric.ed.gov/?id=ED517794>

Desirable Characteristics in Implementing SDAIE

- Cooperative and thematic learning environments;
- Teacher delivery that contextualizes content using comprehensible input and uses techniques such as rephrasing and paraphrasing;
- A variety of interactive strategies including student to student, student to teacher, student to text, and student to self (reflection, self-evaluation);
- Careful planning of the environment, instruction, and materials;
- Identification and selection of focus concepts that integrate student learning;
- Facilitating a connection of focus concepts to students' experiences, knowledge, and needs to know;
- Selection of scaffolds to assist students' engagement and performance (social-affective, linguistic, cognitive-academic, metacognitive-metalinguistic);
- Continuous observation, monitoring, and assessment leading to teachers' modifications of instructional procedures and to students' increasing autonomy;
- Encourage free voluntary reading and the use of fiction across the curriculum to supplement related subject matter teaching.
- Multicultural development and awareness and the validation of diversity.

Source: Center for Multilingual, Multicultural Research, University of Southern California⁸⁶²

SDAIE develops students' literacy skills in their first language to support transfer of these skills to English.⁸⁶³ The Center for Multilingual, Multicultural Research report recommends that SDAIE classes include instructional materials in students' first language as well as support from teachers or paraprofessionals who are fluent in students' first language. This report also recommends grouping students in SDAIE classes by English language proficiency.⁸⁶⁴ A 2013 report by the Center for Applied Linguistics recommends the following specific strategies to support students' first languages in primarily English-language instruction:⁸⁶⁵

- Have students preview content in their first language before reading a passage or hearing a lecture in English
- Have students summarize or respond to a reading passage in their first language
- Encourage students to use their first language to discuss content with their classmates or to draft their ideas
- Have students complete some or all assignments related to content in their first language
- Identify a bilingual teacher, peer, or paraprofessional to help a student by translating key information
- Invite parent volunteers to record books in the first language for listening centers and then have students retell the stories in English
- Ask students to use their home language to complete the prior knowledge (K) column of a KWL chart in their home language and the information learned column (L) at the end of the unit in English
- Have students read primary sources in their first language and take notes in English

⁸⁶² Figure taken directly from: Genzuk, Op. cit., p. 10.

⁸⁶³ Ibid., pp. 10–11.

⁸⁶⁴ Ibid., p. 11.

⁸⁶⁵ Bulleted text taken verbatim from: Duguay et al., Op. cit., pp. 16–17.

BILINGUAL OR DUAL LANGUAGE INSTRUCTION

As a result of the passage of Proposition 58 in 2016, school districts in California can replace English-only instruction for ELs with bilingual or dual language instruction that uses ELs' first language.⁸⁶⁶ The following figure shows bilingual instruction options available to school districts in California under Proposition 58.

Bilingual Instruction Options in California

| INSTRUCTION OPTION | DESCRIPTION |
|--|--|
| Dual Language or Two-Way Immersion Programs | Provide instruction for both ELs and native English speakers with the goal of developing academic skills and proficiency in both English and ELs' first language |
| Transitional and Developmental Programs | Provide instruction for ELs that strategically uses both English and ELs' first language to develop literacy and academic skills |
| Structured English Immersion Programs | Provide instruction for ELs that relies primarily on English but uses strategic supports in ELs' first language |

Source: California School Boards Association⁸⁶⁷

Research suggests that bilingual instruction may be more effective than instruction that relies exclusively on English. A 2014 review of previous research published in the *American Educational Research Journal* finds "a significant small to moderate benefit of two-language instruction for English learners on English literacy outcomes," although this review does not focus exclusively on studies of long-term ELs or students in the secondary grades.⁸⁶⁸ In addition, some research finds that bilingualism improves other cognitive skills such as problem-solving, memory, and reading.⁸⁶⁹

Bilingual instruction may support literacy skills by facilitating the transfer of skills from students' first language to English, a phenomenon known as linguistic transfer.⁸⁷⁰ A 2011 meta-analysis examines 47 previous studies of correlations between literacy skills in two languages and finds strong average correlations for a variety of literacy and oral language skills.⁸⁷¹ Bilingual instruction may also support the ability to think abstractly about properties of language, referred to as metalinguistic awareness.⁸⁷²

However, bilingual instructional programs may require a substantial investment of resources due to the need to train or hire bilingual staff. Teachers with formal bilingual credentials enjoy a number of advantages, including familiarity with students' home cultures, that enables them to build on students' assets during instruction and communicate more effectively with parents.⁸⁷³ However, the number of teachers with bilingual certifications in California declined substantially during the period when California did not permit bilingual education, which may result in unmet demand for teachers with bilingual certification as districts in the state consider implementing bilingual programs. In order to address this need, a California School Boards

⁸⁶⁶ "California Proposition 58 — Repeal English-Only Education — Results: Approved." *The New York Times*, February 10, 2017. p. 58. <http://www.nytimes.com/elections/results/california-ballot-measure-58-repeal-english-only-ed>

⁸⁶⁷ Chart contents adapted from: Buenrostro, M. "English Learners in Focus, Issue 4: Expanding Bilingual Education in California after Proposition 58." California School Boards Association Governance Brief. p. 2. https://www.csba.org/GovernanceAndPolicyResources/StudentAchievement/~/_media/CSBA/Files/GovernanceResources/GovernanceBriefs/201703GBEnglishLearnersInFocusIssue4_Prop58.ashx

⁸⁶⁸ Umansky, I.M. and S.F. Reardon. "Reclassification Patterns Among Latino English Learner Students in Bilingual, Dual Immersion, and English Immersion Classrooms." *American Educational Research Journal*, October 1, 2014. p. 883. <http://journals.sagepub.com/stoken/rbtf/xpuEp7WkeX43s/full>

⁸⁶⁹ "English Learners in Focus, Issue 2: The Promise of Two-Way Immersion Programs." California School Boards Association Governance Brief, September 2014. p. 4. https://www.csba.org/GovernanceAndPolicyResources/StudentAchievement/~/_media/CSBA/Files/GovernanceResources/GovernanceBriefs/201409GBEnglishLearnersInFocusIssue2_DualImmersion.ashx

⁸⁷⁰ Ibid.

⁸⁷¹ Melby-Lervåg, M. and A. Lervåg. "Cross-Linguistic Transfer of Oral Language, Decoding, Phonological Awareness and Reading Comprehension: A Meta-Analysis of the Correlational Evidence." *Journal of Research in Reading*, 34:1, February 2011. pp. 117, 121–215. Accessed via EBSCOhost

⁸⁷² Friesen, D.C. and E. Bialystok. "Metalinguistic Ability in Bilingual Children: The Role of Executive Control." *Rivista Di Psicolinguistica Applicata*, 12:3, 2012. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4000604/>

⁸⁷³ "English Learners in Focus, Issue 2: The Promise of Two-Way Immersion Programs," Op. cit., p. 5.

Association (CSBA) brief recommends that school districts work to recruit teachers from linguistically diverse backgrounds and provide professional development focused on bilingual instruction for current teachers.⁸⁷⁴

Where bilingual instructional programs are not feasible, schools can support bilingualism by offering language development courses in LTELs' first language which lead to opportunities for Advanced Placement credit. The NEA guide recommends that these courses emphasize literacy skills aligned to ELA standards. Schools can accommodate students whose first languages are not common enough to support language development courses through online courses or elective courses that use students' first language, such as drama or journalism.⁸⁷⁵

DUAL LANGUAGE IMMERSION

Dual language immersion appears to be more commonly applied at the secondary level than developmental or structured immersion. Dual language immersion in the secondary grades typically uses a 50:50 model in which instruction is evenly divided between English and the target language.⁸⁷⁶ The figure below presents instructional strategies to support dual language immersion recommended in a 2014 brief by the CSBA.

Recommended Instructional Strategies for Dual Language Immersion

- Social interactions in instruction that are equitable between the two languages
- Reciprocal (interactive) rather than transmission (lecture) approaches
- Cooperative learning strategies that are well-planned and monitored to ensure interactions that enhance language development
- Slower, simplified and repetitive speech when students are at the early stages of proficiency
- Techniques to check and confirm comprehension
- Contextual clues and visual aids
- Gestures and modeling

Source: California School Boards Association⁸⁷⁷

In addition to the overall advantages of bilingual instruction, dual language immersion programs may improve school climate. Because dual language immersion intentionally includes ELs and native speakers of English in the same classrooms, dual language immersion may promote social inclusion for LTELs. According to the CSBA, "the integration of students from different cultural and linguistic backgrounds in two-way immersion contributes to socializing young people toward a lifelong broader understanding and tolerance of California's diverse population."⁸⁷⁸

ADDITIONAL SUPPORT SERVICES

In this section, Hanover reviews additional support services that schools can use to improve LTELs' academic achievement and educational experiences. This section begins with a discussion of home language literacy supports and strategies for creating inclusive school environments. It then concludes with a review of family engagement and professional development practices districts can implement for key stakeholders whose efforts are critical for supporting English learners.

SUPPORTS FOR HOME LANGUAGE LITERACY DEVELOPMENT

While the ESL and bilingual models discussed above form the core of EL support, when possible, schools should aim to provide opportunities for English learners to enroll in courses in their home language. Home language literacy development has many benefits for LTELs, and there is no evidence that it detracts from

⁸⁷⁴ Buenrostro, Op. cit., p. 4.

⁸⁷⁵ Olsen, "Meeting the Unique Needs of Long Term English Language Learners," Op. cit., p. 21.

⁸⁷⁶ "English Learners in Focus, Issue 2: The Promise of Two-Way Immersion Programs," Op. cit., p. 2.

⁸⁷⁷ Chart contents taken directly from: Ibid., p. 3.

⁸⁷⁸ Ibid., p. 4.

proficiency gains in English – in fact, experts suggest that gains in home language literacy can positively influence English language development as well.⁸⁷⁹ However, in one qualitative study of three high schools in New York City with high LTEL populations, experts in the field found that most LTEL schooling “has largely been subtractive, with English being taught and developed instead of [students’] native languages.”⁸⁸⁰ The researchers go on to summarize:

As a result, the students in our sample have not been able to experience the academic benefits that come when their native languages are developed in schools, because they do not have the advantage of a strong academic literacy foundation established in their native language upon which to build as they acquire English. This is part and parcel of their experiences moving in and out of bilingual education, ESL, and mainstream classrooms, which, **when taken together, have prolonged the length of time it takes these students to acquire sufficient academic English to succeed in school.**⁸⁸¹

To ensure that LTELs receive this beneficial home language support, schools can offer LTELs the opportunity to develop their native languages “in programs with clear and consistent language policies, which seek to develop bilingualism and biliteracy.”⁸⁸² However, this relies, again, on schools **explicitly teaching academic literacy skills to LTELs rather than assuming they enter high school already proficient.** In general, home language (or native speaker) classes should be articulated and provide solid preparation and a pathway into Advanced Placement (AP) coursework. The articulated courses need to “be designed for native speakers, and include explicit literacy instruction aligned to the literacy standards in English and designed for skill transfer across languages.”⁸⁸³

For more commonly spoken languages, such as Spanish or Mandarin, creating this pathway may simply mean reworking existing courses to meet the needs of native speakers. However, it is not generally feasible to create native language development classes for LTELs of less common languages. In these cases, schools can help students select “language-based electives” such as drama or journalism, in which there is some freedom and flexibility to work in other languages.⁸⁸⁴ Alternatively, schools can develop afterschool programs through community partnerships with local heritage organizations to help these students develop home language skills.⁸⁸⁵

CREATING INCLUSIVE SCHOOL CLIMATES

Just as schools must continually provide instruction in language development and content-based support, it is the responsibility of individual schools and teachers to create an affirming, inclusive environment for LTELs. Not only does a welcoming school climate help LTELs feel more comfortable, but it also helps them to engage more fully in school participation. This, in turn, can lead to “healthy identity development and positive intergroup relationships.”⁸⁸⁶ **Often, educators can leverage classroom structures and resources to enhance the school climate and limit any social isolation by facilitating relationship-building across peer groups.** These include, for example:⁸⁸⁷

- Group students flexibly considering language and content proficiency
- Embed opportunities for structured oral language development (public speaking, presentations, role play, sentence frames)

⁸⁷⁹ Menken and Kleyn, “The Difficult Road for Long-Term English Learners,” Op. cit.

⁸⁸⁰ Menken, K. and T. Kleyn. “The Long-Term Impact of Subtractive Schooling in the Educational Experiences of Secondary English Language Learners.” *International Journal of Bilingual Education and Bilingualism*, 13:4, July 2010. p.412.

<https://katemenken.files.wordpress.com/2011/10/menken-kleyn-ijbeb-134-july-2010-subtractive-schooling-ltel1.pdf>

⁸⁸¹ Ibid, p.413. Emphasis added.

⁸⁸² Ibid.

⁸⁸³ Olsen, “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learners,” Op. cit., p.35.

⁸⁸⁴ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.21.

⁸⁸⁵ Olsen, “Reparable Harm: Fulfilling the Unkept Promise of Educational Opportunity for California’s Long Term English Learners,” Op. cit., p.35.

⁸⁸⁶ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.23.

⁸⁸⁷ Bullet points adapted from: Ascenzi-Moreno, Kleyn, and Menken, Op. cit., pp.11–12.

- Build spaces for students to create and reflect upon short- and long-term goals
- Discuss the “how’s” of being a successful student – e.g., study skills, note taking, planning;
- Provide curricular materials that are connected to students’ backgrounds and interests;
- Offer books for free reading that are of interest to students
- Make use of technology as a tool for background and content knowledge as well as demonstrated learning
- Provide a text-rich multilingual landscape with academic language and models for mentor text/work

Many of these activities are designed to facilitate student choice and reflect a wider range of perspectives. Teachers can further use texts and other curricular materials that address the history and culture of LTEL students for whole-class lessons, and schools can diversify extracurricular and club activities to include an international focus or offer multicultural elective options.⁸⁸⁸

ENGAGING FAMILIES

Schools should engage in outreach that targets families of LTELs. Because LTELs have typically mastered conversational English, parents may not realize that their children’s proficiency in academic English is limited. Communications with parents of LTELs should explain the reclassification process in terminology that parents can understand. A 2017 article in the journal *Communique* suggests that schools prepare specialized progress reports for parents of LTELs which discuss their child’s progress towards reclassification.⁸⁸⁹

Schools may also need to adjust communications strategies for parents with limited English proficiency (LEP). Federal civil rights law requires schools to identify LEP parents and provide information in a language that families understand. Schools can use home language surveys to identify LEP parents and their first languages.⁸⁹⁰ A 2013 article in the professional publication *Teaching Tolerance* recommends the following communications strategies for LEP families:⁸⁹¹

- Develop a written communications plan to ensure timely and effective communication with LEP parents.
- Maintain a list of LEP parents who require languages other than English and make this list available to all staff members.
- Notify LEP parents annually that free translation and interpretation services are available and explain how to request these services. A multi-language poster by the office explaining the resources available to LEP families can simplify communication.
- Provide free interpretation and translation services to LEP parents at parent-teacher conferences, meetings with the school principal and special education meetings.
- All parent notices (e.g., registration/ enrollment forms, emergency notification cards, report cards, bus schedules, field trip permission forms, privacy policies and class schedules) should include appropriate translations.

⁸⁸⁸ Olsen, “Meeting the Unique Needs of Long Term English Language Learners: A Guide for Educators,” Op. cit., p.23.

⁸⁸⁹ Bermúdez, C., T. Kanaya, and M. Santiago. “Improving Family–School Communication with Parents of Long-Term English Learners.” *Communique*, 45:8, June 2017. pp. 14–15. Accessed via EBSCOhost

⁸⁹⁰ “Information for Limited English Proficient (LEP) Parents and Guardians and for Schools and School Districts That Communicate with Them.” U.S. Department of Justice Civil Rights Division and U.S. Department of Education Office for Civil Rights. <https://www2.ed.gov/about/offices/list/ocr/docs/dcl-factsheet-lep-parents-201501.pdf>

⁸⁹¹ Bulleted text taken verbatim from: “Found in Translation: A Teaching Tolerance Guide.” *Teaching Tolerance*, Spring 2013. p. 33. http://www.tolerance.org/sites/default/files/general/Found_in_Translation.pdf

- Train staff to effectively communicate with LEP parents—when and how to obtain qualified language assistance, use of interpreters when staff receive or make calls to language-minority individuals, and applicable recordkeeping procedures.

The U.S. Department of Education’s toolkit for ELs notes that developing strong relationships with LEP families involves a substantial investment of time, and may require schools to provide translation or interpretation services.⁸⁹² The following figure shows engagement strategies for ELs recommended by Colorín Colorado.

Engagement Strategies for Families of ELs

| THEME | STRATEGIES |
|--|--|
| Connection with EL Families | <ul style="list-style-type: none"> ■ Learn about the school’s EL population ■ Integrate cultural traditions of EL families throughout the school ■ Create a welcoming environment for families ■ Make a personal connection with families ■ Show that the school values families’ native language |
| Communicating Important Information | <ul style="list-style-type: none"> ■ Find ways to communicate with EL parents ■ Make the enrollment process manageable for EL parents ■ Make the enrollment process accessible throughout the year ■ Provide opportunities for parents to learn more about important topics |
| Parent Participation | <ul style="list-style-type: none"> ■ Look for ways that EL parents can help with students’ schoolwork ■ Look for ways for EL parents to participate and volunteer ■ Think outside the box about parent involvement ■ Look for the successes ■ Consider scheduling and location alternatives |
| Parents as Leaders | <ul style="list-style-type: none"> ■ Encourage EL parents to take on leadership roles ■ Look for ways to make parent leadership more sustainable |
| Community Partnerships | <ul style="list-style-type: none"> ■ Build partnerships with the local community ■ Build relationships with local neighbors |

Source: Colorín Colorado⁸⁹³

STAFF PROFESSIONAL DEVELOPMENT

Regardless of the instructional model used and the supports provided, classroom teachers need specific skills and dispositions to develop literacy skills in ELs.⁸⁹⁴ A 2012 report by the Center for American Progress suggests that all teachers need to be able to support ELs’ development of oral language skills, explicitly teach academic language skills, and convey support for cultural diversity.⁸⁹⁵ The figure below demonstrates characteristics of effective teachers of LTELs identified in the 2014 NEA report.

⁸⁹² “Tools and Resources for Ensuring Meaningful Communication with Limited English Proficient Parents.” U.S. Department of Education. p. 2. <https://www2.ed.gov/about/offices/list/oela/english-learner-toolkit/chap10.pdf>

⁸⁹³ Chart contents taken with minor alterations from: Breiseth, L., K. Robertson, and S. Lafond. “A Guide for Engaging ELL Families: Twenty Strategies for School Leaders.” Colorín Colorado, August 2011. p. 2. <https://neusha.org/student/programs/attachments/GuideforengagingELLfamilies.pdf>

⁸⁹⁴ “English Language Learners: A Growing—yet Underserved—student Population,” Op. cit., p. 4.

⁸⁹⁵ Samson, J.F. and B.A. Collins. “Preparing All Teachers to Meet the Needs of English Language Learners: Applying Research to Policy and Practice for Teacher Effectiveness.” Center for American Progress, 2012. p. 11. <https://eric.ed.gov/?id=ED535608>

Characteristics of Effective Educators of LTELs

- Effective educators know their students and identify their Long-Term English Language Learners.
- Effective educators emphasize oral language and active engagement.
- Effective educators provide explicit instructions and models.
- Effective educators focus on the development of academic reading and writing skills.
- Effective educators focus on key cognitive and language functions required for academic tasks and use graphic organizers to scaffold those functions.
- Effective educators build background knowledge, scaffold key concepts, and teach vocabulary.
- Effective educators make connections, build relevance, affirm language and culture, and maintain rigor.
- Effective educators check for understanding and monitor progress.

Source: National Education Association⁸⁹⁶

However, research suggests that many teachers do not develop these skills and dispositions in teacher preparation programs.⁸⁹⁷ The 2014 NEA report notes that lack of professional development contributes to inconsistent practices across schools, and that many teachers in the secondary grades do not receive training focused on ELD or instruction in reading and writing skills.⁸⁹⁸ The 2013 Center for Applied Linguistics report notes that teachers may need professional development to support the integration of language and literacy skills into content area instruction.⁸⁹⁹

The Education Trust – West’s report on ELs finds that school districts with strong outcomes for ELS provide job-embedded professional development to all teachers which focuses on ELD and academic content standards and includes dedicated time for teacher collaboration.⁹⁰⁰ The 2014 NEA report recommends providing professional development focused specifically on SDAIE.⁹⁰¹ A 2011 brief policy brief published by the NEA recommends that professional development for general education teachers of ELs include:⁹⁰²

- A process for establishing high standards for English language acquisition, English language development, and academic content in lesson planning and instruction
- A process for integrating teachers’ understanding of academic content and English-language proficiency standards with instruction in teaching methods and assessments
- Knowledge and use of effective pedagogy
- Methods for implementing instructional strategies that ensure that academic instruction in English is meaningful and comprehensible
- Exposure to a demonstration showing how to implement strategies that simultaneously integrate language acquisition, language development, and academic achievement
- Exposure to a demonstration showing why increasing academic achievement of ELLs is dependent upon multiple instructional approaches or methodologies
- Providing a “strategies toolkit” for teachers, which offers ways to enhance and improve instruction for struggling students, based on assessment results

Several districts in California offer professional development opportunities to assist teachers working with ELs. To support the integration of ELD into academic instruction, Calipatria Unified School District provides

⁸⁹⁶ Chart contents taken directly from: Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., pp. 24–28.

⁸⁹⁷ “English Language Learners: A Growing—yet Underserved—student Population,” Op. cit., p. 4.

⁸⁹⁸ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., pp. 11, 15.

⁸⁹⁹ Duguay et al., Op. cit., p. 2.

⁹⁰⁰ Hahnel et al., Op. cit., p. 24.

⁹⁰¹ Olsen, “Meeting the Unique Needs of Long Term English Language Learners,” Op. cit., p. 21.

⁹⁰² Bulleted text taken verbatim from: “Professional Development for General Education Teachers of English Language Learners.” National Education Association, 2011. p. 3. https://www.nea.org/assets/docs/PB32_ELL11.pdf

all teachers with professional development focused on ELD strategies.⁹⁰³ Los Alamitos Unified School District, which uses an English immersion instructional model, provides all new teachers a five-year sequence of professional development focused on instructional supports for ELs. This professional development relies on coaching delivered by teachers released from classroom duties.⁹⁰⁴ Districts participating in the 2012 study of ESL classes for LTELs used school-wide professional development models such as the Sheltered Instruction Observation Protocol (SIOP) and the Constructing Meaning program.⁹⁰⁵

APPENDIX A: DESCRIPTIONS OF ESSENTIAL COMPONENTS OF DEDICATED LTEL CLASS

This appendix describes the essential components of a LTEL classroom, as described by Californians Together. These elements were drafted during a statewide conference of school districts across the state with dedicated LTEL programs.

Essential Components of ELD Classes for LTELs

| COMPONENT | BRIEF DESCRIPTION |
|---|---|
| A Focus on Oral Language | Oral language is the foundation for literacy. A course designed for LTELs must be a classroom in which students are talking. If they are not using the language, if they are not engaged in talking about what they are learning, they are not actually learning it. Structured oral language practice, instructional conversations, and multiple opportunities for speaking are a means of practicing academic language actively participating in authentic academic discussion, and processing the language prior to writing. |
| A Focus on Student Engagement | An effective LTEL classroom needs to address the entrenched non-participation and non-engagement that frequently characterize LTELs. Teachers use multiple strategies to elicit and support students' engagement in academic discourse and activity. There is a lot of student-to-student interaction. |
| A Focus on Academic Language | LTELs need to learn the language of academics. Without it, they neither comprehend the texts not are they able to participate in academic discourse and writing. LTEL classes, therefore, have a major emphasis on providing the language structures and forms needed for apprenticeship into academic discourse and academic participation. |
| A Focus on Expository Text (Reading and Writing) | Engagement with academic learning requires the skills of reading and writing expository academic text. LTELs typically struggle with this – lacking vocabulary to comprehend the information and struggling with the discourse patterns of academic presentations. They need to learn how academic text is structured. LTEL classes teach students reading strategies to make their way through different kinds of informational texts. This support is essential for all of the students' academic classes. |
| Consistent Routines | LTELs benefit from consistent academic routines. They face the challenge of grappling with rigorous academic content, trying to master new skills and simultaneously wrestling to learn through a language they have not yet mastered. Consistency in a set of routine instructional approaches enables them to lower their “affective filter” and to participate more fully in class. |
| Goal Setting | LTEL class needs to include a component of academic and language goal setting. Students need the information to understand why they are considered English Learners, what it means to be an English Learner, the levels of English needed for academic engagement and success, where they are along the spectrum of progress toward English proficiency, the CELDT test's role, reclassification requirements, and their own personal progress. |
| Empowered Pedagogy | Students learn through making connections between what they know, what they have experienced, and how they understand the world and the new experiences, perspectives, and information they encounter. Many LTELs feel disconnected from school. To ignite (or reignite) an excitement about learning and a sense of connection to their own education, teachers need to structure the classroom climate, process, pedagogy, and curriculum in ways that help students make connections. |

⁹⁰³ Hahnel et al., Op. cit., p. 17.

⁹⁰⁴ Ibid., p. 19.

⁹⁰⁵ Olsen, “Secondary School Courses Designed to Address the Language Needs and Academic Gaps of Long Term English Learners,” Op. cit., p. 24.

| COMPONENT | BRIEF DESCRIPTION |
|------------------------------------|---|
| Rigor | LTEs face both linguistic and academic challenges to engaging with grade-level standards, and by secondary school, they have few remaining years to recoup gaps that have accrued over time. It is a pervasive temptation of intervention classes to slow down or water down content, yet what LTEs need most is an accelerated, rigorous approach that overcomes gaps. |
| Community and Relationships | LTEs have typically become non-participants in school, in part because they have lacked the language to understand instruction, feel uncomfortable about not adequately comprehending and being afraid of making mistakes and being ridiculed. Teachers of LTE classes find that it is important to build relationships with their students and also to create a climate in the classroom that fosters safe, trusting relationship among students. |
| Study Skills | LTEs typically have not had explicit instruction in metacognitive skills development and therefore exhibit gaps in study skills and effective study habits. They do not read outside the classroom, struggle with assignments but do not understand how to problem-solve when they face academic challenges, do not complete homework, and seldom ask for help. Building students' study skills such as note-taking, organizing materials, time management, doing independent research, keeping notebooks, etc. is one of the components in many LTE classes. |

Source: Californians Together⁹⁰⁶

⁹⁰⁶ Adapted from: Olsen, "Secondary School Courses Designed to Address the Language Needs and Academic Gaps of Long Term English Learners," Op. cit., pp.16–20.

REPORT IV: BEST PRACTICES IN SPECIAL EDUCATION

INTRODUCTION

The Individuals with Disabilities Act (IDEA) requires that students with disabilities receive Free Appropriate Public Education (FAPE) in the “least restrictive environment” (LRE) possible.⁹⁰⁷ Specifically, the legislation states that students with disabilities should be educated with their non-disabled peers as much as possible, unless the severity of the disability inhibits instruction in the general education classroom.⁹⁰⁸ However, facilitating the inclusion of special education students in general education classrooms can pose a variety of challenges to teachers and school administrators.

To support district with special education services, Hanover presents this report which reviews the literature on the best practices for special education programs, as well as strategies for improving achievement, attendance, and behavior of students with disabilities.

BEST PRACTICES FOR SPECIAL EDUCATION PROGRAMS

This section discusses processes for identifying students with disabilities, special education service delivery models, and staffing considerations.

IDENTIFYING SPECIAL EDUCATION STUDENTS

To qualify for special education services, a student must meet the characteristics defined within the IDEA’s 14 disability categories, detailed [here](#). These categories provide broad guidance on common needs groupings, such as autism, deafness, emotional disturbance, and speech and language impairment, each of which might require district and community stakeholders to adopt a unique service approach.⁹⁰⁹ Using these federal guidelines, states establish procedures for local education agencies (LEAs) charged with identifying and serving children with disabilities.⁹¹⁰

A team consisting of qualified professionals and the child’s parents use these state and federal guidelines to determine eligibility for accommodations under the IDEA.⁹¹¹ This evaluation process may be initiated by either the child’s parents or a public agency (i.e., the child’s school).⁹¹² The team assesses a student’s strengths and needs by gathering information from a variety of sources, such as medical records, behavioral data, academic data, observational data, and data from formal testing.⁹¹³ This team must consist of:⁹¹⁴

- The student’s parents
- At least one of the student’s general education teachers (if the student participates in the general education environment)
- At least one of the student’s special education teachers
- A representative of the public agency

⁹⁰⁷ “Individuals with Disabilities Education Act.” Sec. Part B, Section 612(5)(B). 2004. <http://idea.ed.gov/download/statute.html>

⁹⁰⁸ “Least restrictive environment.” Building the Legacy: IDEA 2004, U.S. Department of Education. <http://idea.ed.gov/explore/view/p/root/statute,1B,612,a,5>,

⁹⁰⁹ “Categories of Disability Under IDEA.” Center for Parent Information and Resources, 2017. <http://www.parentcenterhub.org/repository/categories/>

⁹¹⁰ “Identification of Specific Learning Disabilities.” U.S. Department of Education-Office of Special Education Programs, 2006. p. 1. http://idea-b.ed.gov/uploads/Identification_of_SLD_10-4-06.pdf

⁹¹¹ “Eligibility: Determining Whether a Child Is Eligible for Special Education Services.” Learning Disabilities Association of America. <https://ldaamerica.org/eligibility-determining-whether-a-child-is-eligible-for-special-education-services/>

⁹¹² “Changes in Initial Evaluation and Reevaluation.” U.S. Department of Education-Office of Special Education Programs, 2006. p. 1. http://idea-b.ed.gov/uploads/Changes_in_Evaluation_and_Reevaluation_10-4-06.pdf

⁹¹³ Smith, D.D. “Steps in the IEP Process.” Education.Com, April 30, 2014. <https://www.education.com/reference/article/steps-individualized-education-program-IEP/>

⁹¹⁴ “Individualized Education Program (IEP) Team Meetings and Changes to the IEP.” U.S. Department of Education-Office of Special Education Programs, 2006. p. 1. https://idea.ed.gov/uploads/IEP_Team_and_Changes_to_the_IEP_10-4-06.pdf

- An individual who can interpret the instructional implications of evaluation results (may also be one of the other listed members)
- At the discretion of the parent or the agency, other individuals who have knowledge or expertise specific to the student, including related services personnel
- Whenever appropriate, the student

After this initial assessment, the team decides whether the collected data and information qualify a student for special education services.⁹¹⁵ As proof of eligibility, documentation must include a statement detailing the reasoning for special education qualification.⁹¹⁶

Should the team determine that the student has a disability and qualifies for special education services, the committee constructs a plan of accommodations and services. If the team decides that a student is ineligible for special education services, then he/she will continue to receive the prescribed general education program.⁹¹⁷

UNDERREPRESENTED STUDENT GROUPS IN SPECIAL EDUCATION

Research is mixed on the status of underrepresented student groups in special education, indicating that underrepresentation or overrepresentation may differ by state and school district. For example, some research finds that compared to white students, traditionally disadvantaged groups of students in the United States—such as African Americans and Hispanics—are overrepresented in special education programs. According to a report in *U.S. News and World Report*, African American students comprise 14 percent of the overall school-age population in 2015, but make up 19 percent of the special education population. Additionally, Hispanic students are even more likely to be identified as having a disability compared to African-Americans.⁹¹⁸ Some researchers suggest that the disparities in special education referral rates may be partially explained by improper or unnecessary referrals of minority students by white educators, often due to cultural misunderstanding or linguistic differences.⁹¹⁹ The existing literature notes that a teacher's judgment of the appropriateness of the referral for special education is usually "conditioned by that teacher's self-efficacy with respect to instructing or interacting with students from a class or cultural background different from his or her own."⁹²⁰

Alternatively, a 2017 *Educational Researcher* study found that when taking academic achievement and family income into account, minority students are actually underrepresented in special education programs compared to white students with similar levels of performance.⁹²¹ Their findings indicate that African-American students are between 58 and 77 percent less likely than comparable white students to be diagnosed with a learning disability, depending on the disability. Similarly, Hispanic children are less likely to be diagnosed than white children by 29 percent for a learning disability, 33 percent for a speech or language impairment, and 73 percent for other health impairments.⁹²² If minority students are actually under-referred to special education programs, there may be substantial populations of students who are not receiving the support they need to excel.

⁹¹⁵ Smith, Op. cit.

⁹¹⁶ Bulleted text copied verbatim from: "Identification of Specific Learning Disabilities," Op. cit., pp. 3–4.

⁹¹⁷ Smith, Op. cit.

⁹¹⁸ Bidwell, A. "What You Thought About Minority Students and Special Ed Is Wrong." *U.S. News and World Report*, June 24, 2015. <http://www.usnews.com/news/articles/2015/06/24/penn-state-study-minority-students-underrepresented-in-special-education>

⁹¹⁹ Skiba, R.J. et al. "The Color of Discipline: Sources of Racial and Gender Disproportionality in School Punishment." *The Urban Review*, 34:4, 2002. p. 276. Accessed via ProQuest.

⁹²⁰ Skiba, R.J. "Achieving Equity in Special Education: History, Status, and Current Challenges." *Exceptional Children*, 74:3, 2008. p. 281. Accessed via SagePub.

⁹²¹ [1] Morgan, P.L. et al. "Replicated Evidence of Racial and Ethnic Disparities in Disability Identification in U.S. Schools." *Educational Researcher*, 46:6, August 1, 2017. Accessed via SagePub. [2] Gordon, N. "Race, Poverty, and Interpreting Overrepresentation in Special Education." Brookings Institution, September 20, 2017. <https://www.brookings.edu/research/race-poverty-and-interpreting-overrepresentation-in-special-education/>

⁹²² Morgan et al., Op. cit.

STRATEGIES

Regardless of whether minority students are overrepresented in special education programs or chronically underserved by them, the literature notes a strong need for a more rigorous and consistent special education referral process. The process should be culturally and linguistically sensitive and should not determine disability status based on student background. Researchers also advocate for multifaceted assessments and intervention plans to track students over time and to build a full student record to better identify students for intervention or special education referral.⁹²³

Experts indicate that improved frameworks for identifying struggling students and accurate referral processes for special education programs require adequate teacher training. Professional training in managing behaviors associated with specific learning disabilities is important for all teachers to avoid unfairly targeting minority students by ensuring that the identification and referral process is culturally responsive.⁹²⁴ The figure below highlights research-based strategies for increasing cultural and linguistic equity in special education identification.⁹²⁵

Strategies for Increasing Equity in Special Education Identification

| STRATEGY | DESCRIPTION |
|---|---|
| Teacher Preparation | Issues of cultural mismatch suggest that teachers may lack the knowledge and skills to successfully interact with students different from themselves, which highlights the importance of teacher training in culturally responsive pedagogy. |
| Improved Behavior Management | Inadequate classroom management increases the risk for over-referral of minority students to special education. Culturally responsive behavioral supports are a promising method for addressing classroom disruption and discipline. |
| Prevention and Early Intervention | The disproportionate representation of minorities in special education is partly due to social and demographic factors that concentrate risk factors in minority populations. A primary prevention model, such as cultural brokering, may be offered to more at-risk students to help address disproportionality. |
| Pre-Referral Intervention/Response to Intervention | Guidance by the National Alliance of Black School Educators (NABSE) and the Council for Exceptional Children charges school administrators with responsibility for implementing effective pre-referral intervention systems. |
| Assessment | There is ample opportunity for bias to occur during the process of special education eligibility decision-making. Some researchers suggest an assessment model with an increased emphasis on context for understanding a student's academic or behavioral difficulty. |
| Family and Community Involvement | Parents and families should be involved in the pre-referral/response to intervention (RTI) process, and the values of families and culture integrated into all special education decision-making processes. |
| Policy and Systems Reform Recommendations | The disproportionality of student special education referrals necessitates systemic reform and policy change. Some researchers suggest examining federal, state, district, and school policies to create culturally responsive educational systems, including school financing, influence of high-stakes tests, teacher performance with culturally diverse populations, and teacher training in culturally competent pedagogy. |

Source: *Exceptional Children*⁹²⁶

⁹²³ Skiba et al., Op. cit., pp. 279–280.

⁹²⁴ Ibid., p. 280.

⁹²⁵ Skiba, R.J., Op. cit., pp. 280–281.

⁹²⁶ Figure contents quoted verbatim with minor edits from: Ibid.

AT-RISK SPECIAL EDUCATION STUDENTS

Nationally, students with disabilities are at a much higher risk of dropping out than students without disabilities.⁹²⁷ In Texas, the graduation rate for students in special education was 77.9 percent for the class of 2016, versus the national average of 89.1 percent.⁹²⁸ This low rate of high school graduation with a regular diploma has a serious impact on the employment rate and earnings of students with disabilities. According to the Bureau of Labor Statistics, the unemployment rate for those with less than a high school diploma is over 12 percent—almost double that of all workers.⁹²⁹

However, districts can increase the chances that students with disabilities will graduate by identifying at-risk students in special education and providing appropriate supports. The National Dropout Prevention Center for Students with Disabilities (NDPC-SD) offers multiple resources and tools for districts to help at-risk special education students. For example, the NDPC-SD Risk Calculator tool helps schools (1) accurately identify special education students who are at-risk and (2) assign them to the appropriate intervention. Designed for students with disabilities, the Risk Calculator tool uses student-level data on academic achievement, behavior, attendance, and engagement to predict a student's risk of dropping out and recommend areas for intervention, such as reading, behavior, or attendance, to reduce their risk of dropping out.⁹³⁰

Additionally, schools can support at-risk special education students by holding students to high expectations, including students in general education classrooms, and providing tutoring.⁹³¹ Similarly, features of successful programs for decreasing the dropout rates of students with disabilities include that they:⁹³²

- Use indicators to identify students who are at risk
- Assign advocates to work with students at risk
- Provide supports and enrichment to improve the academic performance of those at risk, implementing programs to improve classroom behavior and social skills
- Personalize instruction and the learning environment
- Provide instruction that engages students and prepares them for graduation and skills they will need after graduation

SPECIAL EDUCATION SERVICE DELIVERY MODELS

The **IDEA** requires LEAs to “provide a full continuum of options in the least restrictive environment whenever possible to meet a student’s individual needs.”⁹³³ This continuum includes mainstreaming with supports, self-contained classes, pull-outs into specialized skills or content instruction, and co-taught classes, with the ultimate goal being to have students with disabilities participate in a general education environment as often as possible.⁹³⁴ The U.S. Department of Education defines a general education environment as including “regular classrooms and other settings in schools such as lunchrooms and playgrounds in which children

⁹²⁷ Cortiella, C. “Diplomas at Risk: A Critical Look at the Graduation Rate of Students with Learning Disabilities.” National Center for Learning Disabilities, 2013. p. 7. <http://www.decodingdyslexia.org/wp-content/uploads/2013/05/DiplomasatRisk.pdf>

⁹²⁸ Murphy, D. et al. “Secondary School Completion and Dropouts in Texas Public Schools 2015–16.” Texas Education Agency, August 2017. p. xii. https://tea.texas.gov/acctres/dropcomp_2015-16.pdf

⁹²⁹ [1] Cortiella, Op. cit., p. 7. [2] Hoff, N., A. Olson, and R. Peterson. “Dropout Screening & Early Warning.” Building and Sustaining Student Engagement, University of Nebraska, 2015. p. 4. <https://k12engagement.unl.edu/Dropout%20Screening%20&%20Early%20Warning%203-10-15.pdf>

⁹³⁰ Hoff, Olson, and Peterson, Op. cit., p. 12.

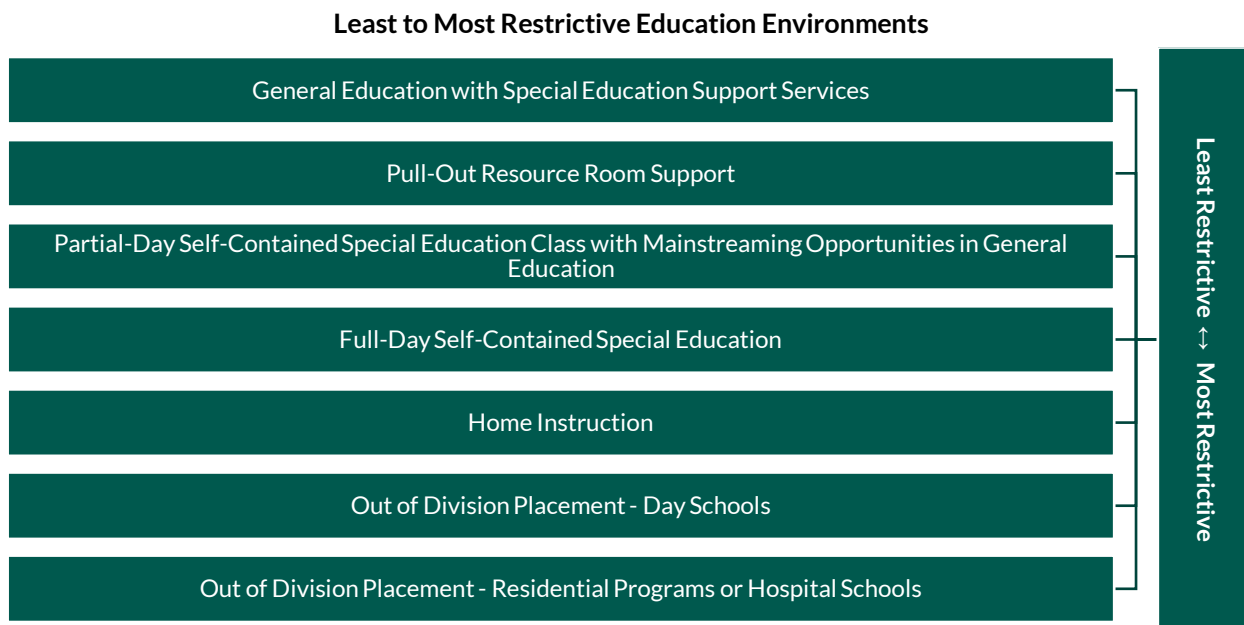
⁹³¹ Thurlow, M. “Addressing the Dilemma of High School Dropouts with LD.” National Center for Learning Disabilities. <https://www.ncld.org/archives/blog/addressing-the-dilemma-of-high-school-dropouts-with-ld>

⁹³² Bullet points quoted verbatim from: Ibid.

⁹³³ Posnick-Goodwin, S. “Is Your District Breaking Special Education Law?” California Teachers Association, May 8, 2012. <https://www.cta.org/en/Professional-Development/Publications/2012/05/May-Educator-2012/Spec-main.aspx>

⁹³⁴ Ibid.

without disabilities participate.”⁹³⁵ The figure below displays the continuum of education environments from least to most restrictive, as outlined by the Virginia Department of Education. Students may move between environments based on their individual needs.⁹³⁶



Source: Virginia Department of Education⁹³⁷

Regardless of the model, districts must maximize access to the curriculum for all students. Federal law protects students with disabilities from discrimination and mandates equal opportunities for all students. The six strategies in the following figure may help districts support students with disabilities and ensure the greatest degree of access to the general education environment. In addition to collaborating internally and with families to improve access, teachers may modify classroom procedures to increase access to the curriculum.⁹³⁸

⁹³⁵ Rebhorn, T. and A. Smith. “Building the Legacy: IDEA 2004 Training Curriculum (Module 15: LRE Decision Making).” National Dissemination Center for Children with Disabilities, 2008. p. 21. http://www.parentcenterhub.org/wp-content/uploads/repo_items/legacy/1-trainerguide.pdf

⁹³⁶ “Models of Best Practice in the Education of Students with Autism Spectrum Disorders.” Virginia Department of Education-Office of Special Education and Student Services, 2011. p. 27. http://www.doe.virginia.gov/special_ed/disabilities/autism/technical_asst_documents/autism_models_of_best_practice.pdf

⁹³⁷ Ibid.

⁹³⁸ “Educational Access for Students with Disabilities.” Pacific University. <https://www.pacificu.edu/about-us/offices/learning-support-services/faculty/educational-access-students-disabilities>

ACCESS Principles

Accessibility: Teachers play a major role in making their classrooms accessible to all students.

Communication: Educators, students, and parents communicate on a regular basis.

Confidentiality: School-based staff must respect a student's right to confidentiality.

Eligibility for Accommodations: The IEP team determines eligibility for federally mandated academic accommodations and services.

Student and Parent Responsibility: Students and parents have a responsibility in ensuring they get the necessary services.

Support: Teachers and other staff work together to support students and their families in their legal right to access an education.

Source: Pacific University⁹³⁹

In the following subsections, Hanover describes three specific models: the self-contained classroom model, the pull-out model, and the inclusion model.

SELF-CONTAINED MODEL

In a *self-contained classroom*, the teacher provides instruction to a set roster of students with specific needs within a defined physical space.⁹⁴⁰ Districts may locate self-contained classrooms in general education schools or in schools that specialize in educating students with disabilities – however, both segregate “general” from “special” education students.⁹⁴¹

Proponents argue that separate settings allow special education teachers to provide more individualized attention to special education students than would be possible in a general education environment. Further, the smaller class sizes found in self-contained settings are said to increase students' opportunity to receive instruction that is structured, paced, and sequenced to their needs.⁹⁴² Since students with disabilities may be ostracized by other students in a general education setting, self-contained classrooms also may be a more supportive environment.⁹⁴³

In contrast, opponents of self-contained settings argue that such environments are inherently discriminatory and inferior to the general education setting.⁹⁴⁴ During a seven-year study, researchers at Syracuse University and Chapman University found that the observed self-contained special education classrooms did not facilitate activities focused on community building. Further, students treated one another “in ways that compromised community and feelings of belonging.”⁹⁴⁵ The researchers concluded that the self-contained

⁹³⁹ Ibid.

⁹⁴⁰ Wise, A.E. “End the Tyranny of the Self-Contained Classroom - Education Week.” *Education Week*, January 25, 2012. http://www.edweek.org/ew/articles/2012/01/25/18wise_ep.h31.html?qs=End+the+Tyranny+of+the+Self-Contained+Classroom

⁹⁴¹ Cipriano, C. et al. “There's No 'I' in Team: Building a Framework for Teacher-Paraeducator Interactions in Self-Contained Special Education Classrooms.” *Journal of Classroom Interaction*, 51:2, July 2016. p. 4. Accessed via EBSCOhost.

⁹⁴² Eller, M. et al. “Is Inclusion the Only Option for Students with Learning Disabilities and Emotional Behavioral Disorders?” *The Undergraduate Journal of Law & Disorder*, 5, 2015. p. 8. <https://scholarworks.iu.edu/journals/index.php/lad/article/download/20704/26757>

⁹⁴³ Causton-Theoharis, J., G. Theoharis, F. Orsati, et al. “Does Self-Contained Special Education Deliver on Its Promises? A Critical Inquiry Into Research and Practice.” *Journal of Special Education Leadership*, 24:2, September 2011. p. 66. <http://includemepa.org/wp-content/uploads/2014/03/Does-Self-Contained-Special-Ed-deliver.pdf>

⁹⁴⁴ Eller et al., Op. cit., p. 5.

⁹⁴⁵ Causton-Theoharis, Theoharis, Orsati, et al., Op. cit., p. 67.

classrooms' arrangement, pedagogy, and expectations limited peer interaction and failed to provide the supportive environment touted by proponents of self-contained settings.⁹⁴⁶

The Syracuse University and Chapman University researchers also found distractions (e.g., behavioral incidents involving peers, entry and exit of specialists) to be frequent and problematic for students in self-contained classrooms. Large segments of the students' day were spent on nonacademic tasks (e.g., watching movies, free computer time, non-instructional games, "sitting around"). Moreover, a lack of routine and structure was evident during instructional time, and paraprofessionals spent more time with each student than the primary instructor. Lastly, teachers did not deliver lessons that aligned with state standards or resonated with students' daily lives and used instructional strategies such as worksheets and seatwork instead of inquiry-based or collaborative learning.⁹⁴⁷

Another study, conducted by researchers at the University of Kansas, used field notes and a time-sampling method to detail teacher and student behavior in self-contained classrooms in five high schools across four districts. Nineteen students and nine teachers were observed.⁹⁴⁸ The study noted several problem areas in self-contained classrooms, such as:⁹⁴⁹

- Special education teachers were the primary instructors in only 21 percent of observed cases
- Paraprofessionals provided the bulk of instruction
- Differentiation was nonexistent, as all students completed the same worksheets and activities
- Students had few opportunities to participate in the classroom and communicate with staff members and other students during instruction
- Students often distracted one another through their speech and actions
- Staff members appeared off-task when conversing with one another

PULL-OUT MODEL

The *pull-out model* featuring *resource room* support is the second LRE as seen in Figure 1.2.⁹⁵⁰ This model focuses on the *mainstreaming* or *integration* of a student with disabilities into the general education environment. Mainstreaming places students with disabilities in general education classrooms with supplemental supports to facilitate their learning. Integration includes mainstreaming as well as opportunities to interact with general education peers in activities outside the classroom. Special education students in an integrated environment participate in typical school activities (e.g., lunch, recess, clubs) and use the same facilities as students without disabilities (e.g., hallways, restrooms, cafeterias).⁹⁵¹

The resource room mentioned above is a space outside the general education classroom in which students with disabilities work on specific skills or content objectives with a specialist. Schedules for students with disabilities may combine general education classes with special education support and resource room instruction. Mathematics, reading, and language arts are commonly taught in a resource room setting.⁹⁵² When necessary, students may be "pulled out" of general education classes to take exams or receive

⁹⁴⁶ Ibid., pp. 67–68.

⁹⁴⁷ Ibid., pp. 68–71.

⁹⁴⁸ Kurth, J.A., K. Born, and H. Love. "Ecobehavioral Characteristics of Self-Contained High School Classrooms for Students with Severe Cognitive Disability." *Research & Practice for Persons with Severe Disabilities*, 41:4, December 2016. p. 228. Accessed via EBSCOhost.

⁹⁴⁹ Ibid., pp. 237–238.

⁹⁵⁰ "Models of Best Practice in the Education of Students with Autism Spectrum Disorders," Op. cit., p. 27.

⁹⁵¹ Feldman, J. and S. Rosenbaum, eds. "Chapter 7: Information on Least Restrictive Environment." In *Special Education Rights and Responsibilities (SERR)*, Community Alliance for Special Education and Disability Rights California. p. 2. <http://www.disabilityrightsca.org/pubs/504001Ch07.pdf>

⁹⁵² Vannest, K.J. et al. "Special Education Teacher Time Use in Four Types of Programs." *The Journal of Education Research*, 104:4, 2011. p. 221. Accessed via EBSCOhost.

assistance with long-term projects or short-term assignments.⁹⁵³ Students also may be pulled out of the general education classroom for needed services (e.g., counseling, occupational therapy, speech therapy).⁹⁵⁴

Proponents of the pull-out model argue that providing dedicated space and supports requires districts to invest in special education resources, instead of relying on inadequately trained general education teachers.⁹⁵⁵ However, opponents of the pull-out model claim that inclusion “is a moral imperative.”⁹⁵⁶ Pull-out services and resource rooms create a precedent for exclusion and establish a potential obstacle to creating heterogeneous class rosters.⁹⁵⁷

INCLUSION MODEL

Inclusion completely integrates students with disabilities into the general education setting, albeit with special support.⁹⁵⁸ Students with disabilities no longer have primary assignments to special education classes. However, students may still receive supplemental services as in the pull-out model.⁹⁵⁹

Because it is not defined by IDEA, school districts define and implement inclusion for students with special needs in a variety of ways. Nonetheless, many organizations offer guidance. The Inclusive Schools Network, a resource for schools and districts implementing inclusive education practices, states that inclusive education “means that all students are full and accepted members of their school community, in which their educational setting is the same as their non-disabled peers, whenever appropriate.”⁹⁶⁰

Empirical studies indicate that inclusive instruction can benefit both special and general education students, as well as educators and school districts.⁹⁶¹ One such example comes from Idol (2006) and an evaluation of inclusion programs at eight schools “in a large, metropolitan school district in a southwestern city.”⁹⁶² Idol gathered perception feedback from staff through structured interviews and examined statewide test data. In three of the four studied elementary schools, inclusion was followed by a noticeable improvement in average student test scores, and 36 percent of teachers “reported that having students with disabilities in general education classes resulted in an increase in the statewide test scores of general education students,” while 33 percent reported that there was no change. Similar results were found in the middle and high schools.⁹⁶³

Further, citing evidence from the National Longitudinal Transition Study-2 (NLTS2) that “inclusion leads to lower rates of suspension and drop out, and to higher rates of employment,” the [Maryland Coalition for Inclusive Education](#), a nonprofit organization that promotes the inclusion of students with disabilities at their neighborhood schools, notes that additional research-based benefits of inclusive education for students with disabilities include:⁹⁶⁴

- Greater access to the general education curriculum

⁹⁵³ “What Is The Difference Between The ‘Pull-Out’ And ‘Push-In’ Model In Special Education?” Professional Learning Board. <https://k12teacherstaffdevelopment.com/tlb/what-is-the-difference-between-the-pull-out-and-push-in-model-in-special-education/>

⁹⁵⁴ Barton, K. “Pull-out or Push-in? Impact on Students with Special Needs Social, Emotional, and Academic Success.” St. John Fisher College, 2016. p. 21. http://fisherpub.sjfc.edu/education_ETD_masters/334/

⁹⁵⁵ Hurt, J.M. “A Comparison of Inclusion and Pullout Programs on Student Achievement for Students with Disabilities.” East Tennessee State University, 2012. p. 26. <http://dc.etsu.edu/etd/1487/>

⁹⁵⁶ Stetson, F. “Redefining Inclusive Education.” *Language Magazine*, 16:4, December 2016. p. 22. Accessed via EBSCOhost.

⁹⁵⁷ Hurt, Op. cit., pp. 27–28.

⁹⁵⁸ Feldman and Rosenbaum, Op. cit., p. 2.

⁹⁵⁹ Ibid.

⁹⁶⁰ “Inclusion Basics.” Inclusive Schools Network. <http://inclusiveschools.org/category/resources/inclusion-basics/>

⁹⁶¹ Causton-Theoharis, J., G. Theoharis, T. Bull, et al. “Schools of Promise: A School District - University Partnership Centered on Inclusive School Reform.” *Remedial and Special Education*, 32:3, June 2011. p. 4.

⁹⁶² Idol, L. “Toward Inclusion of Special Education Students in General Education: A Program Evaluation of Eight Schools.” *Remedial and Special Education*, 27:2, April 2006. p. 77. Accessed via ProQuest.

⁹⁶³ Ibid., pp. 79–89.

⁹⁶⁴ Bullets quoted verbatim from: “What Is Inclusive Education?” Maryland Coalition for Inclusive Education. <http://www.mcie.org/pages/about-inclusive-education/what-is-inclusive-education>

- More time "on task"
- More academic gains
- More progress on literacy skills
- Increased communication skills
- Improved social skills and more friendships
- Improved IEPs

BEST PRACTICES IN INCLUSIVE SCHOOLS

The National Center on Inclusive Education (NCIE), a division of the University of New Hampshire's Institute on Disability, developed a research-based [guide](#) of "Essential Best Practices in Inclusive Schools."⁹⁶⁵ The following figure the inclusion strategies recommended by the NCIE.

Essential Best Practices in Inclusive Schools

| CATEGORY | DESCRIPTION |
|--|--|
| High Expectations and Least Dangerous Assumption | The inherent value and dignity of students with disabilities is respected. All students with disabilities pursue the same learner outcomes as students without disabilities. When students do not currently demonstrate content knowledge or skills, the least dangerous assumption of presuming competence applies, and all aspects of their educational programs continue to reflect high expectations. |
| General Education Class Membership and Full Participation | Students with disabilities are welcomed members of age-appropriate general education classes in their neighborhood schools. There are no programs or rooms just for students with disabilities and these students have access to the full range of learning experiences and environments offered to students without disabilities. |
| Quality Augmentative and Alternative Communication | Students unable to communicate in ways commensurate to their same age classmates are provided with assistive technology such as augmentative and alternative communication. |
| Curriculum, Instruction, and Supports | Curriculum and instruction are designed to accommodate the full range of student diversity based on universal design principles. Individualized supports are provided to students with significant disabilities to enable them to fully participate and make progress within the general education curriculum. Students learn functional or life skills within typical routines in the general education classroom or other inclusive activities and environments. |
| Ongoing Assessment and Evaluation of Learning | Members of educational teams conduct authentic, performance-based assessments within typical activities in inclusive environments for the purpose of identifying students' preferences, talents, and interests; academic knowledge and skills; and support needs in the areas of learning, communication, movement, emotion, sensory, behavior, and essential life skills. They evaluate student learning in natural contexts and settings, with accommodations that promote students' demonstration of their "best work." Progress monitoring and other formative assessments are used to inform instruction and to determine when students need intensive interventions. |
| Family-School Partnerships | Families and schools are engaged in equitable partnership to create quality inclusive educational experiences for students with disabilities. Families are connected to resources for developing their own knowledge base, leadership and advocacy skills. |

⁹⁶⁵ Jorgensen, C.M. et al. "Essential Best Practices in Inclusive Schools." National Center on Inclusive Education, 2012. p. 2.
<http://www.tash.org/wp-content/uploads/2011/03/Essential-Best-Practices-070312-FULL-Jorgensen.pdf>

| CATEGORY | DESCRIPTION |
|---|--|
| Community Partnerships | School personnel maintain purposeful, active, and positive relationships with families of their students and with the community in which they operate. Communications within the community are welcoming, visible, purposeful, and take into account diverse populations. Community agencies play a key role in providing services to students and families. They work collaboratively and share resources with the school to strengthen the comprehensive network of support. |
| Team Collaboration | General and special education teachers, Title I staff, reading specialists, related service providers, paraprofessionals, parents and when appropriate, students themselves, demonstrate shared responsibility by collaborating in the design, implementation, and evaluation of students' educational programs and their IEPs. |
| Friendships and Social Relationships | Being welcomed by members of general education classes, going to recess, eating in the cafeteria, and access to extracurricular activities are recognized as key ingredients to the formation of friendships. |
| Futures Planning, Graduation, and Transition to Adult Life | Students with disabilities are more likely to transition from school to adult life college and career ready when they have a fully inclusive educational experience. Inclusive education affords students with disabilities the opportunity to develop meaningful relationships, social networks, and social skills; experience improved academic outcomes, and explore career and post-secondary options commensurate with their nondisabled peers. |
| Self-Determination | Students are instructed in and provided with opportunities to develop the component elements of self-determination as part of their social and academic experiences in school. Students with disabilities may attend and direct their own IEP meetings, join organizations of their choosing, and design a post-graduation "futures plan" for fully inclusive life in the community. |
| School Improvement | School improvement efforts are designed to create an equitable and inclusive learning environment, addressing the social and individual barriers to learning, and eliminating tracking and cultural biases. |
| Resources | Students and teachers need adequate resources in order for optimal teaching and learning to occur. Each staff member assumes responsibility for identifying and acquiring needed resources. When staff are unable to obtain these resources after reasonable attempts, administrators are notified and they work to provide them. |
| Professional Development | Ongoing, job embedded professional development is highly valued, collaborative, combines both training and coaching, and is linked to improved educational outcomes for students. School leaders have provided a variety of structures from which staff can choose when participating in professional development and have designed structures to assure the successful transfer of learning into practice including opportunities to receive feedback on teaching strategies, observe exemplary practices, and reflect on practice. |

Source: National Center on Inclusive Education⁹⁶⁶

Similarly, a 2011 [guidebook](#) by the Virginia Department of Education on educating students with autism spectrum disorders emphasizes how a student's inclusion in a general education classroom must be driven by the student's individual needs rather than what is most convenient or cost-effective for the school district.⁹⁶⁷ The figure below highlights suggested components and specific strategies and skills of successful inclusion programs.

Components for Successful Inclusion

| COMPONENT | STRATEGIES AND SKILLS |
|--|---|
| Teachers are trained in a wide variety of teaching methods to address diverse student needs. | Priming, prompt delivery, daily schedules, mini-schedules, systematic instruction, peer-mediated interventions, Augmentative and Alternative Communication (AAC). |

⁹⁶⁶ Figure content quoted verbatim with modifications from: Ibid., pp. 3–14.

⁹⁶⁷ "Models of Best Practice in the Education of Students with Autism Spectrum Disorders." Virginia Department of Education, Office of Special Education and Student Services, 2011. p. 28.
http://www.doe.virginia.gov/special_ed/disabilities/autism/technical_asst_documents/autism_models_of_best_practice.pdf

| COMPONENT | STRATEGIES AND SKILLS |
|--|---|
| Adequate supports are provided so skill development is integrated into the general education classroom activities. | Environmental modifications, visual supports, schedules, structured activities, small group instruction, self-management strategies. |
| Adequate supports are provided to the student to foster peer interaction. | Peer mediated interventions, peer buddies, Lunch Bunch, visual supports, integrated related services personnel, adult support. |
| Team members collaborate and support the inclusion opportunity. | Parent involvement, parent-teacher conferences, homeschool communication book, team meetings, parent training, paraprofessional training. |

Source: Virginia Department of Education⁹⁶⁸

Such recommended practices, especially the importance of planning, are identified through empirical research as well. For instance, in 2004, Laframboise, Epanchin, and Colucci published a study in *Action in Teacher Education* examining the characteristics of effective inclusive education practices in a sample of three school districts. The researchers found that **the characteristics of successful inclusion teachers and classrooms included organization, planning based on assessment, and differentiated instruction.**⁹⁶⁹ Organization provides structure and stability and was evidenced by clear and published schedules, students who knew what to do at various parts of the day, and planned, efficient transitions between activities. Regular planning allowed the teachers to individualize curriculum, lessons, and activities for engaged instruction.⁹⁷⁰

Accordingly, teachers indicated that time management and effective communication were also critical components of their success.⁹⁷¹ However, the researchers found that **special education teachers who divided their time between multiple inclusive classes often noted they did not have sufficient time for planning or communication.**⁹⁷²

Inclusive classrooms use a variety of methods to provide appropriate services to all students within the shared classroom, including differentiated instruction and co-teaching.

Differentiated Instruction

Differentiated instruction is the process of teaching the same content in different ways to different students. This involves individualizing lessons and activities based on a student's abilities, readiness, or interest. Carol Tomlinson, an academic practitioner focused on differentiated instruction, describes four areas in which teachers can differentiate instruction: **content, process, products, and the learning environment.**⁹⁷³ Descriptions and examples of each of the four areas are presented in the figure below.

⁹⁶⁸ Figure reproduced verbatim from: Ibid.

⁹⁶⁹ Laframboise, K., B. Epanchin, and K. Colucci. "Working Together: Emerging Roles of Special and General Education Teachers in Inclusive Settings." *Action in Teacher Education*, 26:3, 2004. pp. 35–36. Accessed via EbscoHost.

⁹⁷⁰ Ibid., p. 36.

⁹⁷¹ Ibid., p. 38.

⁹⁷² Ibid., p. 39.

⁹⁷³ Tomlinson, C. "Differentiation of Instruction in the Elementary Grades. ERIC Digest." *ERIC Clearinghouse on Elementary and Early Childhood Education*, August 2000. p. 2. <http://files.eric.ed.gov/fulltext/ED443572.pdf>

Areas of Differentiated Instruction

| AREA DESCRIPTION | EXAMPLES OF PRACTICE |
|--|--|
| <p>Content: What the student needs to learn or how the student will get access to the information.</p> | <ul style="list-style-type: none"> ▪ Using reading materials at varying readability levels; ▪ Making text materials auditory; ▪ Using spelling or vocabulary lists at readiness levels of students; ▪ Presenting ideas through both auditory and visual means; ▪ Using reading buddies; and ▪ Meeting with small groups to re-teach an idea or skill for struggling learners, or to extend the thinking or skills of advanced learners. |
| <p>Process: Activities in which the student engages in order to make sense of or master the content.</p> | <ul style="list-style-type: none"> ▪ Using tiered activities through which all learners work with the same important understandings and skills, but proceed with different levels of support, challenge, or complexity; ▪ Providing interest centers that encourage students to explore subsets of the class topic of particular interest to them; ▪ Developing personal agendas (task lists written by the teacher and containing both in-common work for the whole class and work that addresses individual needs of learners) to be completed either during specified agenda time or as students complete other work early; ▪ Offering manipulatives or other hands-on supports for students who need them; and ▪ Varying the length of time a student may take to complete a task in order to provide additional support for a struggling learner or to encourage an advanced learner to pursue a topic in greater depth. |
| <p>Products: Culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit.</p> | <ul style="list-style-type: none"> ▪ Giving students options of how to express required learning (e.g., create a puppet show, write a letter, or develop a mural with labels); ▪ Using rubrics that match and extend students' varied skills levels; ▪ Allowing students to work alone or in small groups on their products; and ▪ Encouraging students to create their own product assignments as long as the assignments contain required elements. |
| <p>Learning environment: The way the classroom works and feels.</p> | <ul style="list-style-type: none"> ▪ Making sure there are places in the room to work quietly and without distraction, as well as places that invite student collaboration; ▪ Providing materials that reflect a variety of cultures and home settings; ▪ Setting out clear guidelines for independent work that matches individual needs; ▪ Developing routines that allow students to get help when teachers are busy with other students and cannot help them immediately; and ▪ Helping students understand that some learners need to move around to learn, while others do better sitting quietly. |

Source: Education Resources Information Center⁹⁷⁴

Research on inclusive classrooms consistently recommends the use of differentiated instruction for teaching students with a diverse range of abilities. The Schoolwide Integrated Framework for Transformation (SWIFT), an inclusion initiative supported by the U.S. Department of Education's Office of Special Education Programs (OSEP), recommends that teachers should "use multi-tiered instructional strategies, differentiation, Universal Design for Learning, and flexible grouping to support instruction of all students, including those with the most extensive support needs."⁹⁷⁵ Furthermore, many studies support the use of activities and lessons that are engaging and appeal to a student's interests.

⁹⁷⁴ Figure contents verbatim with modification from: Ibid.

⁹⁷⁵ "Swift Guide: Inclusive Academic Instruction." SWIFT Schools. <http://guide.swiftschools.org/multi-tiered-system-of-support/inclusive-academic-instruction>

For example, an article in *Social Studies Research and Practice* on incorporating K-3 students with disabilities into general education classrooms found that successful instructional strategies include:⁹⁷⁶

- Activity-oriented instruction
- Instruction related to students' everyday experiences
- Interesting subject-area activities
- Appropriate linguistic and conceptual content demands
- Efficient classroom management, establishing ground rules and procedures for activities
- A focus on skills development throughout activities

Co-Teaching

Co-teaching, a common method for educating students in inclusive classrooms, describes **when two qualified teachers “shar[e] the roles and responsibilities of instruction” for a mixed group of general education and special education students in the same classroom at the same time.**⁹⁷⁷ One teacher is usually a general education teacher; the other is typically a special education teacher, but could also be a speech/language therapist or ESL teacher.⁹⁷⁸ Both teachers share responsibility for all the students regardless of whether the student has (or does not have) an IEP.⁹⁷⁹ However, according to Marilyn Friend, a prominent co-teaching researcher, the roles of the general education and special education teacher may differ slightly, and each should be aware of his or her role to facilitate a working relationship. The contributions of each co-teacher appear in the following figure.

Co-Teachers' Contributions

| AREA | GENERAL EDUCATOR | SPECIAL EDUCATOR |
|--|--|---|
| Assigned Primary Instructional Responsibility | Knowledge and skill related to the specific core academic curriculum and how it fits into the larger curriculum context. | Focus on specially designed instruction that enables students to access and succeed in learning the general curriculum. |
| Student Focus | Attention to each student, but primary focus on designing instruction to meet the needs of the overall class group. | Primary focus on in-depth knowledge of each student on the assigned case-load. |
| Instructional Process | Awareness of the importance of pacing for ensuring that all key content is addressed. | Concern with individual student mastery of key concepts and skills, with group pacing a secondary consideration. |

Source: Friend⁹⁸⁰

While co-teachers generally share resources and responsibilities equally, the method may differ by lesson or day. Overall, researchers identify six effective co-teaching models, described in the figure below. Note that the final two models (one teach, one assist; and one teach, one observe), which place one co-teacher in sole authority, should be used sparingly.⁹⁸¹

⁹⁷⁶ Bullet points quoted verbatim from: Johnson, J. and R. Busby. "Including Young Learners with Special Needs in Social Studies Classrooms." *Social Studies Research & Practice*, 10:3, 2015. p. 101. Accessed via EbscoHost.

⁹⁷⁷ "Increasing Effectiveness of In-Class Support." Stetson & Associates, Inc., 2012. p. 1. <http://inclusiveschools.org/wp-content/uploads/2015/09/Hot-Topics-Co-Teach.pdf>

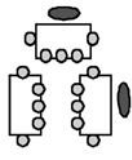
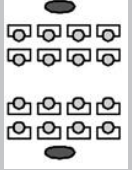
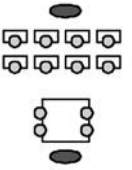


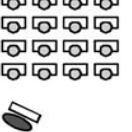
⁹⁷⁸ Friend, M. "Co-Teaching: Strategies to Improve Student Outcomes." 2014. p. 1. <http://blog.nprinc.com/downloads/coteaching-strategies-to-improve-student-outcomes-coio.pdf>

⁹⁷⁹ Ibid.

⁹⁸⁰ Figure reproduced verbatim from: Friend, Op. cit.

⁹⁸¹ Bullets points quoted verbatim from: "Increasing Effectiveness of In-Class Support," Op. cit., p. 3.

Co-teaching Models

| MODEL | ARRANGEMENT | DESCRIPTION |
|------------------------|---|--|
| Station Teaching |  | Students and teachers are arranged in stations and rotate so that all students work with each other and, if appropriate, independently. |
| Parallel Teaching |  | Half the class works with one teacher while the other half works with the other teacher on the same instructional content for a predetermined period of time. |
| Alternative Teaching |  | One teacher is instructing the majority of students in the class and the other teacher pulls a small group of students from the large group to accomplish a specific instructional task. |
| Team Teaching |  | Both teachers share equal responsibility for providing instruction during the lesson or activity or class. |
| One Teach, One Assist |  | One teacher is responsible for class instruction while the other teacher provides support to students during instruction. |
| One Teach, One Observe |  | One teacher takes responsibility for teaching the lesson while the second teacher observes what is going on in the classroom. |

Source: *Journal of Educational and Psychological Consultation*⁹⁸²

Co-teaching requires a high degree of collaboration, and research indicates that co-taught classrooms are more successful when the general education teacher and special education teacher share responsibility as much as possible. In some classrooms, teachers act as equals so there is not a discernible difference as to which students have disabilities (mostly for students with learning and behavioral disabilities). This level of collaboration is important, with one study noting that teachers “responded to individual needs and questions depending on which teacher was available” rather than if the student had special needs. Additionally, in the classrooms studied, “teachers were not identified with a particular group of students; that is, both teachers taught all of the students and all students worked with and asked assistance from both teachers.”⁹⁸³

The Inclusive Schools Network suggests that when developing a collaborative teaching partnership, each teacher should reflect upon and consider their personal commitment to the role and the interpersonal dynamics of the relationship. Each should be comfortable sharing a classroom. To prevent interpersonal

⁹⁸² Friend, M. et al. “Co-Teaching: An Illustration of the Complexity of Collaboration in Special Education.” *Journal of Educational & Psychological Consultation*, 20:1, January 2010. p. 12. Accessed via EbscoHost.

⁹⁸³ Laframboise, Epanchin, and Colucci, Op. cit., p. 36.

conflict, teachers should openly discuss their core beliefs, role expectations, teaching styles and approaches to student learning, and approaches to classroom management. Discussing similarities and differences in personal styles and preferences before teaching helps to preclude future conflict in the co-teaching relationship.⁹⁸⁴

Further, research consistently supports the importance of designated planning time for co-teachers. According to the Inclusive Schools Network, for planning to be effective and meaningful, districts should build time for planning into teachers' schedules, rather than hastily squeezed in between class transitions.⁹⁸⁵ Friend adds that a lack of planning time is what co-teachers most often cite as the largest barrier to co-teaching success. She recommends that, in addition to frequent lesson-planning meetings, co-teachers convene at least once a month to review student data for strengths and needs and to identify general instructional approaches for the coming weeks.⁹⁸⁶ The following figure highlights ways schools can create planning time for co-teachers. Notably, many of these strategies suggest focusing on planning (as opposed to administrative duties) during planning time and utilizing other staff or volunteers to supervise students so that teachers have time for planning.

Suggestions for Creating Time for Planning and Collaboration

- If you decide to use before or after the school day to meet, try to make it as enjoyable as possible to encourage participation among team members. Share responsibility for bringing coffee and doughnuts or take turns bringing afternoon snacks;
- Eliminate or reduce teacher administrative assignments or schedule these assignments so that co-teaching teams can be free during the same periods;
- Extend the lunch period by 15 minutes one or two times per week. Enlist specialists, support staff or family volunteers to supervise.
- Organize regularly scheduled large-group activities (lectures, music/art exhibits, etc.) that can be managed by support staff and specialists so that co-teaching teams can work together;
- Hire regular substitutes or engage family volunteers to work with students during regularly scheduled blocks of time;
- Create a planning website as an additional support to the planning process. Unit outlines, lesson plans and resources can be shared among the team. A discussion forum can be included. Be sure that all team members are aware that information about students should not be discussed online;
- Make sure that the school community and families understand the reasons for incorporating common planning time into the schedule. Some may see it as taking away time from their child's instruction without understanding the benefits. Information about common planning time can be posted on the school website, the school manual or explained in a newsletter;
- Utilize an agreed upon protocol during your planning meetings to maximize your time together; and
- Use the time to focus on curriculum and instruction. Avoid sessions focused on venting and complaining. The motto "We don't admire the problems!" can help.

Source: Inclusive Schools Network⁹⁸⁷

To increase the quality of co-teacher planning sessions, co-teachers should focus on standards, assessment, accommodations, instructional strategies, and logistics.⁹⁸⁸ The following figure provides a checklist for using co-planning time effectively.

⁹⁸⁴ "Increasing Effectiveness of In-Class Support," Op. cit., p. 1.

⁹⁸⁵ "Scheduling for Success: Common Planning Time." Inclusive Schools Network. <http://inclusiveschools.org/scheduling-for-success-common-planning-time/>

⁹⁸⁶ Friend, Op. cit., p. 5.

⁹⁸⁷ Bullet points quoted verbatim from: "Scheduling for Success: Common Planning Time," Op. cit.

⁹⁸⁸ Howard, L. and E.A. Potts. "Using Co-Planning Time: Strategies for a Successful Co-Teaching Marriage." *TEACHING Exceptional Children Plus*, 5:4, 2009. <https://files.eric.ed.gov/fulltext/EJ967747.pdf>

Checklist for Using Co-Teacher Planning Time Effectively

| FOCUS AREAS | COMPONENTS |
|---|--|
| Standards | <input type="checkbox"/> Use the standards as the focal point of the lesson. <input type="checkbox"/> Include opportunities to connect to IEP goals. |
| Assessment | <input type="checkbox"/> Start with the end in mind. <input type="checkbox"/> Include formative assessment. <input type="checkbox"/> Include summative assessment. <input type="checkbox"/> Assess in a variety of formats. <ul style="list-style-type: none"> <input type="checkbox"/> Paper and pencil. <input type="checkbox"/> Project-based. <input type="checkbox"/> Oral. <input type="checkbox"/> Presentations. <input type="checkbox"/> Agree on grading procedures: <ul style="list-style-type: none"> <input type="checkbox"/> How much to assign. <input type="checkbox"/> How often to assign. <input type="checkbox"/> How to grade. <input type="checkbox"/> Accepting late work. <input type="checkbox"/> Procedures for turning in homework. |
| Accommodations/ modification | <input type="checkbox"/> Address any non-content-related IEP goals. <input type="checkbox"/> Address appropriate content-related IEP goals. <input type="checkbox"/> Consider needs of individual students for assignments and classwork. <input type="checkbox"/> Discuss how to provide accommodations/modifications without alienating students with disabilities. |
| Instructional Strategies | <input type="checkbox"/> Consider including: <ul style="list-style-type: none"> <input type="checkbox"/> Mnemonics. <input type="checkbox"/> Graphic organizers. <input type="checkbox"/> Cooperative learning strategies. <input type="checkbox"/> Progress monitoring. <input type="checkbox"/> Peer-assisted learning strategies. |
| Logistics | <input type="checkbox"/> Determine who will prepare: <ul style="list-style-type: none"> <input type="checkbox"/> Materials. <input type="checkbox"/> Tests. <input type="checkbox"/> Plan for: <ul style="list-style-type: none"> <input type="checkbox"/> Seating. <input type="checkbox"/> Roles in instruction. <input type="checkbox"/> Roles in discipline. <input type="checkbox"/> Classroom movement patterns. |

Source: *Teaching Exceptional Children Plus*⁹⁸⁹

STAFFING CONSIDERATIONS

PARAPROFESSIONAL SUPPORT

Paraprofessionals play a vital role in all special education models.⁹⁹⁰ A paraprofessional is “a school employee who works alongside and under the supervision of a licensed or certificated educator to support and assist in

⁹⁸⁹ Figure contents quoted verbatim from: Ibid., p. 7.

⁹⁹⁰ Cipriano et al., Op. cit., p. 5.

providing instructional and other services to children, youth, and their families.”⁹⁹¹ “Paraprofessional” is not a universal term, and other common titles for the position include:⁹⁹²

- Classroom assistant
- Educational assistant
- Instructional aide or assistant
- Paraeducator
- Teacher assistant
- Teacher aide

To support a shared purpose, teachers and paraprofessionals should align expectations, use “we” language (i.e., “we expect” instead of “I expect”), and reiterate and clarify one another’s instructions to students.⁹⁹³ Teachers also should use verbal instructions and gesticulatory cues to delegate tasks to paraprofessionals.⁹⁹⁴ While the teacher provides differentiated instruction, paraprofessionals may complete other instructional tasks, manage behavior, or fulfill administrative duties.⁹⁹⁵

PROFESSIONAL DEVELOPMENT

The literature identifies three common themes for successful professional development in special education: **engagement, reflection, and empowerment**. These themes, described in figure below, draw on similar strategies for facilitating teacher collaboration and building coaching relationships.

Common Themes in Effective Professional Development Programs

| Engagement | Reflection | Empowerment |
|---|---|---|
| <ul style="list-style-type: none"> • For professional development to be effective and impactful, teachers need to be highly engaged in the professional development process. • Creating a culture of collaboration and providing ongoing support and follow-up meetings increases teacher engagement. | <ul style="list-style-type: none"> • Self-reflection on individual activities and lessons provides a framework for meaningful and sustainable professional growth. • Effective professional development allows teachers to set their own goals, provides them with time to self-evaluate, and offers opportunities for peer coaches to provide feedback and support during the process. | <ul style="list-style-type: none"> • Meaningful and sustainable professional development empowers teachers to engage and collaborate with their colleagues rather than work in isolation. • Learning differentiated instruction techniques empower special education teachers to refine their pedagogy. |

Source: *International Journal of Whole Schooling*⁹⁹⁶

Professional development is most effective when “embedded in the daily work of teaching and learning...and cultivated by a community that includes mentors, colleagues, coaches, and administrators.”⁹⁹⁷ Teachers may collaboratively identify professional development needs and choose activities to address those areas.⁹⁹⁸ For example, teachers may explore instructional strategies and resources to support students with disabilities.⁹⁹⁹ During coaching sessions, teachers in mentoring arrangements may receive more targeted feedback on their

⁹⁹¹ “Paraeducator Roles and Responsibilities.” National Education Association. <http://www.nea.org//home/20783.htm>

⁹⁹² Ibid.

⁹⁹³ Cipriano et al., Op. cit., pp. 12–13.

⁹⁹⁴ Ibid., p. 14.

⁹⁹⁵ Cipriano et al., Op. cit., pp. 14–15.

⁹⁹⁶ Nishimura, T. “Effective Professional Development of Teachers: A Guide to Actualizing Inclusive Schooling.” *International Journal of Whole Schooling*, 10:1, 2014. p. 28. <http://eric.ed.gov/?id=EJ1016781>

⁹⁹⁷ Jorgensen, C.M. et al. “Essential Best Practices in Inclusive Schools.” National Center on Inclusive Education, 2012. p. 14. http://www.sau29.org/UserFiles/Servers/Server_196735/File/Departments/Special%20Education/Special%20Education/Essential%20Best%20Practices%20in%20Inclusive%20Schools.pdf

⁹⁹⁸ Jenkins, A.A. and J. Yoshimura. “Not Another Inservice!: Meeting the Special Education Professional Development Needs of Elementary General Educators.” *Teaching Exceptional Children*, 42:5, 2010. p. 42. http://ecs.schoolwires.com/cms/lib6/NY01000644/Centricity/Domain/20/Not_Another_Inservice!_Meeting_the_Special_Education_Professional_Development_Needs_of_Elementary_General_Educators.pdf

⁹⁹⁹ Nishimura, Op. cit., p. 22.

instructional practice based on classroom observations.¹⁰⁰⁰ Veteran teachers typically mentor less experienced teachers, offering guidance on supporting students, teaching the curriculum, and fulfilling professional duties.¹⁰⁰¹ The figure below gives an overview of the mentor's role in each area. For example, to support students, a mentor may help his/her mentee learn how to manage student behavior in the classroom.

Role of Mentor by Category

| STUDENTS | CURRICULUM | PROFESSIONAL DUTIES |
|--|--|---|
| <ul style="list-style-type: none"> Observe student behavior with specific focus and provide teacher with recorded data. Collaboratively analyze student work. Help design rubrics for behavior and content areas. Help in developing classroom management system. Assist in developing classroom student profile. Share ideas for instructional strategies, accommodations, and modifications to meet student needs. Help design, organize, and set up classroom. | <ul style="list-style-type: none"> Collaboratively plan lessons and units of study based on grade level and ELL standards. Find and provide content resources. Observe instruction and facilitate reflection and determining of next steps. Provide information on differentiating instruction. Model lesson that includes pre- and post-conference. Organize classroom visitations to veteran teacher classrooms. Help prioritize and determine ordering budget materials. | <ul style="list-style-type: none"> Facilitate communication between teacher, administrators, parents, and specialists. Facilitate self-assessment and goal setting based on teaching standards. Advocate for teacher with administrators. Help plan and organize for parent communication. Assist in determining school and community resources. Provide examples of Back-to-School organization, agenda, and handout. Assess students and develop IEPs. |

Source: *National Teacher Education Journal*¹⁰⁰²

The literature associates five steps—readiness, planning, training, implementation, and maintenance—with developing and delivering effective professional development.¹⁰⁰³ In a 2010 study published in *Teaching Exceptional Children*, Jenkins and Yoshimura monitored activities completed by Sunshine Elementary School when implementing a professional development program for teachers of students with disabilities in an inclusive setting.¹⁰⁰⁴ The following figure details the smaller tasks associated with designing and delivering professional development and tracks how Sunshine Elementary School successfully completed the process.

Designing and Delivering Professional Development

| MODEL ACTIVITIES | EXAMPLE ACTIVITIES |
|---|---|
| Step 1: Readiness | |
| <ul style="list-style-type: none"> Conduct awareness-building activities Identify broad goals for the professional development activity | <ul style="list-style-type: none"> Goal: Identify and address teachers' needs in teaching students with disabilities in the general education classroom. |
| Step 2: Planning | |

¹⁰⁰⁰ Ibid.

¹⁰⁰¹ Madigan, J.C. and G. Scroth-Cavataio. "Support for the Beginning Special Educator Through High Quality Mentoring." *National Teacher Education Journal*, 5:1, Winter 2012. p. 107. https://works.bepress.com/jennifer_madigan/2/

¹⁰⁰² Table contents taken verbatim from: Ibid., p. 110.

¹⁰⁰³ Jenkins and Yoshimura, Op. cit., pp. 38–39.

¹⁰⁰⁴ Ibid., p. 38.

| MODEL ACTIVITIES | EXAMPLE ACTIVITIES |
|--|--|
| <ul style="list-style-type: none"> Translate broad goals into detailed plans Build a planning team | <ul style="list-style-type: none"> A group of teachers met to identify their needs and plan an appropriate professional development activity addressing their needs. To identify needs, teachers used a 48-item survey developed from the Interstate Teacher Assessment and Support Consortium (InTASC) standards to determine the teachers' level of confidence in teaching students with disabilities. |
| Step 3: Training | |
| <ul style="list-style-type: none"> Put plans into practices Space activities over time to promote integration of knowledge into classroom practice | <ul style="list-style-type: none"> The same group of teachers met to brainstorm a number of possible activities. Among the list they developed through brainstorming, they picked the least intrusive and most practical one for their purposes: creating concise, easy-to-read research briefs on instructional practices for teaching students with disabilities. |
| Step 4: Implementation | |
| <ul style="list-style-type: none"> Provide support for teachers while they integrate professional development activities into their classroom practice | <ul style="list-style-type: none"> The briefs were distributed to teachers and the coordinator met with individual teachers informally to answer questions and provide additional explanation. |
| Step 5: Maintenance | |
| <ul style="list-style-type: none"> Provide continuous monitoring and reassessment. Encourage self-reflection | <ul style="list-style-type: none"> At the end of six weeks, the coordinator followed up with individual teachers to find out the impact of the briefs. As a means of follow-up and reassessment, the coordinator used a one-page questionnaire encouraging teachers to self-reflect. |

Source: *Teaching Exceptional Children*¹⁰⁰⁵

TEACHER SATISFACTION AND RETENTION

Districts across the country experience a shortage of special education teachers, with many special education teachers leaving due to low job satisfaction.¹⁰⁰⁶ However, districts can positively influence the satisfaction and retention of special education teachers. For example, a 2015 literature review found that administrative support, comprehensive and targeted induction programs, and mentoring positively impact the satisfaction and retention of special education teachers, while factors such as stress and workload negatively impact special education teacher job satisfaction.¹⁰⁰⁷ Similarly, in a 2013 *Education and Treatment of Children* study, researchers also found that administrative support is critical to satisfaction, concluding that the most relevant variables that affect special education teachers' job satisfaction and view of their school include guidance and feedback, trust, and opportunities for growth.¹⁰⁰⁸ Additionally, using a nationally representative sample of 2,060 secondary school special education teachers, a 2017 *Educational Management Administration & Leadership* study found that administrative support and team efficacy had the largest impact on special education teacher satisfaction and commitment.¹⁰⁰⁹

¹⁰⁰⁵ Ibid., pp. 38–39.

¹⁰⁰⁶ [1] Vittek, J.E. "Promoting Special Educator Teacher Retention: A Critical Review of the Literature." *SAGE*, 5:2, 2015. pp. 1–2. Accessed via SagePub. [2] Cancio, E.J., S.F. Albrecht, and B.H. Johns. "Defining Administrative Support and Its Relationship to the Attrition of Teachers of Students with Emotional and Behavioral Disorders." *Education & Treatment of Children*, 36:4, November 2013. Accessed via ProQuest.

¹⁰⁰⁷ Vittek, Op. cit., pp. 2–4.

¹⁰⁰⁸ Cancio, Albrecht, and Johns, Op. cit., p. 85.

¹⁰⁰⁹ Conley, S. and S. You. "Key Influences on Special Education Teachers' Intentions to Leave: The Effects of Administrative Support and Teacher Team Efficacy in a Mediation Model." *Educational Management Administration & Leadership*, 45:3, May 1, 2017. Accessed via SagePub.

IMPROVING SPECIAL EDUCATION STUDENT OUTCOMES

This section discusses strategies for improving special education student outcomes, including improving academic achievement, raising attendance, and decreasing disciplinary incidents.

IMPROVING ACADEMIC ACHIEVEMENT

The following subsections offer instructional strategies for improving the reading and math achievement of students with disabilities.

READING INSTRUCTION

The U.S. Department of Education's Institute of Education Sciences (IES) has [synthesized](#) research on different types of interventions that improve reading outcomes for students with reading disabilities, noting that:¹⁰¹⁰

- Increasing the intensity of interventions in kindergarten and Grade 1 can prevent reading difficulties for many students;
- Fluency interventions that focus on repeated reading of text, opportunities to practice reading in the classroom, and reading a range of texts can generally improve students' fluency and comprehension;
- Language outcomes for many preschool children at risk for language disabilities can improve if they are provided extensive opportunities to hear and use complex oral language;
- Peer-assisted or cooperative learning is a promising method to increase the intensity of instruction for students and improving their reading outcomes; and
- Instruction and interventions that are differentiated to target an individual student's profile of component skills are effective in improving students' reading development.

To translate these broad findings into specific action, the Best Evidence Encyclopedia (BEE), a web-based resource funded by the U.S. Department of Education, [reviews and rates research on educational interventions](#). The BEE identified 96 studies that evaluated interventions for struggling readers and met its inclusion criteria. The researchers found that one-on-one tutoring programs are highly effective, and are more effective than small group tutorials in phonics, especially when provided by teachers rather than paraprofessionals or volunteers. The BEE noted that "[t]raditional computer-assisted instruction programs have little impact on reading."¹⁰¹¹ The researchers divided the interventions into six models, presented in the figure below, along with example programs that showed effects for low achievers.

Types of Program Interventions to Improve Reading Achievement

| PROGRAM CATEGORY | AVERAGE EFFECT SIZE | PROGRAM EXAMPLES |
|---|------------------------|--|
| One-to-One Tutoring by Teachers | ES=+0.38 in 19 studies | Reading Recovery, Auditory Discrimination in Depth, Early Steps/Howard Street Tutoring, and Targeted Reading Intervention. |
| One-to-One Tutoring by Paraprofessionals and Volunteers | ES=+0.24 in 18 studies | Sound Partners, SMART, and Book Buddies |
| Small Group Tutorials | ES=+0.31 in 20 studies | Corrective Reading, Quick Reads, Voyager Passport, and PHAST Reading. |

¹⁰¹⁰ Bullet points quoted verbatim from: Connor, C.M. et al. "Improving Reading Outcomes for Students with or at Risk for Reading Disabilities: A Synthesis of the Contributions from the Institute of Education Sciences Research Centers." Institute of Education Sciences, 2014. p. x. <https://ies.ed.gov/ncser/pubs/20143000/pdf/20143000.pdf>

¹⁰¹¹ "Struggling Readers: Review Summary." Best Evidence Encyclopedia, 2009. <http://www.bestevidence.org/reading/strug/summary.htm>

| PROGRAM CATEGORY | AVERAGE EFFECT SIZE | PROGRAM EXAMPLES |
|--|------------------------|---|
| Classroom Instructional Process Approaches | ES=+0.58 in 8 studies | Cooperative Integrated Reading and Composition, PALS, Direct Instruction, and Project Read. |
| Classroom Instructional Process Programs with Tutoring | ES=+0.55 in 9 studies | Success for All |
| Instructional Technology | ES=+0.09 in 14 studies | Jostens/Compass Learning, Fast ForWord, and Lexia |

Source: Best Evidence Encyclopedia¹⁰¹²

Best practice recommendations and empirical studies consistently find that explicit (or direct) instruction is a highly effective method for teaching students with disabilities both word recognition and reading comprehension strategies. For instance, Reading Rockets, a research-based literacy initiative, states that “[d]irect instruction refers to teaching skills in an explicit, direct fashion. It involves drill/repetition/practice and can be delivered to one child or to a small group of students at the same time.”¹⁰¹³ One study finds that the reading achievement of students with disabilities improves when they are taught metacognitive strategies used by good readers. The authors write that “many reading difficulties may be rooted in not knowing how or when to use a strategy, rather than in deficient memory or learning capacity.”¹⁰¹⁴

Instructional components of direct instruction for reading comprehension include directed response/questioning where the teacher asks questions and encourages students to ask questions, provides assistance and scaffolds learning, and models steps. Additionally, strategy instruction teaches students “to search for patterns in words and to identify key passages (paragraph or page) and the main idea in each.”¹⁰¹⁵ Methods for improving word recognition of students with disabilities through explicit instruction are presented in the following figure.

Instructional Components for Increasing Word Recognition Skills in Students with Disabilities

| COMPONENT | TEACHER ACTIONS |
|---------------------|---|
| Sequencing | <ul style="list-style-type: none"> Breaks down the task (e.g., starts by having the child break an unknown word into separate sounds or parts they can sound out). Gradually reduces prompts or cues. Matches the difficulty level to the task and to the student. Sequences short activities (e.g., first spends 10 minutes reviewing new words from a previous lesson, then 5 minutes underlining new words in the passage, and finally 5 minutes practicing blends). Uses step-by-step prompts. |
| Segmentation | <ul style="list-style-type: none"> Breaks down the targeted skill (e.g., identifying a speech or letter sound) into smaller units or component parts (e.g., sounding out each speech or letter sound in that word). Segments or synthesizes component parts (e.g., sounds out each phoneme in a word, then blends the sounds together). |
| Advanced Organizers | <ul style="list-style-type: none"> Directs children to look over material prior to instruction. Directs children to focus on particular information. Provides students with prior information about tasks. Tells students the objectives of instruction upfront. |

Source: Reading Rockets¹⁰¹⁶

¹⁰¹² “Reading / Struggling Readers.” Best Evidence Encyclopedia, 2009. http://www.bestevidence.org/reading/strug/strug_read.htm

¹⁰¹³ Stanberry, K. and L. Swanson. “Effective Reading Interventions for Kids with Learning Disabilities.” Reading Rockets, 2009. <http://www.readingrockets.org/article/effective-reading-interventions-kids-learning-disabilities>

¹⁰¹⁴ Schmidt, R.J., M.S. Rozendal, and G.G. Greenman. “Reading Instruction in the Inclusion Classroom: Research-Based Practices.” *Remedial & Special Education*, 23:3, June 2002. p. 131. Accessed via EbscoHost.

¹⁰¹⁵ Stanberry and Swanson, Op. cit.

¹⁰¹⁶ Figure reproduced verbatim from: Ibid.

MATHEMATICS INSTRUCTION

Research consistently finds that explicit and systematic instruction is also highly effective for improving the mathematics achievement of students with disabilities. For example, an article in the journal *Teaching Exceptional Children* explains that an explicit approach to math instruction “provide[s] in-depth coverage of the most critical content areas of mathematics and reflect[s] current research on effective mathematics instruction.”¹⁰¹⁷ Additionally, in its 2008 report, the National Mathematics Advisory Panel (NMAP) reports that explicit systematic instruction improves math achievement for students with learning disabilities in the areas of word problems, computation, and transferring known skills to novel situations.¹⁰¹⁸ The NMAP describes explicit instruction as including the following requirements:¹⁰¹⁹

- Teachers provide clear models for solving a problem type using an array of examples;
- Students receive extensive practice in use of newly learned strategies and skills;
- Students are provided with opportunities to think aloud (i.e., talk through the decisions they make and the steps they take); and
- Students are provided with extensive feedback.

Following the NMAP’s findings, a guide published by the IES finds strong evidence for explicit and systematic mathematics instruction as a key recommendation for teaching students with learning disabilities and students struggling with math. To provide explicit and systematic mathematics instruction, the IES (following the recommendations of the NMAP) asserts that teachers should:¹⁰²⁰

- Ensure that instructional materials are systematic and explicit. In particular, they should include numerous clear models of easy and difficult problems, with accompanying teacher think-alouds;
- Provide students with opportunities to solve problems in a group and communicate problem-solving strategies; and
- Ensure that instructional materials include cumulative review in each session.

Explicit instruction must cover strategies for approaching different types of math problems. For example, an *Education and Training in Autism and Developmental Disabilities* literature review of empirical studies on mathematical interventions that had positive outcomes for students with ASD and other learning disabilities found that, of the 11 studies that met their criteria for inclusion, about half provided a form of cognitive or meta-cognitive strategy instruction. The authors defined a cognitive strategy as “a series of sequenced procedures that permit a student to complete a task effectively using rules, processes, and steps that are applied systematically to obtain a problem solution, and include the metacognitive elements of when and where to apply specific strategies in the implementation and evaluation of the process and outcome.”¹⁰²¹

The IES guide recommends that strategies for solving word problems should be based on their “common underlying structures,” and that students should be taught to recognize the common underlying structure of familiar and unfamiliar word problems so that they can apply their knowledge of how to solve underlying

¹⁰¹⁷ Doabler, C.T. et al. “Enhancing Core Mathematics Instruction for Students at Risk for Mathematics Disabilities.” *Teaching Exceptional Children*, 44:4, April 2012. p. 48. Accessed via ProQuest.

¹⁰¹⁸ Faulkner, L. et al. “The Final Report of the National Mathematics Advisory Panel.” U.S. Department of Education, 2008. p. 48. <https://www2.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf>

¹⁰¹⁹ Bullet points quoted verbatim from: Ibid., p. xxiii.

¹⁰²⁰ Bullet points quoted verbatim from: Gersten, R. et al. “Assisting Students Struggling with Mathematics: Response to Intervention (RTI) for Elementary and Middle Schools.” U.S. Department of Education, Institute of Education Sciences, April 2009. pp. 21–24. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/rti_math_pg_042109.pdf

¹⁰²¹ Barnett, J.E.H. and S. Cleary. “Review of Evidence-Based Mathematics Interventions for Students with Autism Spectrum Disorders.” *Education and Training in Autism and Developmental Disabilities*, 50:2, June 2015. p. 174. Accessed via ProQuest.

structures of familiar problems to new, unfamiliar problems. Similarly, teachers should also instruct students on how to categorize word problems based on their structure and how to determine solutions accordingly.¹⁰²²

One strategy to assist students in solving word problems is RIDE, an acronym describing the following process:¹⁰²³

- **R:** Remember the problem correctly;
- **I:** Identify the relevant information;
- **D:** Determine the operations and unit for expressing the answer; and
- **E:** Enter the correct numbers, calculate, and check the answer.

RIDE can be helpful for students who struggle with abstract reasoning, attention, memory, and visual-spatial skills. The Center for Learning Disabilities recommends visually displaying strategies such as RIDE in the classroom and demonstrating how to perform each step.¹⁰²⁴

The *Education and Training in Autism and Developmental Disabilities* literature review also found that about half of the reviewed studies used *visual* strategies to help students develop math skills.¹⁰²⁵ The most common types of visual aids are drawings, number lines, diagrams, and graphs.¹⁰²⁶ Similarly, the Center on Instruction recommends teaching students to visually represent information when solving a math problem, arguing that the systematic use of visuals positively affects the math outcomes of students with disabilities by clarifying and simplifying problems. However, the authors note that visuals should be used alongside explicit instruction. Empirical studies find that visual aids are more effective when used by both the teacher and the student, and that the most effective visuals address a specific problem type.¹⁰²⁷

Teaching specific math language and vocabulary is another strategy to improve the math achievement of students with disabilities, which works well in inclusion settings. Mathematical language and vocabulary are essential for understanding math in oral and written forms, especially for students with math disabilities. An article in *Teaching Exceptional Children* emphasizes the significance of teaching children clear and concise math language to facilitate conceptual and procedural understanding. The authors argue that using imprecise math language, often with the intention of simplifying math language for students with disabilities, contributes to students' math struggles. The authors write:¹⁰²⁸

Children should learn mathematics skills in accurate contexts that provide a solid foundation on which to build more complex skills in later grades. Therefore, teaching language that is mathematically correct and holds true across grade levels can help children generalize mathematics across concepts.

The following figure highlights three strategies provided by the Council for Learning Disabilities for teaching math vocabulary to students with disabilities. Notably, these strategies combine visual and vocabulary strategies.

¹⁰²² Gersten et al., Op. cit., pp. 26–28.

¹⁰²³ Hott, B., L. Isbell, and T. Montani. "Strategies and Interventions to Support Students with Mathematics Disabilities." Center for Learning Disabilities, 2014. p. 2. http://www.council-for-learning-disabilities.org/wp-content/uploads/2014/12/Math_Disabilities_Support.pdf

¹⁰²⁴ Ibid.

¹⁰²⁵ Barnett and Cleary, Op. cit., p. 174.

¹⁰²⁶ Ibid.

¹⁰²⁷ Jayanthi, M., R. Gersten, and S. Baker. "Mathematics Instruction for Students with Learning Disabilities or Difficulty Learning Mathematics." Center on Instruction, 2008. p. 8. <http://www.centeroninstruction.org/files/Mathematics%20Instruction%20LD%20Guide%20for%20Teachers.pdf>

¹⁰²⁸ Hughes, E.M., S. Powell, and E. Stevens. "Supporting Clear and Concise Mathematics Language: Instead of That, Say This." *Teaching Exceptional Children*, 49:1, September 2016. pp. 8–9. Accessed via ProQuest.

Strategies to Support Vocabulary Development

| STRATEGY | EXAMPLE |
|----------------------|---|
| Pre-teach Vocabulary | <ul style="list-style-type: none"> Use representations, both pictorial and concrete, to emphasize the meaning of math vocabulary. Pretest students' knowledge of glossary terms in their math textbook and teach vocabulary that is unknown or incorrect. |
| Mnemonic Techniques | <ul style="list-style-type: none"> Teach mnemonic techniques to help remember word meanings. Use mnemonic instruction to help students improve their memory of new information. |
| Key Word Approach | <ul style="list-style-type: none"> Use the keyword approach (e.g., visualize a visor as the keyword for divisor; visualize quotation marks as the keyword for quotient). |

Source: Council for Learning Disabilities¹⁰²⁹

RAISING ATTENDANCE

SCHOOLWIDE STRATEGIES

To improve attendance among students receiving special education services and other students at risk for chronic absenteeism, **schools should implement a multi-tiered system of supports that range from improvements in school climate to coordinated school and interagency responses.** Attendance Works, a national and state initiative that promotes awareness of the impact of attendance on academic success, recommends that schools adopt a comprehensive, multi-tiered system to improve attendance. In this approach, Tier 1 represents universal strategies to promote good attendance habits, while Tiers 2 and 3 represent more targeted, intensive strategies for at-risk students (see the figure below). To target resources toward chronically absent and at-risk students, school and district leaders require the appropriate data to (1) identify and (2) regularly monitor these students.¹⁰³⁰

Multi-Tiered System of Supports to Reduce Chronic Absence

| TIER | ABSENCE RATE | STRATEGIES |
|--------|---|--|
| Tier 1 | <ul style="list-style-type: none"> Students missing less than 5% (satisfactory) Students missing 5-9% (at-risk) | <ul style="list-style-type: none"> Engaging school climate Positive relationships with students and families Impact of absences on achievement widely understood Chronic absence data monitored Good and improved attendance required Common barriers identified and addressed |
| Tier 2 | <ul style="list-style-type: none"> Students missing 10-19% (moderate chronic absence) | <ul style="list-style-type: none"> Personalized early outreach Action plan addresses barriers and increases engagement Caring mentors |
| Tier 3 | <ul style="list-style-type: none"> Students who missed 20% or more of school (severe chronic absence) | <ul style="list-style-type: none"> Coordinated school and interagency response Legal intervention (last resort) |

Source: Attendance Works¹⁰³¹

Similarly, in a 2012 report from the Center for Social Organization of Schools at Johns Hopkins University, Balfanz and Byrnes observe that **“vigorous and comprehensive efforts to get more students to attend school**

¹⁰²⁹ Figure reproduced verbatim from: Hott, Isbell, and Montani, Op. cit., p. 4.

¹⁰³⁰ “Preventing Missed Opportunity: Taking Collective Action to Confront Chronic Absence.” Attendance Works, 2016. p. 20.
http://www.attendanceworks.org/wordpress/wp-content/uploads/2016/08/PreventingMissedOpportunityFull_FINAL9.8.16_2.pdf

¹⁰³¹ Figure adapted from: “Tiered System of Supports for Improving Attendance.” Attendance Works.
<http://www.attendanceworks.org/tools/schools/3-tiers-of-intervention/>

regularly pay off.”¹⁰³² While acknowledging that “chronic absenteeism is largely an overlooked phenomenon” at the national and state levels (as well as, often, at the local level), the authors find multiple examples of programs that effectively reduce absenteeism, all of which share the characteristics listed in the figure below.¹⁰³³

Characteristics of Programs that Effectively Reduce Absenteeism

- Close, often weekly, measurement and tracking of absenteeism.
- The development of a diagnostic capacity to understand why students are missing school.
- A problem-solving capacity to help address those reasons.
- Building and sustaining relationships with the students who are experiencing absenteeism, and often their families.
- The development of a multi-sector and community response that often involves a second shift of adults in the schools with the highest levels of chronic absenteeism to meet the scale of the challenge.
- Efforts to recognize and reward good attendance.
- A commitment to learn what works, and then to replicate and expand effective programs to modify what is not working.

Source: Center for Social Organization of Schools¹⁰³⁴

TEACHER-IMPLEMENTED STRATEGIES

A majority of students with disabilities spend more than 80 percent of their time in general education classrooms. Thus, **strategies for raising attendance recommended to general education teachers are likely relevant for both general and special education students.**¹⁰³⁵ Notably, few studies specifically examine the impact of attendance on special education students. Further, the literature does not appear to provide targeted strategies for this subpopulation.¹⁰³⁶

Teachers in inclusive settings should emphasize the importance of regular attendance both in class and during interactions with families.¹⁰³⁷ Attendance Works recommends that from the start of the school year (or even over the summer), teachers develop a culture that promotes regular attendance and create a welcoming school environment.¹⁰³⁸ Teachers should build relationships with parents or guardians before attendance problems manifest and provide families with “meaningful opportunities for their involvement.”¹⁰³⁹ The following figure lists specific strategies teachers can implement to support positive attendance habits.¹⁰⁴⁰

¹⁰³² Balfanz, R. and V. Byrnes. “The Importance of Being in School: A Report on Absenteeism in the Nation’s Public Schools.” Center for Social Organization of Schools, 2012. p. 33. http://new.every1graduates.org/wp-content/uploads/2012/05/FINALChronicAbsenteeismReport_May16.pdf

¹⁰³³ Ibid.

¹⁰³⁴ Figure bullets quoted verbatim from: Ibid.

¹⁰³⁵ Dudley-Marlong, C. and M. Burns. “Two perspectives on inclusion in The United States.” *Global Education Review*, 1:1, 2014. p. 14. <http://files.eric.ed.gov/fulltext/EJ1055208.pdf>

¹⁰³⁶ Rudzki, D. “The Extent of Programs, Services, and Attendance for Students with Reading Disabilities and Performance on High-Stakes Reading Assessments.” Oakland University, 2015. pp. 44–45. <https://search.proquest.com/docview/1788597028/previewPDF/7FB73DC6D5ED45BAPQ/7?accountid=132487>

¹⁰³⁷ “Best Practices and Model Truancy Programs.” National Dropout Prevention Center/Network, 2005. p. 14. <http://files.eric.ed.gov/fulltext/ED491287.pdf>

¹⁰³⁸ “Teaching Attendance 2.0 Summary: Strategies to Help Educators Infuse Attendance into Everyday Activities.” Attendance Works, May 2017. pp. 2–3. http://attendanceworks.org/wp-content/uploads/2017/09/Teaching-Attendance2.0-Summary_final.pdf

¹⁰³⁹ “Best Practices and Model Truancy Programs,” Op. cit., p. 18.

¹⁰⁴⁰ Note that Attendance Works also supplies a variety of resources to support teachers in implementing these strategies, from talking points for interacting with families, to attendance worksheets, to informational flyers on the importance of regular attendance: “Teaching Attendance: Everyday Strategies to Help Teachers Improve Attendance and Raise Achievement.” Attendance Works, 2014. pp. 3–7. <http://www.attendanceworks.org/wordpress/wp-content/uploads/2010/05/AWTeacherToolkit-August-2014-new2.pdf>

Teacher-Implemented Strategies to Increase Student Attendance

| STRATEGY | DESCRIPTION AND SUB-STRATEGIES |
|---|--|
| Emphasize attendance from day one | <ul style="list-style-type: none"> ▪ Talk with parents early in the school year or, if possible, during the summer to share the value of good attendance and let them know that you are there to help support them. ▪ Send home handouts and infographics with information and tips about attendance. ▪ Consider showing a video, using an exercise to demonstrate the importance of attendance, or asking parents to sign a pledge card. ▪ Get involved in Attendance Awareness Month. Throughout the month of September, 40 national organizations come together to celebrate Attendance Awareness Month. Join the schools and communities hosting events, launching contests or spreading the word. |
| Use parent-teacher conferences to talk about attendance | <ul style="list-style-type: none"> ▪ Parent-teacher conferences are an ideal time to talk to parents about the importance of regular attendance (starting as early as kindergarten and even in prekindergarten). Teachers should use conferences to: ▪ Help families learn about the positive impact of good attendance and the negative effects of chronic absenteeism on realizing their hopes and dreams for their children. ▪ Help families brainstorm how they can establish habits and routines at home that will put them on the right track to good school attendance, such as having a regular bedtime and laying out clothes and backpacks the night before. ▪ Help establish and maintain ongoing two-way communication with parents to recognize good and improved attendance as well as identify barriers – such as transportation issues, job loss, unstable housing arrangements or health concerns. |
| Promote a culture of attendance | <ul style="list-style-type: none"> ▪ Promote good attendance habits among students by: ▪ Greeting students warmly in the morning, taking attendance daily and asking about them when they come back after an absence. ▪ Engaging the students in tracking their own attendance. ▪ Hanging posters. ▪ Offering incentives for good or improved attendance, whether a good star, a certificate or a monthly celebration. Make sure to let the parents know so they can feel proud of their children! ▪ Make data work for you: ▪ Review your attendance data to look for patterns in who is absent and what days are most frequently missed. Look at excused as well as unexcused absences. ▪ Look for absenteeism spikes, which often come around holidays. ▪ Encourage your principal or superintendent to track chronic absence data more broadly and look for systemic problems. ▪ Use community partners: ▪ Evaluate possible barriers to attendance that lie beyond the classroom, such as health, transportation, and housing problems. ▪ Engage community partners who can help. Encourage your school to develop a sheet of resources for families who need support. |

Source: Attendance Works¹⁰⁴¹

Teachers also should recognize and reward good attendance habits, as well as contact parents by phone each day a student is absent. While incentives can establish an atmosphere that values regular attendance, teachers should not rely on rewards as their *only* strategy for increasing attendance. The REL Northwest identifies several strategies, in addition to those cited by Attendance Works, that individual staff members can enact to directly and indirectly affect students' attendance habits.¹⁰⁴² These strategies appear in the figure below.

¹⁰⁴¹ Figure content quoted verbatim with minor changes from: Ibid.

¹⁰⁴² Railsback, J. "Increasing Student Attendance: Strategies from Research and Practice." Northwest Regional Educational Laboratory, 2004. p. 38. <http://educationnorthwest.org/sites/default/files/increasing-student-attendance.pdf>

Additional Recommendations for Teachers and Other Staff Members

| STRATEGY | DESCRIPTION |
|---|---|
| Create a welcoming atmosphere | Make students and their families feel welcome. Greeting them when they arrive and posting signs in their native language are just a couple of ways to communicate to parents and students that they are valued members of the school community. |
| Contact parents of absent students | When a student is absent, immediately talk to their family member in person—by personal phone call during the day or the evening. |
| Discuss absences with students | Let children know that when they are not in school, they are missed. Talk to them about why they were gone, and if there is anything you can do to help. |
| Have high expectations | Teachers can provide high expectations for all students, guide students in focusing on their strengths, and challenge students to work beyond what they think they can do. |
| Foster collaboration | Create shared learning opportunities for students to work together—either during whole-group or small-group lessons, or with peer tutoring. Some research indicates that this encourages students' motivation and engagement. |

Source: Northwest REL¹⁰⁴³

To promote engagement and improve attendance, teachers and staff members should build meaningful relationships with students with disabilities. The REL Northwest notes that “perhaps the most important finding in research concerning dropout prevention, attendance, student engagement, and effective small schools is that students are more likely to remain and achieve in schools where people care about them.”¹⁰⁴⁴ Mentoring and student advisories are two recommended strategies to encourage positive relationships between students and school staff members:¹⁰⁴⁵

- **Mentoring programs** provide one-on-one supportive relationships by connecting students with an adult and help motivate students to attend school. There are many types of mentoring programs, ranging from community-based to peer mentoring and e-mentoring. Often, mentoring programs are coupled with tutoring initiatives to bolster academic achievement. Mentors provide students with positive role models who help the student navigate his or her way towards academic success. They typically provide academic support, advocate for the student, and connect the student with additional resources.
- **Student advisories** similarly provide students with an adult “who will assist in providing emotional, academic, and personal support.” Such relationships may be particularly effective in larger middle and high schools, where students find it more difficult to form close relationships with their teachers. A student advisory program often has two components: “a daily period when advisers connect with their students, and an ongoing, consistent, long-term relationship.”

Similarly, small learning communities (SLCs) can create more personalized learning environments with closer relationships among students and teachers. More districts and schools are recognizing the role of SLCs – sometimes referred to as schools-within-a-school, schools-within-a-building, clusters, pods, academies, or houses – in fostering more personalized learning for middle and high school students. While models vary, research indicates that increased personalization corresponds to higher attendance rates.¹⁰⁴⁶

DECREASING DISCIPLINARY INCIDENTS

Across U.S. elementary and secondary schools, students with disabilities are more likely to receive an out-of-school suspension than students without disabilities. During the 2011-12 school year, 5.4 percent of

¹⁰⁴³ Figure bullets quoted verbatim from: Ibid.

¹⁰⁴⁴ Ibid., p. 36.

¹⁰⁴⁵ Bullets adapted from: Ibid., pp. 27–28.

¹⁰⁴⁶ Ibid., pp. 25–26.

elementary school students with disabilities and 18.1 percent of secondary school students with disabilities received an out-of-school suspension. In comparison, 2.6 percent and 10.1 percent of elementary and secondary school students without disabilities received an out-of-school suspension, respectively. In addition, suspensions were distributed disproportionately across students with disabilities, when examined by gender and race. For example, at both the elementary and secondary school levels, male students were more likely to receive a suspension than female students, and Latino and black students were more likely to receive a suspension than their white peers.¹⁰⁴⁷

A positive school climate with supportive, respectful relationships and rigorous academics may help prevent differences in disciplinary referrals across special education students and other student subpopulations. Rather than view discipline in isolation, school leaders need to “consider the conditions for learning and the school climate more broadly.”¹⁰⁴⁸ The Equity Project at Indiana University cautions that “school discipline cannot be viewed in isolation from the rest of schooling” and identifies a series of strategies to address disproportionate disciplinary outcomes that focus on (1) prevention of discipline problems through changes to school climate and (2) effective management of discipline problems through conflict intervention strategies.¹⁰⁴⁹ These principles and strategies appear in the following figure.

Principles and Strategies to Prevent and Address Conflict

| PRINCIPLES | STRATEGIES |
|-------------------------------------|---|
| Principles of Conflict Prevention | <p>Research suggests that to prevent unnecessary discipline and to prevent the overrepresentation of particular groups of children and adolescents in school discipline, educators can equitably offer all students:</p> <ul style="list-style-type: none"> ▪ Supportive relationships (Forge authentic connections with all students). ▪ Academic rigor (Promote the potential of all students, hold high expectations, and provide high-level learning opportunities). ▪ Culturally relevant and responsive teaching (Teaching that responds respectfully to students’ real lives). ▪ Bias-free classrooms and respectful school environments (Create inclusive, positive classroom and school environments in which students feel fairly treated). |
| Principles of Conflict Intervention | <p>Research suggests that when discipline problems arise, educators can engage in equity-driven:</p> <ul style="list-style-type: none"> ▪ Inquiry into the causes of conflicts. ▪ Problem-solving approaches to discipline. ▪ Recognition of student and family voice and their perspectives on conflicts’ causes and solutions. ▪ Re-integration of students after conflict. |

Source: The Equity Project¹⁰⁵⁰

While the Equity Project cites students with disabilities as one of the most likely student subpopulations to experience inequitable disciplinary consequences, the strategies identified in the preceding figure appear focused on addressing gender and racial inequities.¹⁰⁵¹ While the strategies listed above benefit special education students, the following subsections discuss schoolwide and teacher-implemented supports and approaches specifically recommended for a special education setting.

¹⁰⁴⁷ Losen, D. et al. “Are We Closing the School Discipline Gap?” The Center for Civil Rights Remedies, 2015. pp. 4–6. https://www.civilrightsproject.ucla.edu/resources/projects/center-for-civil-rights-remedies/school-to-prison-folder/federal-reports/are-we-closing-the-school-discipline-gap/AreWeClosingTheSchoolDisciplineGap_FINAL221.pdf

¹⁰⁴⁸ Gregory, A., J. Bell, and M. Pollock. “How Educators Can Eradicate Disparities in School Discipline: A Briefing Paper on School-Based Interventions.” The Equity Project, 2014. p. 2. http://www.indiana.edu/~atlantic/wp-content/uploads/2014/12/Disparity_Intervention_Full_121114.pdf

¹⁰⁴⁹ Ibid., pp. 2–3.

¹⁰⁵⁰ Figure adapted from: Ibid., p. 3.

¹⁰⁵¹ Gregory, Bell, and Pollock, Op. cit.

SCHOOLWIDE STRATEGIES

PBIS

Experts recommend implementing a schoolwide Positive Behavioral Interventions and Supports (PBIS) model to support special education students in inclusive classroom environments. PBIS is a three-tiered framework designed to curtail and prevent problem behaviors by affecting positive behavioral change in students that leads to improved socio-emotional, behavioral, and academic outcomes. Within the PBIS framework, Tier 1 supports refer to universal, schoolwide components aimed at preventing negative behavior, while Tier 2 and Tier 3 supports refer to more intensive strategies for select students.¹⁰⁵² The Office of Special Education Programs (OSEP) Technical Assistance Center on PBIS has funded research on PBIS for more than a decade based on the idea that it is a particularly effective model for supporting special education students in inclusive classrooms. However, studies typically examine the effects of PBIS implementation on schoolwide discipline referrals, rather than discipline referrals for special education students.¹⁰⁵³

Research indicates that **early exposure to a schoolwide PBIS model effectively reduces office discipline referrals and other negative disciplinary outcomes for all students, especially high-risk students.** Several randomized controlled trials (RCT) have indicated that a schoolwide PBIS model improves outcomes related to office discipline referrals, suspensions, and teachers' ratings of students' social-emotional and behavioral functioning.¹⁰⁵⁴ For example, a four-year longitudinal RCT of more than 12,000 children across 37 elementary schools published in 2012 indicates that students attending schools with a schoolwide PBIS model were "33 [percent] less likely to receive an office discipline referral than those in the comparison schools."¹⁰⁵⁵ More broadly, students attending schools with schoolwide PBIS showed improved behavior, concentration, social-emotional functioning, and prosocial behavior. Students who were exposed to the schoolwide PBIS model in Kindergarten tended to benefit most.¹⁰⁵⁶ Moreover, in subsequent analyses, the authors find that children with higher risks for negative social-emotional outcomes (e.g., students with behavioral disorders) received the greatest benefit from a schoolwide PBIS model.¹⁰⁵⁷

SEL

Social and emotional learning (SEL) programs may be particularly effective in supporting special education students' social-emotional development which, in turn, can affect disciplinary outcomes. SEL refers to the skills and practical knowledge students need to communicate effectively, interact with peers, resolve conflicts, and manage emotional responses to stressful situations.¹⁰⁵⁸ While few studies examine the impact of SEL on special education students, some findings indicate that a SEL framework can positively impact students' social-emotional skills and their behavioral infractions (as well as attendance habits).¹⁰⁵⁹ The vice president of the Collaborative for Academic, Social, and Emotional Learning (CASEL) notes that "special needs

¹⁰⁵² Bradshaw, C., T. Waasdorp, and P. Leaf. "Examining Variation in the Impact of School-Wide Positive Behavioral Interventions and Supports: Findings From a Randomized Controlled Effectiveness Trial." *Journal of Educational Psychology*, 107:2, 2015. pp. 546–547.

¹⁰⁵³ Tobin, T. et al. "Discipline Referral Rates." OSEP Technical Assistance Center, 2012. http://www.pbis.org/evaluation/evaluation_briefs/nov_12.aspx

¹⁰⁵⁴ Bradshaw, Waasdorp, and Leaf, "Examining Variation in the Impact of School-Wide Positive Behavioral Interventions and Supports: Findings From a Randomized Controlled Effectiveness Trial," Op. cit., p. 547.

¹⁰⁵⁵ Bradshaw, C., T. Waasdorp, and P. Leaf. "Effects of School-Wide Positive Behavioral Interventions and Supports on Child Behavior Problems." *Pediatrics*, 130:5, 2012. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3483890/>

¹⁰⁵⁶ Ibid.

¹⁰⁵⁷ Bradshaw, Waasdorp, and Leaf, "Examining Variation in the Impact of School-Wide Positive Behavioral Interventions and Supports: Findings From a Randomized Controlled Effectiveness Trial," Op. cit., p. 552.

¹⁰⁵⁸ "Social and Emotional Learning." American Institutes for Research. <http://www.air.org/topic/social-and-emotional-learning>

¹⁰⁵⁹ [1] Adams, D. "The Application of Social-Emotional Learning Principles to a Special Education Environment." *KEDI Journal of Educational Policy*, 2013. pp. 112–113. Accessed via ProQuest. [2] Hinton, M. "Focus on Social-Emotional Learning Leads to Improved Attendance, Behavior." *Education Week*, September 22, 2016. http://blogs.edweek.org/edweek/time_and_learning/2016/09/focus_on_social-emotional_learning_leads_to_improved_attendance_behavior.html

students may be less likely to pick up on social cues or may struggle with emotion and behavior management.¹⁰⁶⁰ She argues that a SEL program can benefit special education students by:¹⁰⁶¹

- Building the social and emotional consciousness of non-disabled kids promotes a climate of inclusion and tolerance of different needs; and
- Help[ing] special needs kids develop their own social and emotional competence.

In practice, SEL programs for special education students may involve increased use of visuals and “repetition of core concepts.”¹⁰⁶² For example, “students who lack strong language development may learn hand gestures to express their feelings and learn to classify others’ facial expressions.”¹⁰⁶³ CASEL emphasizes that “SEL is not a standalone program, but rather, a set of principles and practices that support success across [a] district.”¹⁰⁶⁴ Teachers can offer SEL instruction at the classroom level (integrated into the curriculum and daily teaching), while districts and schools can integrate SEL principles more broadly into daily operations.¹⁰⁶⁵

Research indicates that SEL programs have positive effects on emotional, behavioral, and academic outcomes for students across grade levels. For example, a meta-analysis published in 2011 in *Child Development* of 213 school-based SEL programs encompassing 270,034 students in Kindergarten through high school finds that, compared to controls, SEL participants “demonstrated significantly improved social and emotional skills, attitudes, behavior, and academic performance that reflected an 11-percentile-point gain in achievement.”¹⁰⁶⁶ These findings mirror those of a subsequent meta-analysis published in 2017, which concludes that participants in SEL programs “fared significantly better than controls in social-emotional skills, attitudes, and indicators of well-being.”¹⁰⁶⁷ The authors note that SEL programs positively impacted social and emotional competencies, attitudes, positive social behavior, academic performance, conduct problems, emotional distress, and drug use.¹⁰⁶⁸

TEACHER-IMPLEMENTED STRATEGIES

Experts emphasize verbal reinforcement of positive behavior as a key strategy for teachers who support students with learning and behavioral difficulties. The National Association of Special Education Teachers (NASSET) suggests that verbal reinforcement of appropriate behavior is “perhaps the most important and effective [strategy]” to help students with learning disabilities (LD) learn how to behave appropriately.¹⁰⁶⁹ Accordingly, in a 2015 article published in *Creative Education*, Polirstok identifies a series of strategies for managing inclusive classrooms, many of which focus on the use of positive, rather than negative, behavior reinforcement, which appear in the following figure. Polirstok notes that, while these strategies are relatively easy to implement, consistency and “teacher fidelity to the behavioral expectations that have been established for students” is essential for their success.¹⁰⁷⁰

¹⁰⁶⁰ DeNisco, A. “Social-Emotional Learning Enhances Special Ed and Beyond.” *District Administration*, 2016.

<https://www.districtadministration.com/article/social-emotional-learning-enhances-special-ed-and-beyond>

¹⁰⁶¹ Bullets quoted verbatim from: Ibid.

¹⁰⁶² Ibid.

¹⁰⁶³ Ibid.

¹⁰⁶⁴ “Integration.” CASEL. <https://drc.casel.org/integration/>

¹⁰⁶⁵ [1] “Integration.” CASEL. <https://drc.casel.org/integration/> [2] Yoder, N. American Institutes for Research, 2014. p.7. <http://www.gtllcenter.org/sites/default/files/TeachingtheWholeChild.pdf>

¹⁰⁶⁶ Durlak, J. et al. “The Impact of Enhancing Students’ Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions.” *Child Development*, 82:1, 2011. p. 1. <https://www.casel.org/wp-content/uploads/2016/06/meta-analysis-child-development-1.pdf>

¹⁰⁶⁷ Taylor, R. et al. “Promoting Positive Youth Development Through School-Based Social and Emotional Learning Interventions: A Meta-Analysis of Follow-Up Effects.” *Child Development*, 2017. p. 1. <http://blogs.edweek.org/edweek/rulesforengagement/Taylor%20et%20al%20-%20FINAL%20document%206%2017%202017.pdf>

¹⁰⁶⁸ Ibid., p. 8.

¹⁰⁶⁹ “Effective Teaching Strategies for Students with LD.” National Association of Special Education Teachers. p. 10. http://www.cfn107.org/uploads/6/1/9/2/6192492/ld_effective_teach_strategies.pdf

¹⁰⁷⁰ Polirstok, S. “Classroom Management Strategies for Inclusive Classrooms.” *Creative Education*, 6, 2015. p. 932. https://file.scirp.org/pdf/CE_2015061911195415.pdf

Inclusive Classroom Management Strategies

| STRATEGY | DESCRIPTION |
|--|--|
| Creating a reinforcing classroom environment | <p>To develop a supportive classroom that reinforces positive behaviors, teachers should:</p> <ul style="list-style-type: none"> ▪ Maintain a high ratio of approvals to disapprovals. This refers to the number of times that teachers express their approval versus disapproval of a students' behavior. Research indicates that negative feedback (disapprovals) can reinforce negative behavior, rather than correct it. A higher ratio of approvals to disapprovals can create a cycle of "mutually pleasing interactions" where approvals continually reinforce good behavior continually and vice versa. |
| Using selective ignoring | <p>While positive feedback or approval reinforces appropriate behavior, negative feedback "does not teach the target behavior." To limit disapprovals, teachers should:</p> <ul style="list-style-type: none"> ▪ Ignore the inappropriate behavior in the moment. However, if a students' behavior is harming themselves or others, the teacher must address this behavior in the moment. ▪ Use positive feedback for other students who are behaving appropriately. "Approving students for engaging in the correct behavior reinforces expectations and gives the students who are engaging in the problematic behavior an opportunity to not only see the correct behavior, but to see their peers earning reinforcement for that behavior." |
| Focusing on structure and routine | <p>Teachers need place an emphasis on structure and routine to create a safe inclusive classroom environment. Teachers should:</p> <ul style="list-style-type: none"> ▪ Teach and reinforce routines and expectations throughout the year. ▪ Alert students with learning and behavioral challenges of changes in routine or schedule. For some students, this should occur several days in advance. Teachers should discuss expectations, appropriate behaviors, follow-up assignments, and potential rewards for good behavior. ▪ Give deliberate and clear instructions. Teachers should reinforce listening skills when giving instructions and can prompt students if an assignment requires multiple steps (e.g., ask, "what should be done first?...second?" etc.). ▪ Provide students with appropriate tasks. For independent work, teachers need be sure that tasks align with students' abilities. When work is not a good fit, students may engage in inappropriate behavior. In such situations, teachers need focus on not escalating students' behavior. |
| Increasing student locus of control | <p>Students with learning and behavioral disabilities often blame others and external factors for their own problematic behavior; this is referred to as an "external locus of control." To encourage students to take responsibility for their actions, teachers can follow these steps:</p> <ul style="list-style-type: none"> ▪ Begin by asking a student to explain the problem behavior and what happened. ▪ Have the student identify what classroom or school rule was violated in this incident. ▪ Explore other options for responding to the same situation the next time. ▪ Once these alternative behavioral choices are identified, then the question becomes: What's the best choice? What's the 2nd best choice? What's the worst choice? Why? |
| Limiting the use of punishment | <p>Students with attention deficit problems often respond weakly to rewards and punishments, prompting teachers to increase the severity of punishments. As punishments are often ineffective in teaching target behaviors, teachers should:</p> <ul style="list-style-type: none"> ▪ Use punishment sparingly. Teachers should rely on positive behavior reinforcement, rather than punishment. ▪ Avoid a "take away approach" to punishment. Rather than take away earned privileges, teachers should emphasize the inappropriate behaviors loses students the opportunity to earn privileges going forward. "This is more than a semantic difference; it represents a difference in philosophy that effective teachers embrace." |

Source: *Creative Education*¹⁰⁷¹

NASET recommends that teachers provide feedback immediately, define the appropriate behavior when giving praise, and vary the statements used to reinforce positive behavior. In a list of strategies to help

¹⁰⁷¹ Figure adapted and italicized text quoted verbatim from: Ibid., pp. 928–932.

students with LD control their behavior, NASET identifies many of the above approaches, along with several others. These strategies appear in the following figure.

Behavioral Management Strategies for Students with LD

- **Remove nuisance items.** Teachers often find that certain objects (such as rubber bands and toys) distract the attention of students with LD. The removal of nuisance items is generally most effective after the student has been given the choice of putting it away immediately and then fails to do so.
- **Provide calming manipulatives.** While some toys and other objects can be distracting for both the students with LD and peers in the classroom, some students with LD can benefit from having access to objects that can be manipulated quietly. Manipulatives may help students gain some needed sensory input while still attending to the lesson.
- **Allow for escape valve outlets.** Permitting students with LD to leave class for a moment, perhaps on an errand (such as returning a book to the library), can be an effective means of settling them down and allowing them to return to the room ready to concentrate.
- **Hold parent conferences.** Parents have a critical role in the education of students, and this axiom may be particularly true for those with LD. As such, parents must be included as partners in planning for the student's success. Partnering with parents entails including parental input in behavioral intervention strategies, maintaining frequent communication between parents and teachers, and collaborating in monitoring the student's progress.
- **Utilize peer mediation.** Members of a student's peer group can positively impact the behavior of students with LD. Many schools now have formalized peer mediation programs, in which students receive training in order to manage disputes involving their classmates.
- **Use behavioral prompts.** These prompts help remind students about expectations for their learning and behavior in the classroom.
- **Visual cues.** Establish simple, nonintrusive visual cues to remind the student to remain on task. For example, you can point at the student while looking him or her in the eye, or you can hold out your hand, palm down, near the student.
- **Proximity control.** When talking to a student, move to where the student is standing or sitting. Your physical proximity to the student will help them to focus and pay attention to what you are saying.
- **Hand gestures.** Use hand signals to communicate privately with a student with LD. For example, ask the student to raise his or her hand every time you ask a question. A closed fist can signal that the student knows the answer; an open palm can signal that he or she does not know the answer. You would call on the student to answer only when he or she makes a fist.

Source: National Association of Special Education Teachers¹⁰⁷²

DE-ESCALATION PRACTICES

When a conflict or crisis does occur, teachers should keep their voices low, give students personal space, and retain control. In this situation, teachers' responses can easily escalate the situation, possibly resulting in violent confrontations and the need for increased disciplinary action (e.g., suspensions). Training teachers in de-escalation techniques, as well as providing accessible staff members who can quickly cover a class for several minutes while the teacher works with the student outside the classroom, can mitigate situations that might otherwise result in more serious disciplinary action.¹⁰⁷³ The following figure lists a series of strategies for crisis de-escalation highlighted by Polirstok for use in inclusive classrooms.

De-Escalating a Behavioral Crisis

| STRATEGY | DESCRIPTION |
|-------------|--|
| Voice level | <ul style="list-style-type: none"> ▪ Teachers need to recognize that when the emotional temperature of the interaction is becoming heated, that they should drop their voice tone as one way of preventing a situation from escalating. |

¹⁰⁷² Bullets quoted verbatim from: "Effective Teaching Strategies for Students with LD," Op. cit., pp. 10–12.

¹⁰⁷³ Tucker, J. "In Bid to Reduce Suspensions, Schools Try de-Escalation and 'Pull-Ins.'" *San Francisco Chronicle*, August 19, 2016. <http://www.sfchronicle.com/education/article/In-bid-to-reduce-suspensions-schools-try-9174039.php>

| STRATEGY | DESCRIPTION |
|---|--|
| Student personal space | <ul style="list-style-type: none"> Teachers should be cognizant not to move into the student's personal space. Even if there is a reasonable space between the teacher and the student, the teacher should take a step back from the student so as not to be in range in case the student loses control and throws a punch. As the teacher moves out of the way, deliberately if possible, the teacher should lower hands to his/her side. This is a good visual cue to the student that they are not going to be physically threatened. |
| Repeated instructions | <ul style="list-style-type: none"> While keeping the teacher's voice tone at a modulated level, the teacher should keep asserting what the student should do. Teachers need to remember that when students are agitated, less teacher talk is preferred. Use calm, focused language that is short and clipped; the less verbose the better. For example, the teacher might keep repeating "return to your seat; find your seat; sit down now." As long as the voice level is not increasing, repetition of the direction simply maintains the teacher's request without escalating the situation. Repeating a "what to do" with greater specificity can be used effectively in a crisis situation. |
| Reinforcement of behavior/ consequences | <ul style="list-style-type: none"> If the confrontation seems to have passed, then the teacher needs to give the student an opportunity to find the way back to his/her seat without "losing face." As soon as the student complies, the teacher needs to provide positive reinforcement for making a "good behavioral choice." Should the student not return to his/her seat, the teacher should remind the student that (s) he is not making a good choice and that the teacher will need to follow up with the student later. |

Source: *Creative Education*¹⁰⁷⁴

Effective de-escalation practices can reduce the use of restraint and seclusion of students with disabilities.¹⁰⁷⁵ During the de-escalation discussion, teachers should focus on calming the student by refusing to engage in an argument. [The National Center on Safe Supportive Learning Environments](#) recommends that teachers respond selectively during the outbreak, answering only informational questions. Instead of asking how a student is feeling, teachers should ask for an explanation of what the student is saying. Teachers can suggest alternatives as appropriate (e.g., "would you like to take a break from this assignment now and work on your project instead"), as well as ask whether a student would like to discuss the issue calmly now or later in private. Teachers should present consequences for inappropriate behavior "without threats or anger" and "represent external controls as institutional rather than personal."¹⁰⁷⁶

¹⁰⁷⁴ Figure text quoted verbatim from: Polirstok, Op. cit., pp. 930–931.

¹⁰⁷⁵ Dunlap, G., C. Ostry, and L. Fox. "Preventing the Use of Restraint and Seclusion with Young Children: The Role of Effective, Positive Practices." Technical Assistance Center on Social Emotional Intervention, 2011. p. 5.
<https://files.eric.ed.gov/fulltext/ED526387.pdf>

¹⁰⁷⁶ "De-escalation techniques." Safe and Supportive Schools.
https://safesupportivelearning.ed.gov/sites/default/files/sssta/20110707_DeescalationTechniques.pdf

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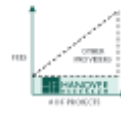
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