

## Technology, Invention and Innovation Week 2

**Overview:** For decades, technology has helped to improve the lives of people with disabilities and injuries. Using **PBS NewsHour** resources, you will learn about the invention process, including a bio-medical device which allows individuals who cannot physically speak to type sentences by simply thinking. You will then research a medical invention or procedure and create innovative ways to improve upon it.

### **Essential Questions:**

How do inventions change the lives of people? Are the changes always positive? Explain.

### **Objectives**

- To improve upon the design of a common medical product or procedure using the design or invention process.
- To understand the steps of the invention process and how innovation can be used for social change.

**Key Vocabulary:** Technology, Invention, Innovation

**Background:** Medical procedures or devices are used to prevent, relieve, treat or cure the symptoms of human suffering caused by a disease or an accident. Such medical inventions have existed for thousands of years and are undergoing constant improvement or innovation. In this lesson, students will research how medicine has changed over the course of history through improvements in design.

**Content Alignment:** Aligns with the Ohio Department of Education Learning Standard for Science. Specially the Nature of Science:

- **Scientific Inquiry, Practice and Applications** - All students must use scientific processes with appropriate laboratory safety techniques to construct knowledge and understanding in all science content areas.
- **Science is a Way of Knowing** -Science assumes the universe is a vast single system in which basic laws are consistent. Natural laws operate today as they did in the past and they will continue to do so in the future. Science is both a body of knowledge that represents a current understanding of natural systems and the processes used to refine, elaborate, revise and extend this knowledge.
- **Science is a Human Endeavor** -Science has been, and continues to be, advanced by individuals of various races, genders, ethnicities, languages, abilities, family backgrounds and incomes.
- **Scientific Knowledge is Open to Revision considering New Evidence** -Science is not static. Science is constantly changing as we acquire more knowledge.

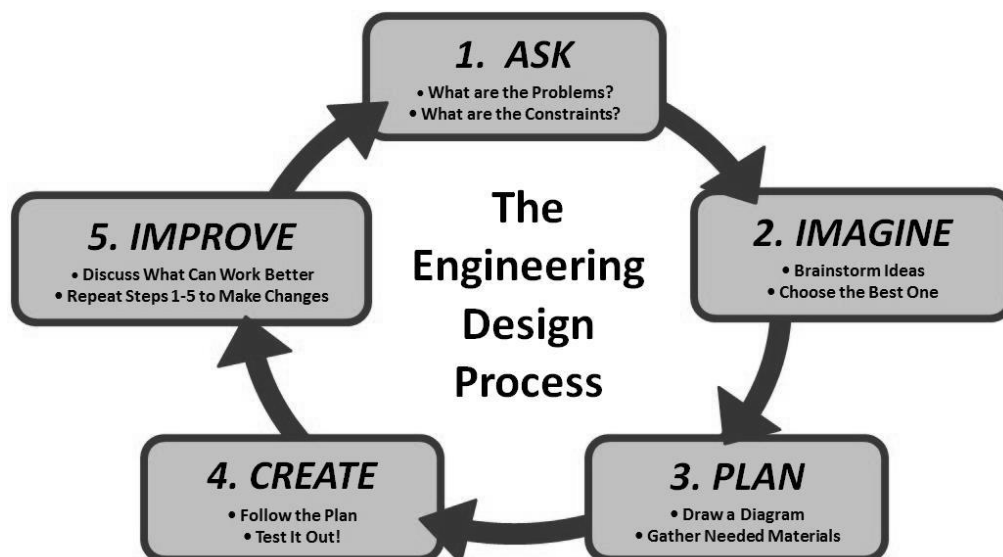
**Cognitive Demand: Expectation for Learning:** Designing Technological/Engineering Solutions Using Science Concepts requires students to solve science-based engineering or technological problems through application of scientific inquiry. Within given scientific constraints, propose or critique solutions, analyze and interpret technological and engineering problems, use science principles to anticipate effects of technological or engineering design, find solutions using science and engineering or technology, consider consequences and alternatives and/or integrate and synthesize scientific information.

## Procedure

### Week 2 Days 1-3

#### Part Three – Sketch, model or build a prototype

1. Innovate your medical invention from part two or design a new medical invention.
2. Sketch, model or build a prototype using any materials you may have. Include explanatory boxes or bubbles around the diagram, or if you have built a model or prototype, create a one-page document with the following requirements:
  - What is the problem your invention/innovation addressing? How does your invention/innovation help people?
  - How is your device better than the existing product?
  - List at least THREE problems you came across with your innovations and how you solved them.
  - What are some additional comparisons you can make between your invention and what is already on the market?
  - How does this activity demonstrate how the invention process works? Could you skip a step and still come up with a usable product?
  - Address the impacts on the human body and the environment based on your new design. How does your invention interact with or affect the environment? How about with a person's physical well-being? If a product may be helpful but may harm other parts of the body or the ecosystem, you may have to think about whether the product is innovative.
  - Next, address the economic implications of your invention. Think of the automobile or the computer and the millions of jobs associated with these two inventions. How could the improvements made to your invention help create more jobs? Do you have a rough estimate of how many new jobs may be created? Is there a chance that your new design will eliminate people's jobs? Explain.



## Week 2 Days 4-5

### **Part Four- Presentation- Think Shark Tank**

1. Create an investors pitch. A pitch is a short presentation, no more than 7 minutes or it can be an informational document- print or digital.
2. Include the following information:
  - Title- What is the name of your product?
  - Company Name- Be creative
  - Slogan-Describe your invention idea in five words or less
  - Category- Is it a diagnostic tool, prosthetic, aide/support, etc.?
  - Soft Sell-Detailed description: Tell us about your invention. What are the features and benefits? What problem does it solve? (500 words or less) This can be a recorded oral presentation or a written document.
  - Hard Sell-What is innovative about your invention? What is “new” about your invention? (100 words or less) This can be a recorded oral presentation or a written document.
  - Competitors- Do your research. Identify three potential competing products or technologies that address similar issues. Explain why yours is superior.
  - Audience: Who will want or needs your product?
    - Branding- your brand is your promise to your customer. It tells them what they can expect from your products and services
    - Packaging-Logo
    - Marketing-How will you sell your product?
  - Include one or more the following:
    - Technical drawing
    - Prototype
    - Demonstration video