



Invention and Innovation

At-A-Glance

Intended Audience: Grade 7

Course Length: 18 weeks

Students learn all about invention and innovation. They study the history of inventions and innovations, including their impacts on society. They learn about the core concepts of technology and about the various approaches to solving problems, including engineering design and experimentation. Students apply their creativity in the invention and innovation of new products, processes, or systems. Finally, students learn about how various inventions and innovations impact their lives.

Invention, Innovation, and the Design Process: Invention and Innovation are created using the Engineering Design Process.

- **Inventing 101:** Introduce students to the history of invention and innovation. Students will gain a basic vocabulary to use through the curriculum and a basic understanding of invention and innovation.
- **Engineering Design Process:** Learn that using the Engineering Design Process as a systematic problem-solving strategy results in the best possible solution to a technological problem.
- **Innovation in Action:** Combine the knowledge gained in Lessons One and Two to innovate a board game to make it both educational and entertaining.

Core Concepts: Invention and innovation are driven by human needs and wants and are influenced by the core concepts of technology: systems, resources, requirements, optimization, trade-offs, processes, and controls

- **Systems:** Introduce students to the core concepts of technology and how they are used to invent, innovate, or evaluate technology products or systems.
- **Reverse Engineering:** Give students an in-depth look at how a product works while looking for ways to innovate and improve the product.
- **Mechanisms:** Reinforce the use of mechanisms in everyday objects. Introduction to mechanical subsystems and types of motion. Students will take their knowledge of mechanical subsystems to innovate a greeting card.

Technological Impacts: Create awareness and understanding that while technology has allowed humans to prosper, negative impacts have also resulted.

- **Reducing, Reusing, and Recycling:** Introduce students to the concept of technological impacts.
- **Cleaning Up the Mess:** Learn that decisions about the use of technology can put environmental, economic, political, and societal concerns in conflict with each other
- **Creating Alternative Solutions:** Familiarize students with the importance of tracking technological impacts on the environment.

Getting Creative: Engage students in the engineering design process while teaching them to sketch, draw, and design.

- **Drawing and Designing:** introduce students to the different types of drawing. Sketching is a major component to the Engineering Design Process and students should understand how to choose and use appropriate drawing types.
- **Creating a Scale:** Teach students how to create accurate scale drawings. Students will reflect on their drawings from the preliminary challenge and recreate the drawing using an appropriate scale.
- **Digital Drawing:** Introduce students to Computer-Aided Drafting (CAD) also known as digital drawing. In Lessons One and Two, students focused on learning technical drafting skills. In this lesson, students will use the knowledge previously acquired to make CAD drawings of a previous created piece.



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For More Information

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