MP4- Motion/Technology and Design

Content Area: **Science**
Course(s): **Science 4**
Time Period: **Marking Period 4**
Length: **MP4**
Status: **Published**

Essential Questions

- How does technology affect your life?
- How can technology be used to solve problems?
- How can patterns encode, send, receive, and decode information?
- What are the steps in the design process, and how are they used?

Big Ideas

- Technology is the knowledge, processes, and products that solve problems and make work easier.
- Technology can be used to solve problems.
- Patterns can encode, send, receive and decode information.
- The design process is a set of steps for developing products and processes that solve problems.

Science and Engineering Practices

Constructing Explanations and Designing Solutions:

- Apply scientific ideas to solve design problems.
- Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

Science and Society

Nicolaus Copernicus

Astronomer who studied the works of Ptolemy and other astronomers – developed a different theory of how to model the universe

CSDT Technology Integration

8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Activity: Students will use Legends of Learning to participate in an online interactive design challenge. Once completed, students will have conversations with a partner discussing the success and challenges of the activity.

Enduring Understandings

Optimizing the Design Solution

4-PS4.C Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

Defining and Delimiting Engineering Problems

4-ETS1.A Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.

Designing Solutions to Engineering Problems

4-ETS1.B Testing a solution involves investigating how well it performs under a range of likely conditions.

Information Technologies and Instrumentation

4-PS4.C Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa.

Focus Areas

Knowledge

- Technology solves problems and makes life easier.
- Different solutions need to be tested to see which best solves a given problem.

- Possible solutions to a problem are limited by available materials and resources.
- Digitized information can be transmitted over long distances (computers, cell phones, GPS).

Skills

- Analyze ways in which technology can be used to solve problems.
- Communicate and use the steps in the design process.
- Research and design ways to load cargo onto a cart.
- Decode a set of digitized information.

Understanding

- Generate and compare multiple solutions that use patterns to transfer information.
- Apply the steps in the design process to design, test, and refine a vehicle that will carry cargo best.

Resources

Primary Resource

Pearson Interactive Science, 2016

- Skills Handbook Part 2: Technology and Design

Secondary Resources

Pearson Leveled Readers

- *Technologyand Design*
- *Technology and Design at Work*
- *Using Nature for Design*

Scientific Inquiry

Core

- Design Challenge