MP2b-Energy and Natural Resources

Content Area: **Science**
Course(s): **Science 4**
Time Period: **Marking Period 2**
Length: **MP2**
Status: **Published**

Essential Questions

- What is renewable energy and what is nonrenewable energy?
- What is the difference between nonrenewable and renewable energy?
- How does human energy impact the environment?

Big Ideas

- Energy and fuels humans use are derived from natural sources and their use affects the environment.
- Some resources are renewable over time, others are not.
- Plants capture energy from sunlight, which can later be used as fuel or food.

STEM/STEAM

FOSTER DESIGN THINKING: Discuss ways that Milltown gets power/energy and problems that arise related to that energy source. Develop ways that Milltown could work to solve that problem

Enduring Understandings

Natural Resources

4-ESS3.A Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.

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.

Focus Areas

Knowledge

- Humans use energy and fuels derived from natural sources.
- Devices must be designed, tested, and refined in order to convert energy.
- Renewable energy is energy that comes from a source that replenishes quickly and will not be used up before more is created.
- Non-renewable energy is energy that comes from a source that is very slow to replenish and can be used up.
- Human energy use has many impacts on the environment.

Skills

- Build a device that converts energy from one form to another by following instructions.
- Design and build a simple device that converts energy from one form to another.
- Define a simple engineering problem related to constraints due to materials, cost, or time.
- Explain one energy type in depth, including where the energy is found, what it is used for, and how it impacts the environment.
- Analyze a combination of information they have collected about one type of energy.

Understanding

- Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

CSDT Technology Integration

8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

Activity:

Students will complete an organizer where they use the Internet to research one ecosystem to find where it's located, the climate, plants, and animals there. Students will work in groups to use their organizer to create a Google slide show about their ecosystem. (Multiple students will have the same ecosystem, and they can compare notes.) Students will present their slide shows to the class.

Climate Change

3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time or cost.

- Activity: Create a butterfly garden that attracts butterflies to your schoolyard. Students will research and select butterfly-attracting plants.

Then, plan the layout of the garden, considering the growth habits of the plants and creating a welcoming environment for butterflies. Students will plant the selected plants in the garden area; water and care for them regularly, observing their growth. Students will observe the garden regularly to see if butterflies visit. Document the types of butterflies seen and their behavior.

4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

- Activity: Students will work in groups to research a specific energy source (e.g., coal, solar, hydroelectricity). Instruct students to research the following: How is this energy source obtained from natural resources? What are the environmental impacts of obtaining this energy source (e.g., mining, drilling, land use)? How does the use of this energy source affect the environment (e.g., air pollution, water pollution, greenhouse gas emissions)?

Resources

Primary Resource

Pearson Interactive Science, 2016

- Chapter 5: Ecosystems

Secondary Resources

Pearson Leveled Readers

- *Ecosystems*
- *Ecosystem Life*
- *Life in a Pond*

Scientific Inquiry

Core

- Collecting the Sun’s Energy