

**Augusta Canal National Heritage Area  
Fourth Grade Canal Sciences Program Outline**

**Standards:**

**GA:**

**S4CS4.** Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

a. Observe and describe how parts influence one another in things with many parts. b. Use geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories to represent corresponding features of objects, events, and processes in the real world. Identify ways in which the representations do not match their original counterparts.

**S4P3.** Students will demonstrate the relationship between the application of a force and the resulting change in position and motion of an object.

a. Identify simple machines and explain their uses.(lever, pulley, wedge, inclined plane, screw, wheel & axle)

d. demonstrate the effect of gravitational force on the motion of an object.

**S4L1.** Students will describe the roles of organisms and the flow of energy within an ecosystem. a. Identify the roles of producers, consumers, and decomposers in a community. b. Demonstrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers. c. Predict how changes in the environment would affect a community (ecosystem) of organisms. d. Predict effects on a population if some of the plants or animals in the community are scarce or if there are too many.

**S4L2.** Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation), and external features (camouflage and protection). a. Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (for example: camouflage, use of hibernation, protection, etc.). b. Identify factors that may have led to the extinction of some organisms.

**SC:**

4-2.1 Classify organisms into major groups (including plants or animals, flowering or non-flowering plants, and vertebrates [fish, amphibians, reptiles, birds, and mammals] or invertebrates) according to their physical characteristics. 4-2.2 Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.

4-2.5 Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment).

4-2.6 Explain how organisms cause changes in their environment.

4-5 The student will demonstrate an understanding of the properties of light and electricity.

**Essential Question(s):**

1. What is an ecosystem and how are they important?
2. What are producers, consumers, and decomposers and how do they contribute to the environment?
3. How were the original machines at Enterprise Mill powered?
4. How are machines at enterprise Mill powered today?

**Objectives:**

Students will be able to explain the dynamics of an ecosystem and how they are important.

SWBAT develop an understanding of the contributions of producers, consumers, and decomposers.

SWBAT determine the concept of extinction and what causes it or helps animals avoid it.

Students will understand how the gravitational flow of water powers simple machines and electric generators..

Students will understand how energy changes from potential energy, to kinetic, to mechanical, to electric energy and electricity..

**Plan for Field Trip:**

1. Students will take a 45 minutes eco-boat tour through canal aquatic and woodland habits, seeing first hand a ecosystem rich in flora and fauna. They will learn the adaptations and physical features of animals needed to survive in their environment.

Students will discuss the harmful effects of pollution, the necessity of conservation and recycling, as well as

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important physical and behavioral adaptations of plants and animals in response to humans, other animals, changes in their habitats, etc. in an ecosystem. They will learn about extinction and the factors leading to it.

2. Students will take a walking tour of our hydro-electric power plant, following the water from the canal through the turbines and back to the river. Students get a first hand view of how hydro electricity is generated.

3. Students will participate in an interactive power point presentation on how water power runs simple machines and makes electricity at Enterprise Mill.

4. Students will explore how to use a pulley and use a pulley in a race.

5. Students will watch how the gravitational flow of water works for man using a working model of a canal lock and a working model of a turbine.

**Materials:**

Power Point Presentation

10 pulley systems, string, 10 miniature bales of cotton

Canal and turbine working models

“What do you see?” Power Point

Vocabulary on-line lists

**Timeline:** 9:45 am-12:15

Eco-Boat Ride 45 minutes

Hydro Power Walk/Tour: 15 minutes

Cotton Room Classroom Hydro Power/Simple Machines Power Point 10 minutes

Pulley Race

Hydro Powered Turbine Demonstration and Lock Demonstration. 10 minutes

**Pre-visit Activities**

Hydro Power Vocabulary

Environmental Vocabulary

What do you see? Writing anticipation and assessment activities

**Assessment:**

. Ongoing assessment will take place throughout the course of the field trip with questions and activities.

Post visit classroom discussion and “What do you see?” activity.