

**Augusta Canal National Heritage Area
Grades 9-12 Physical Science & Physics Lesson Plans**

Standards:

GA:

SPS1. Students will investigate our current understanding of an atom. a. examine the structure of an atom in terms of proton, electron and neutron locations.

SPS8 Students will determine relationships between force, mass, and motion. b. Apply Newton's 3 laws to everyday situations by explaining the following: Inertia, relationship between force, mass and acceleration, and equal and opposite forces. c. Relate falling objects to gravitational force d. Explain the difference in mass and weight

SPS10 Students will investigate the properties of electricity and magnetism. C. Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to electromagnets.

SP1 Students will analyze the relationships between force, mass, gravity, and the motion of objects.

SP3 Students will evaluate the forms and transformations of energy.

SP5 Students will evaluate relationships between electrical and magnetic forces. a. Describe the transformation of mechanical energy into electrical energy and the transmission of electrical energy. d. Determine the relationship between moving electrical charges and magnetic fields.

SC:

PS-2 Students will demonstrate an understanding of the structure and properties of atoms.

PS-5. The student will demonstrate an understanding of the nature of force and motion. 1-10

PS-6. The student will demonstrate an understanding of the nature of conservation and transformation of energy.

PS-6.1, 2, 3 & 11

P-3. The student will demonstrate an understanding of the conservation, transfer, and transformation of mechanical energy. 2. Apply the law of conservation of energy to the transfer of mechanical energy through work.

P-4. The student will demonstrate an understanding of the properties of electricity and magnetism and the relationships between them.

Essential Question(s):

1. Do materials that make good conductor share electrons?
2. What scientific laws of force and motion are at work in Enterprise Mill?
3. How does a hydro electric generator work?
4. What is the role of gravity in a hydro electric power plant.

Objectives:

Students will be able to calculate the kW capacity of a generator in Enterprise Mill.

Students will see conservation of energy at work in order to produce electricity.

Students will follow and understand the hydro electric process.

Plan for Field Trip:

1. Students will listen to orientation and outline for the day in courtyard.
2. Students will participate in a boat tour highlighting the use of water power for economic growth.
3. Student will take a hydro power walk following the water from the canal through the hydro electric plant and watch a working model of a water turbine.
4. Student will participate in a power point presentation covering the scientific laws behind hydro power.

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Timeline:

9:45-10:00	Courtyard Orientation
10:00-10:45	Hydro-Boat Ride
10:45-11:00	Hydro Power Walk Through Plant & demonstration
11:00-11:45	Classroom ppt ,

Materials:

Water
Demonstration models
Computer & ppt

Assessment:

Assessment writing "What do you see?" activity.
Coal vs Hydro- power word problem.