Synopsis: Human Powered Flashlight Challenge

In this activity we will build a human powered flashlight. This should reinforce what we have learned about circuits and give us an opportunity to explore how an electric generator works.

Standards

4th Grade

1d. Students know the role of electromagnets in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones.

1g. Students know electrical energy can be converted to heat, light, and motion.

9-12th Grade

5f. *Students know* magnetic materials and electric currents (moving electric charges) are sources of magnetic fields and are subject to forces arising from the magnetic fields of other sources.

Driving Questions

1. How can you utilize electric energy?
2. How can you generate electric energy?

Learning Objectives

1.) Students will gain a hand on understanding of how mechanical motion is used to generate electricity.

Human Powered Flashlight Challenge

Procedure

Work independently.

Make sure you have the following:

- Hand crank generator
- Long alligator jumpers
- 1 D Battery
- 1 light bulb holder
- 1 small light bulb

Your goal: Remake the flashlight (from DC Circuits and the Flashlight Challenge) using human power.

Follow up questions:

1. Why does the bulb light up?
2. Does the speed at which you crank the generator affect the light output?
3. How do you think the hand crank generator works? Sketch a model if you can.

Instructor Notes: Human Powered Flashlight

This activity is relatively bullet proof. For completion, it is important to move from this to a model of how an electric generator works ("Virtual Devices"… stay tuned).

Safety
This activity has little to no risk associated with it.

Materials

- Hand crank generator
- Long alligator jumpers
- 1 D Battery
- 1 light bulb holder
- 1 small light bulb

Notes