

Robot Hacklab Post Activity	Grades 4-5
------------------------------------	-------------------

Electrical Shuffle

Assessment	
Cross-curricular	

Big Ideas

Energy can neither be created nor destroyed, only transformed. (Grade 5)

Light and sound are forms of energy with specific properties. (Grade 4)

Specific Expectations

1. Identify a variety of forms of energy and give examples from everyday life of how that energy is used. (Grade 5- 3.1)
2. Describe how energy is stored and transformed in a given device or system (Grade 5 – 3.3)
3. Explain that energy apparently “lost from a system has been transformed into other energy forms. (Grade 5 - 3.5)
4. Identify a variety of natural light sources and artificial sources. (Grade 4 – 3.1)
5. Distinguish between object that emit their own light, and those that reflect light from other sources (Grade 4 – 3.2)

Description

Students use balloons and their hair to generate static electricity, and then transform that electrical energy into light.

Materials

- Package of balloons with enough for the entire class to have one.
- One fluorescent light bulb

Safety Notes

While allowing students to “zap” the light bulb, take care to make sure the bulb is not dropped.
 (Avoid mercury release into the air by cleaning broken pieces into a sealed bag)

Introduction

1. Remind students of the ways we used and produced light in the “Robot Hack Lab”
2. Remind students of how the lighthouses they created during the “Robot Hack Lab” were changing chemical energy into light energy.
3. Ask students to identify other things that produce light, and identify artificial versus artificial, and whether it is produced or reflected. (Sun vs. Moon)
4. Have students draw a number of other ways in which energy is changed from one type to another (Light into chemical energy in plants, Chemical energy into kinetic energy in explosions, kinetic energy into electrical energy in wind turbines etc.)
5. Explain that energy is not created, or destroyed, but only changed from one form into another.

Action

1. Have each student rub the balloon on their heads to generate an electrical charge on the rubber, changing kinetic energy to electrical energy.
2. Have students observe how balloons push each other away, changing electrical energy back to kinetic energy.
3. Have each student touch their just-charged balloon to the fluorescent light bulb in a darkened room, showing the conversion of electrical to light energy.

Consolidation/Extension

1. Have a discussion about how the different types of energy are used in your everyday life.
2. Discuss how the Cubelets the students used during the outreach activity, demonstrated energy changing from one form to another (chemical energy of battery is changed into electrical energy to power the Cubelet).

Key Terms

1. Natural: Existing in, or caused by nature.
2. Artificial: Made or produced by human beings rather than occurring naturally.
3. Electrical Energy: Relating to pushing and pulling of electrical charges
4. Kinetic Energy: Energy that an object has due to its motion.

5. **Chemical Energy:** Energy stored in the bonds of chemicals, which is released by reaction.