Lake Erie Nature & Science Center

LIGHT, HEAT AND ELECTRICITY

Grade 4 | 60 Minutes

Teacher's Guide

Description

In this inquiry-based field trip, students experiment with heat, light and electricity to explore energy transformation. Learn about circuits and what acts as a conductor of heat and electricity. Build your own circuits, experiment with heat and ice, and see how light makes things move. Demonstrations included.

Adult chaperones recommended: 4-6

Content Standards

Subject	Gr	Standard	Objective/"I can" Statements
Physical Science	4	• Energy transfers from hot objects to cold objects as heat, resulting in a temperature change. • Electric circuits require a complete loop of conducting materials through which an electrical energy can be transferred. • Electrical energy in circuits can be transformed to other forms of energy, including light, heat, sound and motion. • Electricity and magnetism are closely related.	• I can identify materials that are conductors of heat and electricity • I can identify materials that are insulators of heat and electricity • I can discuss and define parts of a circuit • I can explain the purpose of a switch in a circuit

Pre-Trip Activities

Measure the temperature of water. Recognize that an increase in temperature indicates an increase in heat energy and a decrease in temperature indicates a decrease in heat energy.

Vocabulary

insulator	light
conductor	heat
circuit	electricity

Book

Can You Feel the Force? By Richard Hammond. DK Publishing, 2006.

Post-Trip Activities at School

- Have students draw a circuit map of the lights in their classroom.
- Discuss how energy converts to heat, causing the warming of devices such as phones and computers.

Extension Activities

- Use Bare Conductive paint to have students draw their own working circuits on paper.
- Discuss the importance of roof color and road color as acting as an insulator or conductor.
- Electrical Conductors, an interactive simulation from BBC Schools, allows students to explore different materials and classify them as electrical conductors or insulators.
- It also emphasizes that a complete loop of conductors is needed for a circuit to be complete. The optional sections that deal with adding bulbs and batteries are not aligned with this content statement.
- Identify different types of energy conversions within an electrical circuit.
- Use ESFI.org to teach about electrical safety
    - http://files.esfi.org/file/ESFI-Electricty-Printouts.pdf

Other Resources:

http://files.esfi.org/file/ESFI-Electricty-Printouts.pdf