

# Electrical Energy

## Curriculum Unit

### Electrical Energy Curriculum Unit Overview

Elementary students will be familiar with the term *electricity*. Electricity is what makes the light bulb glow and the television operate. And students will be familiar with the electricity that comes from a battery to animate toys or allow cell phones to work.

As with other forms of energy, electrical energy is not visible but there are indicators of its presence, such as a spinning fan blade or the warmth from a toaster. In this unit, motion is the only indicator that students experience.

Note: Elementary students and even most adults will have only the most general ideas—and many misconceptions—about exactly what electricity or electrical energy is or the details of how electricity “works.” The general ideas are all that is necessary in order for students to extend their investigation of energy to electrical energy.

#### In the Classroom

The four investigations in the Electrical Energy sequence reinforce general energy concepts such as energy transfer and energy transformation as well as introduce new concepts specific to electrical energy. There is also an increased emphasis on communicating the “energy story” to others using a combination of annotated drawings or representations and text.

In the first investigation students use hand crank generators to transform motion energy into electrical energy. That electrical energy flows through wires and into a motor, where it is transformed back to motion energy to spin a propeller. In the second investigation, students use capacitors to store the electrical energy from a hand crank generator and later use that stored energy to power a motor that spins a propeller. In the third investigation students use solar cells that transform light (electromagnetic) energy into electrical energy. The purpose of the fourth session to help students consolidate their understandings of the electrical energy stories by creating posters that inform others about the flow of energy from the Sun through the solar cell and capacitor and on to the motor, where it is transformed into motion energy.

Throughout the four investigations students use the Energy Tracking Lens introduced in the Motion Energy unit as they identify the components of the system they are investigating and create annotated representations that illustrate the flow of energy through the system, note instances of energy transformation, and account for energy gains and losses.

