CONCEPT 2

Many different types of energy can be transformed into electrical energy.

Activity

Electrical Energy Detective

Where does the electrical energy used in your community come from? Discuss your ideas as a class. If you are not sure, how can you find out?

Energy is neither created nor destroyed. Instead, it is transformed from one kind of energy into another kind of energy. The electrical energy that runs your phone, hair dryer, and other electrical devices was transformed from another type of energy. Several types of energy are reviewed in **Figure 3.2**. Each can be transformed into electrical energy.

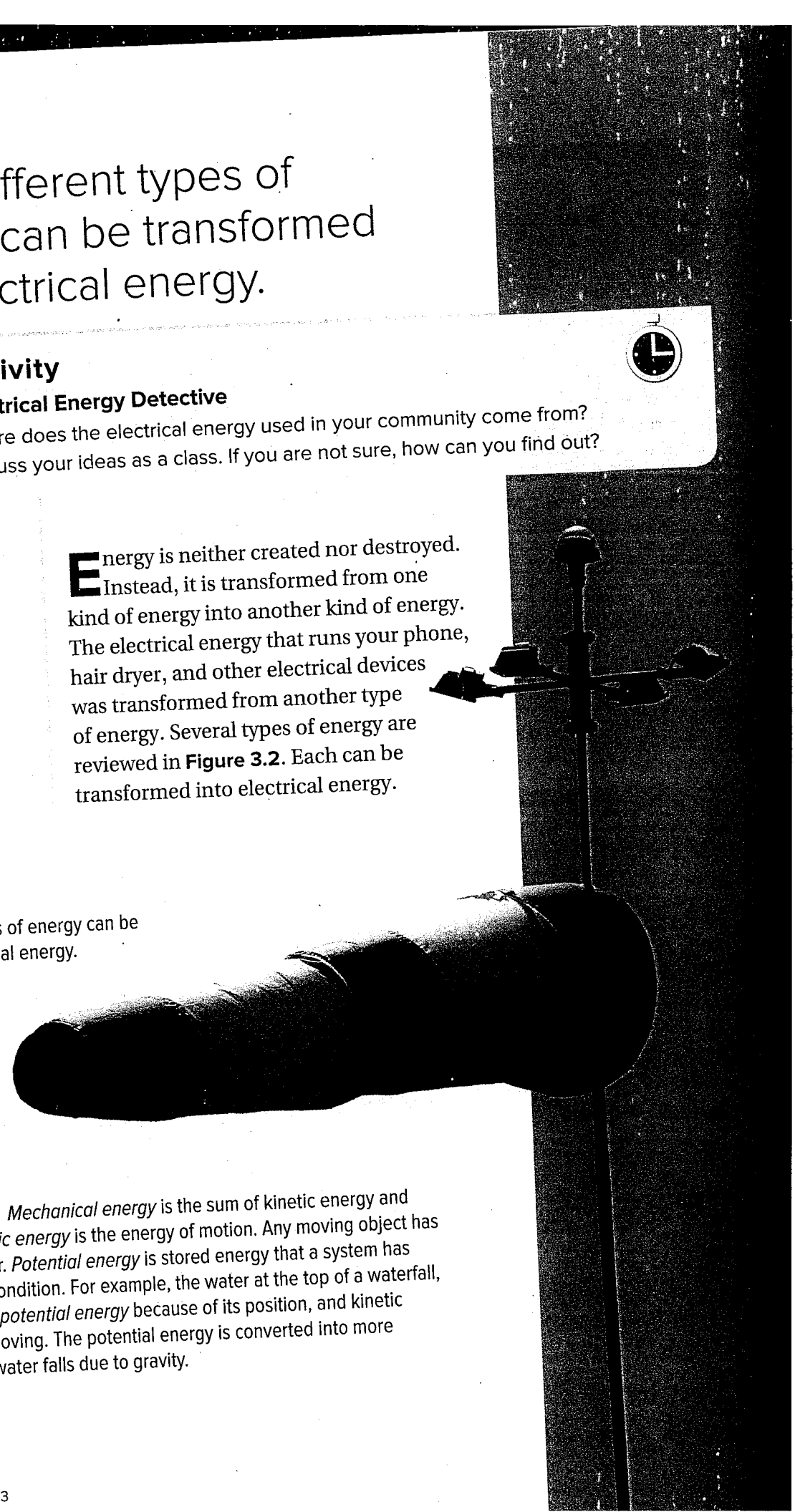
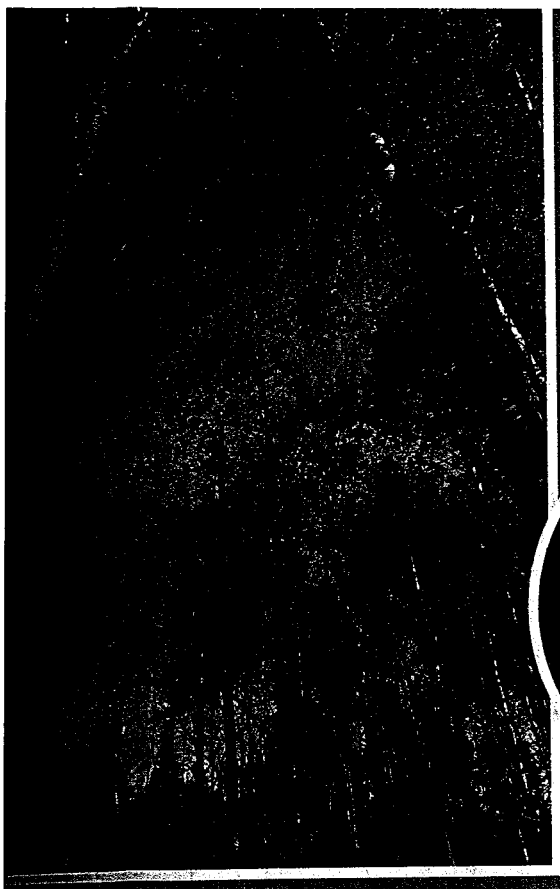


Figure 3.2 Many types of energy can be transformed into electrical energy.

Mechanical Energy *Mechanical energy* is the sum of kinetic energy and potential energy. *Kinetic energy* is the energy of motion. Any moving object has kinetic energy, even air. *Potential energy* is stored energy that a system has due to its position or condition. For example, the water at the top of a waterfall, just before it falls, has *potential energy* because of its position, and kinetic energy because it is moving. The potential energy is converted into more kinetic energy as the water falls due to gravity.



Chemical Energy

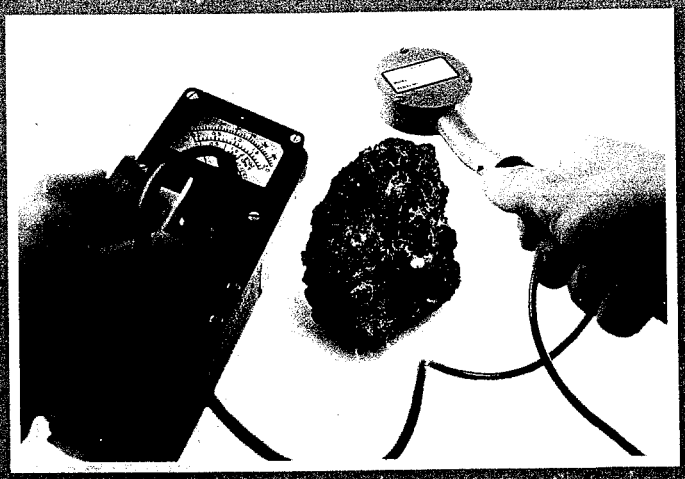
Chemical energy is stored in chemical bonds. It is released when a chemical reaction occurs. Batteries store chemical energy. Chemical energy stored in animals and in plants, such as these trees near Bowron Lake Provincial Park, is called biomass. Fossil fuels (coal, oil, natural gas) also store chemical energy.

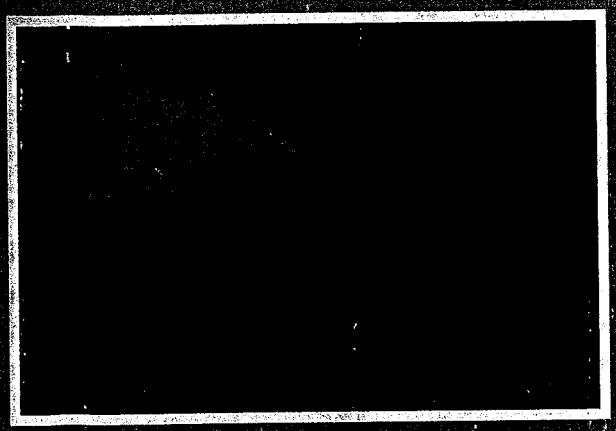
Solar Energy

Solar energy is energy carried by electromagnetic radiation given off by the Sun. Fossil fuels and biomass are the result of energy from the Sun being captured by plants and plant-like organisms.

Nuclear Energy

Nuclear energy is generated by forming new atoms. In *nuclear fusion*, new atoms are made as smaller atoms collide and fuse. Fusion reactions occur in the Sun and other stars. In *nuclear fission*, new atoms are made by splitting larger atoms. Fission reactions are carried out in reactors on Earth.





Thermal Energy

Thermal energy is the energy due to the rapid motion of particles that make up an object. We detect it as heat. It can come from many sources, such as nuclear reactions or from Earth's interior (geothermal energy), where steam and hot water form naturally. These are seen in geysers, volcanoes, and hot springs, like those at Liard River Hot Springs Provincial Park shown here.

Before you leave this page . . .

1. Explain the difference between kinetic energy and potential energy.
2. Describe the relationship among solar energy, biomass, and fossil fuels.