



Welcome to “Get a Charge out of Chemistry”!

Did you know the world’s first-ever battery was made over 2,000 years ago? Today, batteries are everywhere!

A battery is a storage device for energy. It contains chemicals that allow it to store energy in the form of **chemical energy**. This stored energy can be converted to electrical energy whenever we need it (on page 4, read about how a battery works). With this electrical energy, you can power anything ... from a flashlight to a car!

The HUGE role of batteries

Alternative energy sources (like solar and wind energy) are becoming more popular, as less and less oil is available for use. Fuels like oil and coal are called **fossil fuels**. Their use pollutes the earth. *Alternative* fuel sources, however, do not pollute the earth as much. They can replace fossil fuels, with the help of batteries (more about the role of batteries on page 3).

What types of batteries do you know about?

Certain batteries can be charged and reused (discharged) many times over. These are called **rechargeable batteries**. Common examples are cell phone and laptop batteries. However, other types of batteries have to be replaced with a new one once they “die.” They are called **single-use batteries** or **disposable batteries**. Old batteries of any type should be recycled (read more on page 8).

Other types of batteries include lead-acid batteries in gasoline powered cars; alkaline batteries in remote controls, flashlights, and smoke detectors; lithium or lithium-ion batteries in cellphones, hearing aids, electric vehicles (EVs), wheelchairs, etc.

About the cover:

The picture on the cover shows at least 11 gadgets that run on batteries. Can you find them all? Read on to confirm. (See page 9 for an activity to find items that function on batteries around your home.)

In the background, you will see a:

- Battery-operated pedestal fan (moles on a picnic);
- Radio (being set up on the blanket);
- Lantern (handheld);
- Battery-powered EV (which is plugged in for charging); and
- Mobile phone (being held by the mole charging the EV)

In the foreground, on the hiking path for pedestrians and battery-operated vehicles, you will see:

- Tera on her battery-operated wheelchair enjoying the warm day;
- Avi riding his safe Segway ride and soaking up the sun;
- Milli riding her e-scooter with the wind in her hair;
- A mole on his hoverboard having a ball;
- Other moles pedaling their e-bikes and appreciating the easy ride; and
- A mole runner with a smart watch, checking the number of steps as they workout.

You might also notice:

- Wind-powered turbines to harness wind energy; and
- Solar panels to harvest sun’s energy.

Batteries today are vital to our lives. But they also pose many challenges. Scientists are making batteries lighter and better, and also building batteries that pollute less with high-energy storage capacity. Obtaining the raw materials to make batteries is expensive and polluting (read more on page 11). Scientists are making many such improvements that can help refine the batteries of tomorrow.

Batteries are everywhere and they make our lives easier. They give you instant power ... no matter where you are! Find out how they work and other cool stuff about batteries in this issue. (Fancy making your own? See page 5!) Go ahead and get a “charge” out of chemistry!