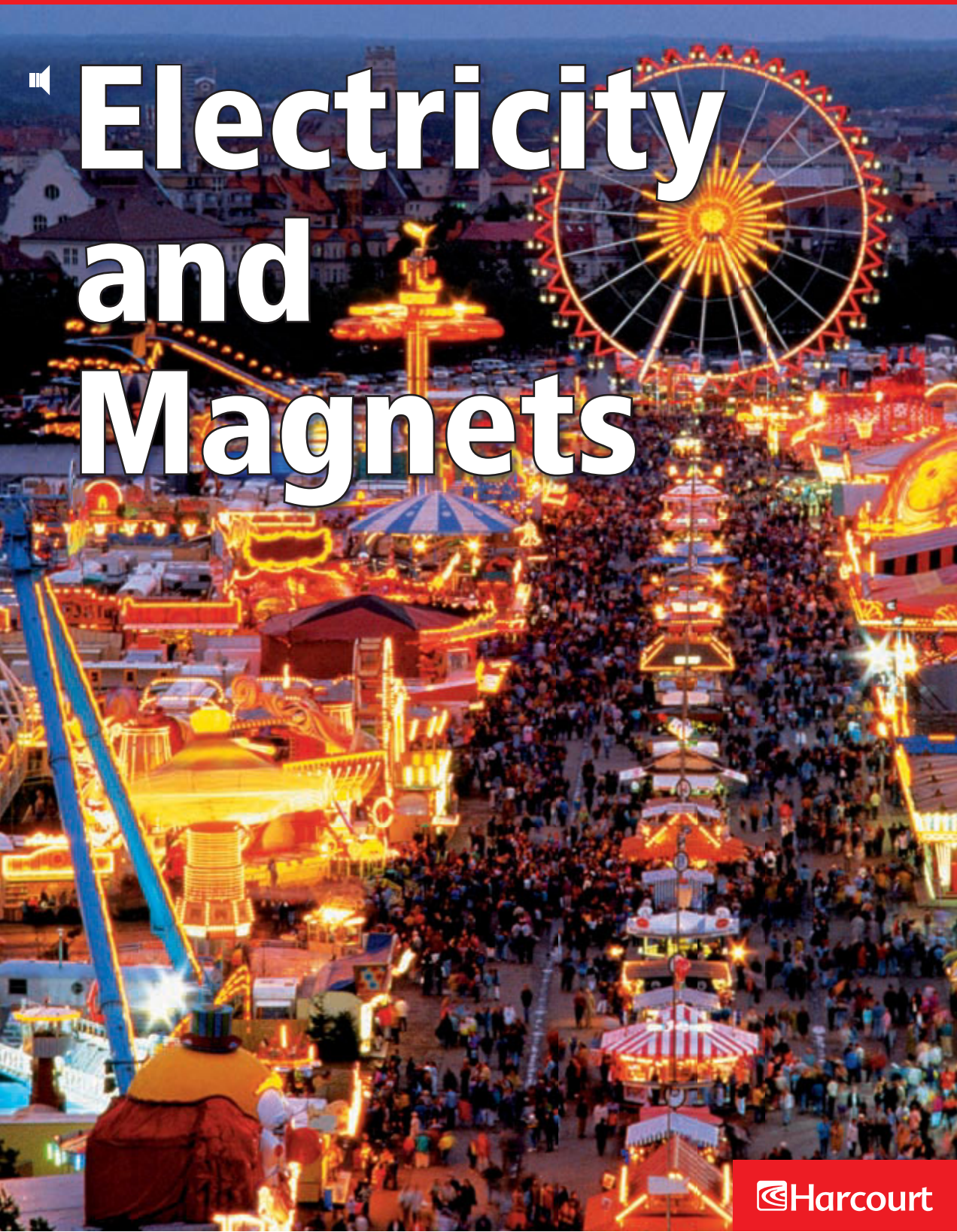
Electricity and Magnets



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Electricity and Magnets

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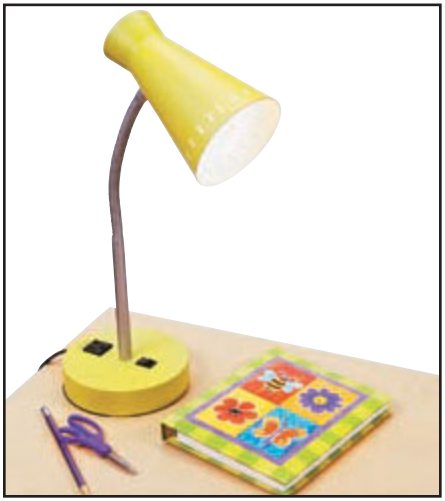
Lesson 1

What Is Electricity?

VOCABULARY

- static electricity
- current electricity
- circuit

Static electricity is an electric charge that builds up on an object. Static electricity can cause a person's hair to stand up.



Current electricity is electricity that moves through a wire.

A **circuit** is a path that electricity follows. In the path above, electricity moves from the wall outlet, through the mixer, and back to the wall.

Focus Skill

READING FOCUS SKILL

MAIN IDEA AND DETAILS

A **main idea** is what the text is mostly about. **Details** tell more about the **main idea**. Look for **details** about different kinds of electricity.

Static Electricity

There is more than one kind of electricity. **Static electricity** is an electric charge that builds up on an object.

Lightning is static electricity. An electric charge builds up in a cloud. The static electricity then moves to the ground as lightning.

Focus Skill **What is static electricity?**

▼ Lightning flash

▲ Current electricity runs the mixer's motor.

Current Electricity

Current electricity is another kind of electricity. **Current electricity** is electricity that moves through a wire.

When you turn on a lamp, current electricity moves from wires in the wall, through the plug, and into the lamp's wires. It moves through the lamp and lights the bulb. Then it flows back to the wires in the wall. This path that electricity moves through is called a **circuit**. The bulb will not light if there are any breaks in the circuit.

Focus Skill **What is current electricity?**

How People Use Current Electricity

People use current electricity in many ways. Current electricity is used to light, heat, and cool homes. It is used to run motors. It is used to cook food, too.

Focus Skill **Tell how people use current electricity.**

▼ Electricity lights this amusement park.

How Electricity Moves

Electricity moves through some things. It does not move through other things. Something that electricity can move through is called a *conductor.* Copper wire is a good conductor.

Something that electricity cannot move through is called an *insulator.* Wood and plastic are insulators. Insulators protect people from electricity.

Focus Skill **Tell what conductors and insulators do.**

▼ **Some gloves can be insulators.**

Review

Focus Skill

Complete the main idea statement.

1. There is more than one kind of _____.

Complete the detail statements.

2. _____ is an electric charge that builds up on objects.
3. Electricity that moves through wires is called _____.
4. Electricity will not move through an _____.

Lesson 2

What Are Magnets?

VOCABULARY

magnetic

Magnetic things pull objects made of iron toward them. This metal bar is magnetic. It holds kitchen tools made of iron.

READING FOCUS SKILL

COMPARE AND CONTRAST

When you **compare and contrast**, you tell how things are alike and different.

Look for ways to **compare and contrast** magnets.

Magnets

Magnets are made from metal that is magnetic. **Magnetic** things can pull objects made of iron toward them.

A magnet can pick up and hold steel paper clips. That is because steel has iron in it. It cannot pick up plastic clips. Plastic has no iron in it.

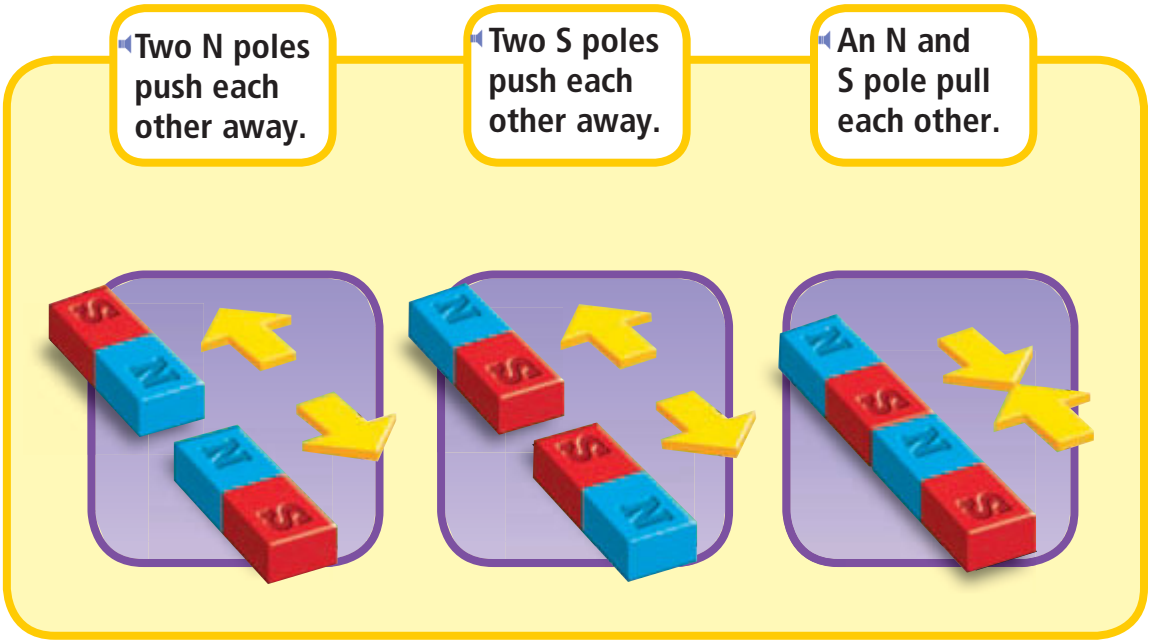
Magnets pick up steel paper clips. ▶

All magnets have two ends called poles. One end is the N, or north-seeking pole. The other is the S, or south-seeking pole.

Poles that are the same push each other away. If two N poles are near each other, they push each other away. Two S poles also push each other away.

Opposite poles pull toward each other. An N pole and S pole pull toward each other.

Focus Skill **Tell how all magnets are alike.**



Some Uses of Magnets

Magnets have many uses. In homes, magnets keep doors closed. They hold papers. Magnets are used in tools. Some games use magnets.

▲ These letters are magnetic.

◀ Magnets keep doors closed.

Magnets are also used to make electricity. They are used in machines. They help sort metals, too.

Focus Skill **Name different uses of magnets.**

Magnets can help sort metal. ▶

Review

Focus Skill **Complete these compare and contrast statements.**

1. All magnetic objects can pull objects that are made of _____.
2. All magnets have two ends called _____.
3. Two S poles _____ each other away.
4. An N pole and S pole _____ toward each other.

Lesson 3

How Are Electricity and Magnets Related?

VOCABULARY

generator

A **generator** is a machine that uses a magnet to make electricity.

Focus Skill

READING FOCUS SKILL

MAIN IDEA AND DETAILS

A **main idea** is what the text is mostly about. **Details** tell more about the **main idea**.

Look for **details** about electromagnets and generators.

Electromagnets

Some magnets use electricity to work. They are called electromagnets. Electromagnets can be turned on and off. They are made of iron or steel. Some are used to lift heavy things like old cars.

Electromagnet ▶

It is easy to make an electromagnet. First, wrap wire around a screw. Then connect both ends of the wire to a battery. This makes a circuit. The electricity from the battery makes the screw a magnet.

How can you turn the magnet off? Disconnect a wire. The circuit is broken. The screw is no longer a magnet.

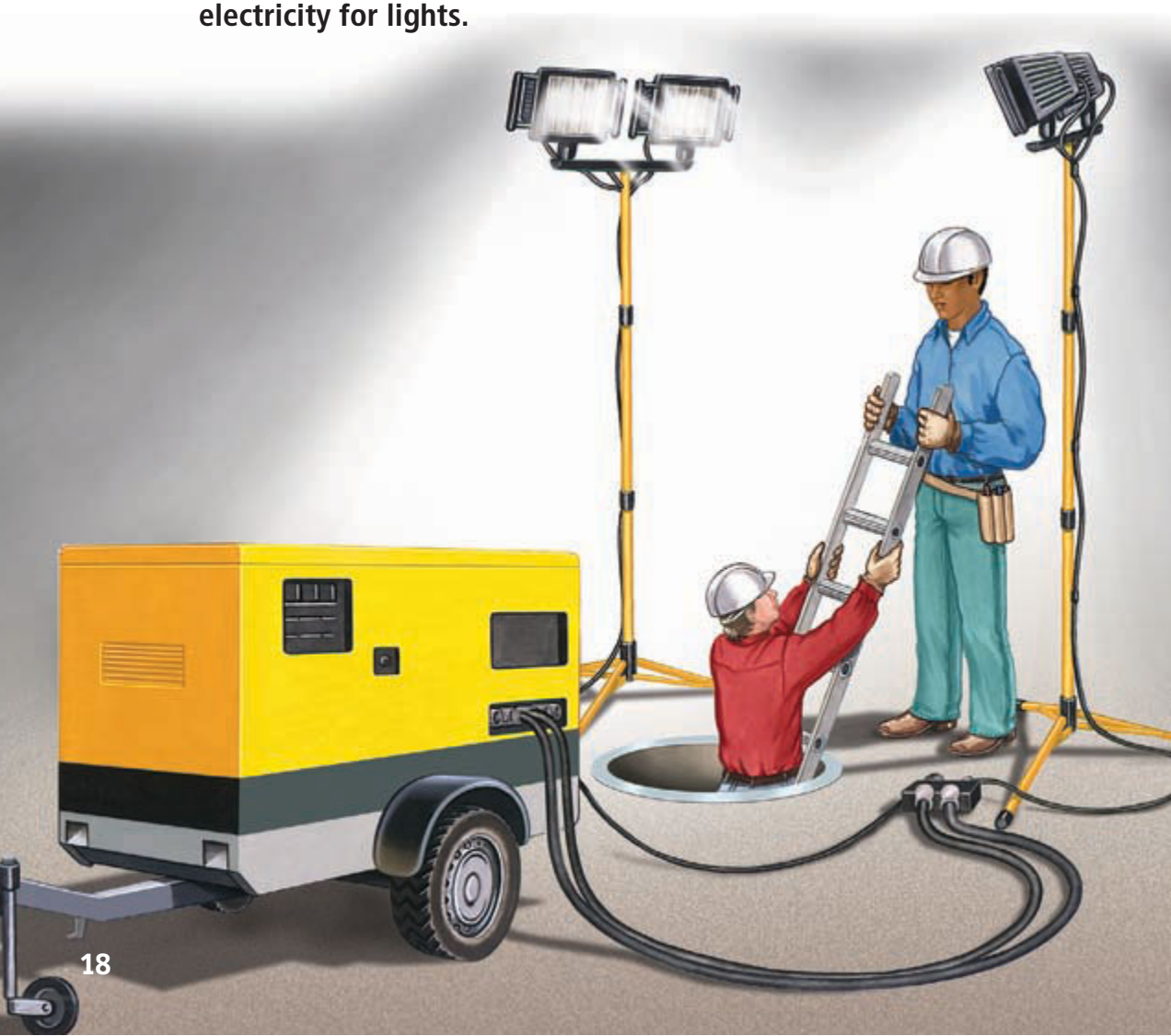
Focus Skill **Tell how to make an electromagnet.**

Electricity can make a screw an electromagnet. ▼

Generators

An electromagnet uses electricity to make a magnet. A generator does just the opposite. A **generator** uses a magnet to make electricity.

▼ A generator makes electricity for lights.



In a generator, a coil of wire is moved near a magnet. This causes electricity to flow in the wire. This is one way electricity is made.

Focus Skill

Explain the difference between an electromagnet and a generator.

Generators are used during power failures. ▶

Review

Focus Skill

Complete this main idea statement.

1. Electromagnets and _____ are useful tools that help people.

Complete these detail sentences.

2. _____ use electricity to make magnets.
3. Generators use magnets to make _____.

GLOSSARY

circuit (SER•kuht) A path that electricity follows (5)

current electricity (KUR•uhnt ee•lek•TRIS•uh•tee) Electricity that moves through a wire (5)

generator (JEN•er•ayt•er) A device that uses a magnet to make a current of electricity (18)

magnetic (mag•NET•ik) Attracting objects that have iron in them (10)

static electricity (STAT•ik ee•lek•TRIS•uh•tee) An electrical charge that builds up on an object (4)

Think About the Reading

1. Describe two kinds of electricity and explain how they are different.
2. Explain how to make magnets push and pull each other. Describe how an electromagnet and a regular magnet are alike and different.

Hands-On Activity

Use a screw, wire, and battery to make an electromagnet.

1. Test your electormagnet. Explain how to turn it on and off.
2. Compare your electromagnet to other magnets, such as a bar or horseshoe magnet. Which is strongest?

School-Home Connection

Go on a magnet hunt in your home. List each magnet you find. Then write a sentence telling how it is used. Talk with family members about how magnets are useful in daily life.

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