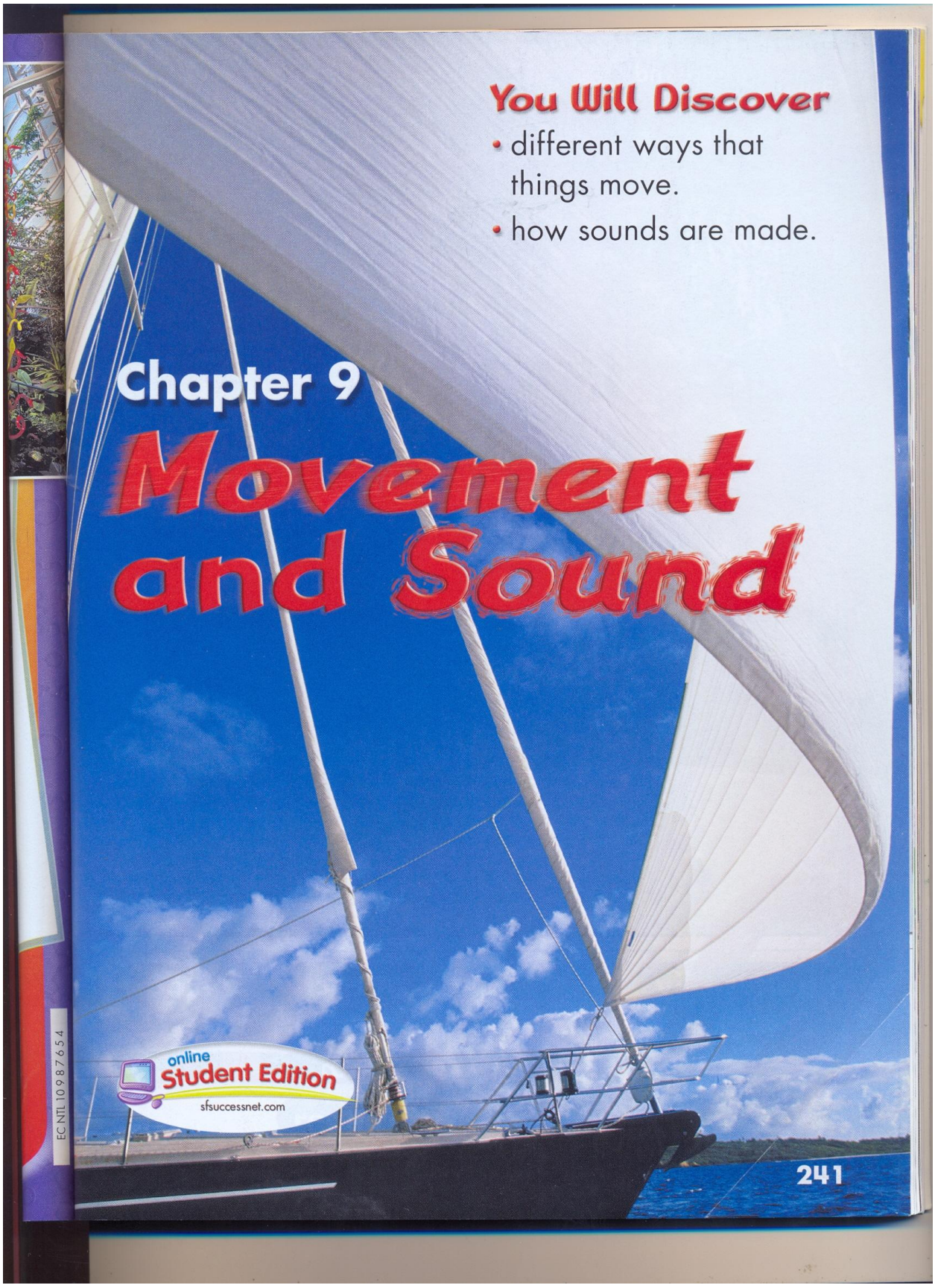

You Will Discover

- different ways that things move.
- how sounds are made.

Chapter 9

Movement and Sound

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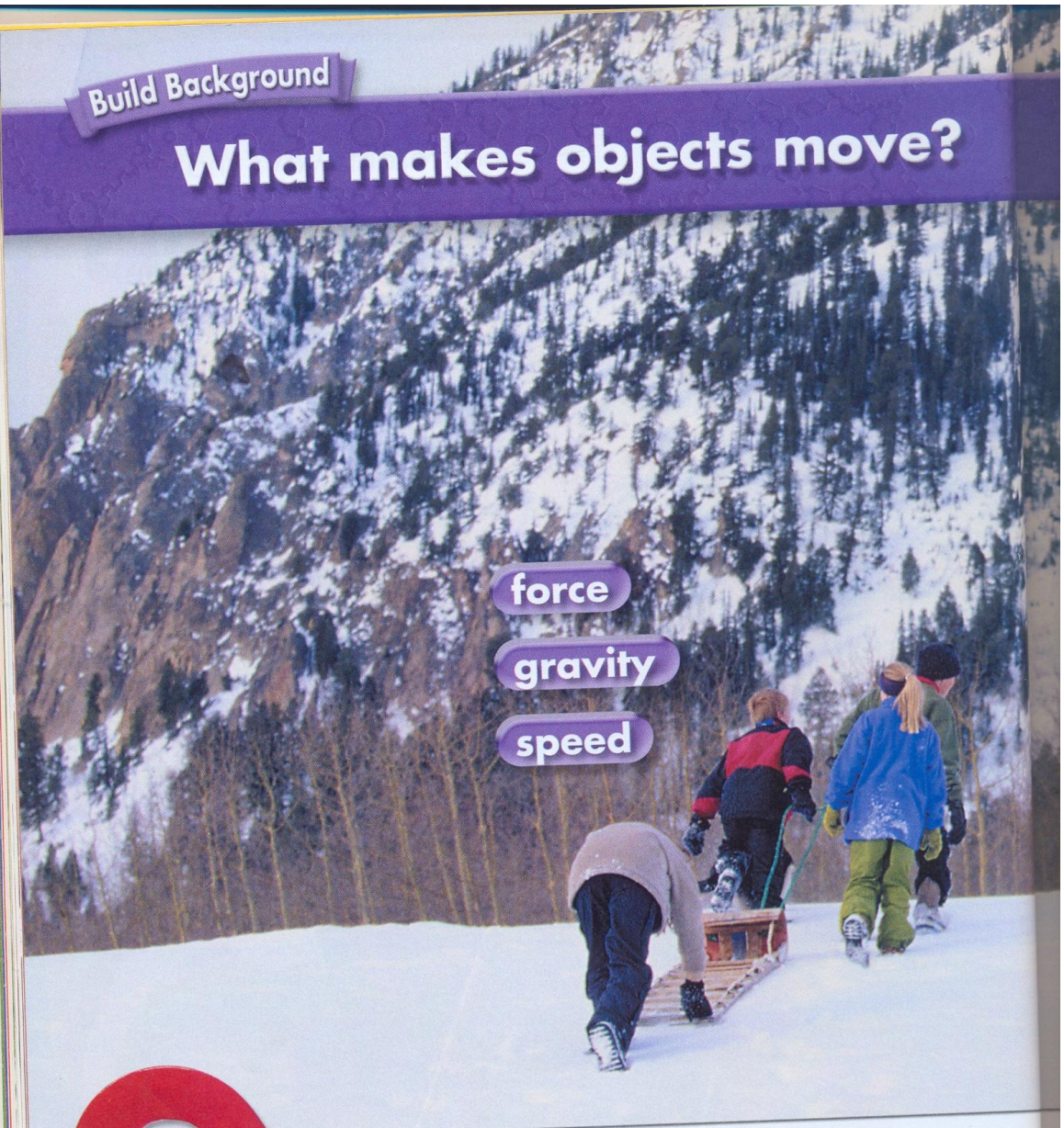
Build Background

What makes objects move?



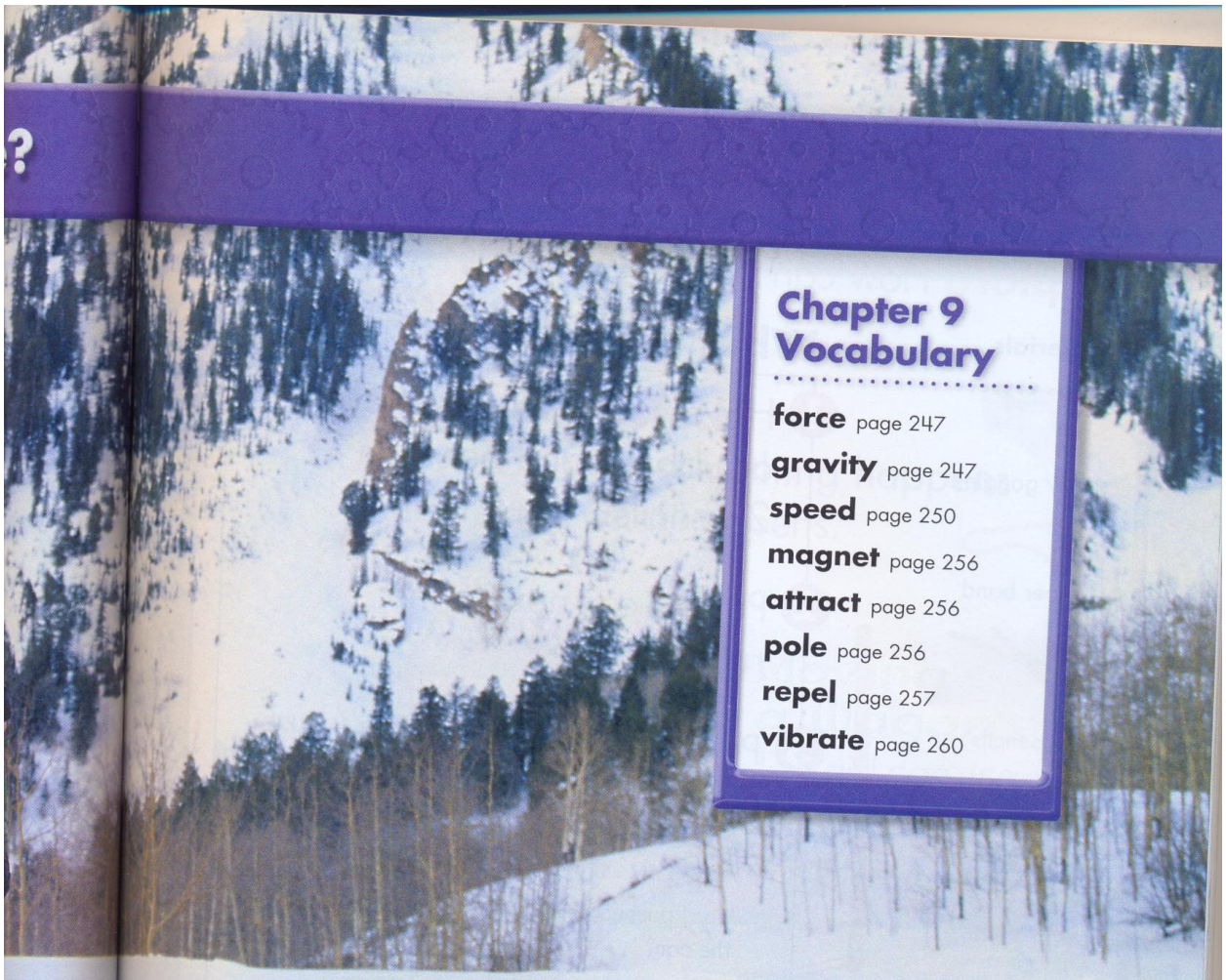
force

gravity

speed

magnet

attract



Chapter 9 Vocabulary

pole

repel

vibrate

Vibrate means to move back and forth very fast.

Lab zone Directed Inquiry

Explore How can you move the car?

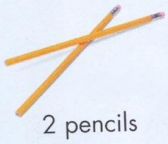
Be careful!

Wear your safety goggles.

Materials

safety goggles

rubber band

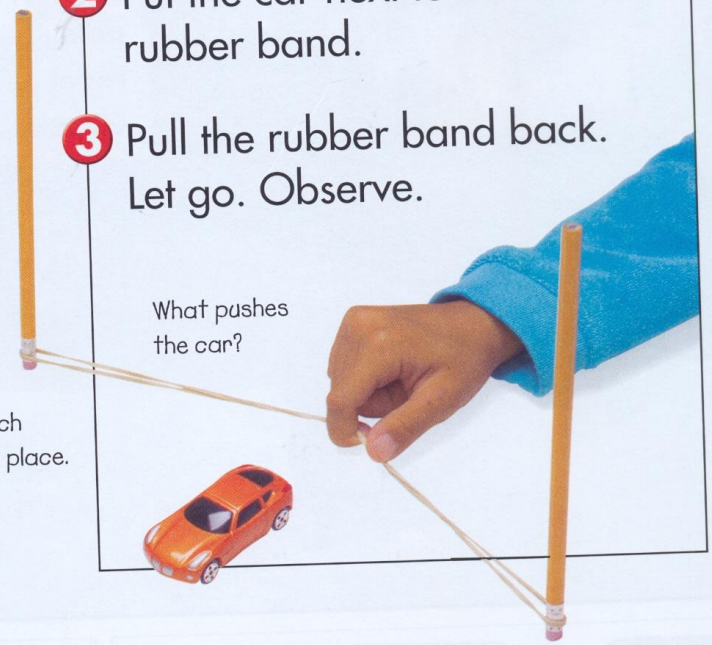


2 pencils

toy car

What to Do

1. Have your partners stretch a rubber band between 2 pencils.
2. Put the car next to the rubber band.
3. Pull the rubber band back. Let go. Observe.



Process Skills

Predict means to tell what you think might happen.

Explain Your Results

Predict What would happen if you pulled the rubber band farther back?

How to Read Science

Reading Skills

TARGET SKILL

Cause and Effect

A cause is why something happens. An effect is what happens.

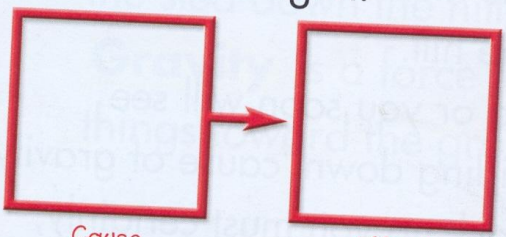
Science Story

Moving a Wagon

The girl can use the wagon to move her toy.

Apply It!

Suppose the girl starts pulling the wagon. **Predict** what effect that will have on the wagon.

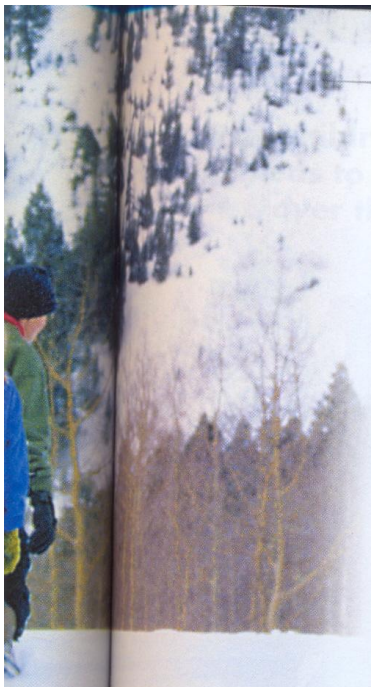


You Are There

Pull the Sled!

Sung to the tune of "Three Blind Mice"
Lyrics by Gerri Brioso & Richard Freitas/The Dovetail Group, Inc.

Pull the sled.
Pull the sled.
Pull it up the hill.
Pull it up the hill.
Don't let go or you soon will see
The sled sliding down 'cause of gravity.
To get it back up you must certainly,
Pull the sled!



Lesson 1

What makes things move?

The children use force to move the sled to the top of the hill.

Force is a push or a pull that may make something move.

Suppose the children let go of the sled.

Whoosh! Gravity pulls the sled down the hill.
Gravity is a force that pulls things toward the ground.

Using Force

The children use force to move the sleds. The children use a little force to pull the sleds over the snow.

Snow can be very heavy. Look at the girl in the picture below. The girl uses a lot of force to move the heavy snow.

Suppose the girl drops the shovel. Gravity will pull it to the ground.

These children pull the sleds to move them over the snow.

Lesson Checkpoint

1. What is gravity?

2. **Writing** in Science Write in your **science journal.** Tell how the children use force to make the sled move.

Lesson 2

What is speed?

Force can change the way things move. The child pushes the car with a lot of force. The car moves quickly.

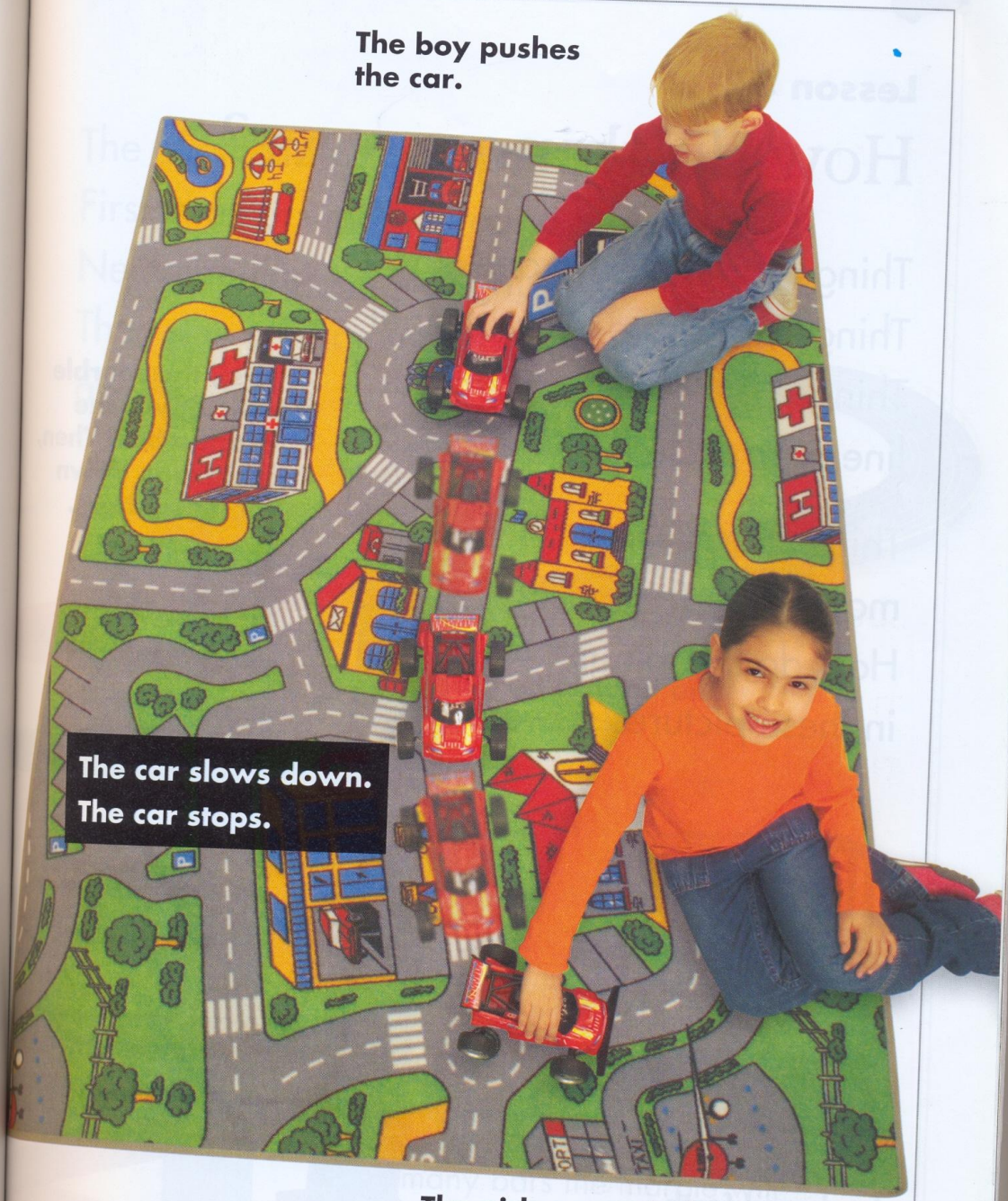
The car has a lot of speed. **Speed** is how quickly or slowly something moves.

The child pushes the car with less force. The car will move at a slower speed.

Lesson Checkpoint

1. What is speed?
2. **Cause and Effect** What causes the car to have a lot of speed?

The boy pushes the car.



The car slows down.
The car stops.

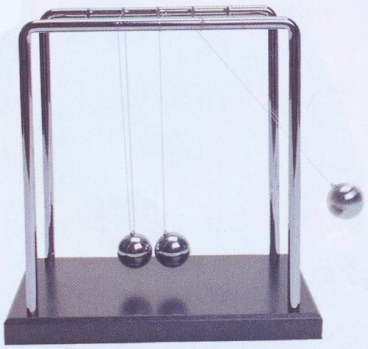
The girl can push the car in another direction.

Lesson 3

How do things move?

Things can move up and down.
Things can move left and right.
Things can move in a straight line or in a circle.

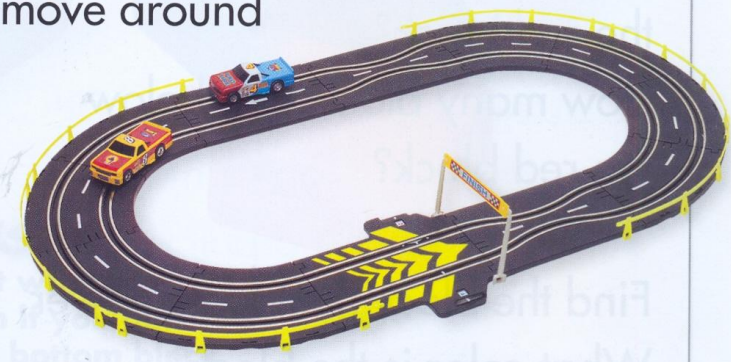
Things can even move in a zigzag.
How do the things in these pictures move?



The shiny balls move back and forth.

First, the marble rolls down the orange bar. Then it zigzags down the other bars.

The cars follow the path of the track.
First, the cars move around one curve.
Next, the cars go straight.
Then, the cars move around another curve.



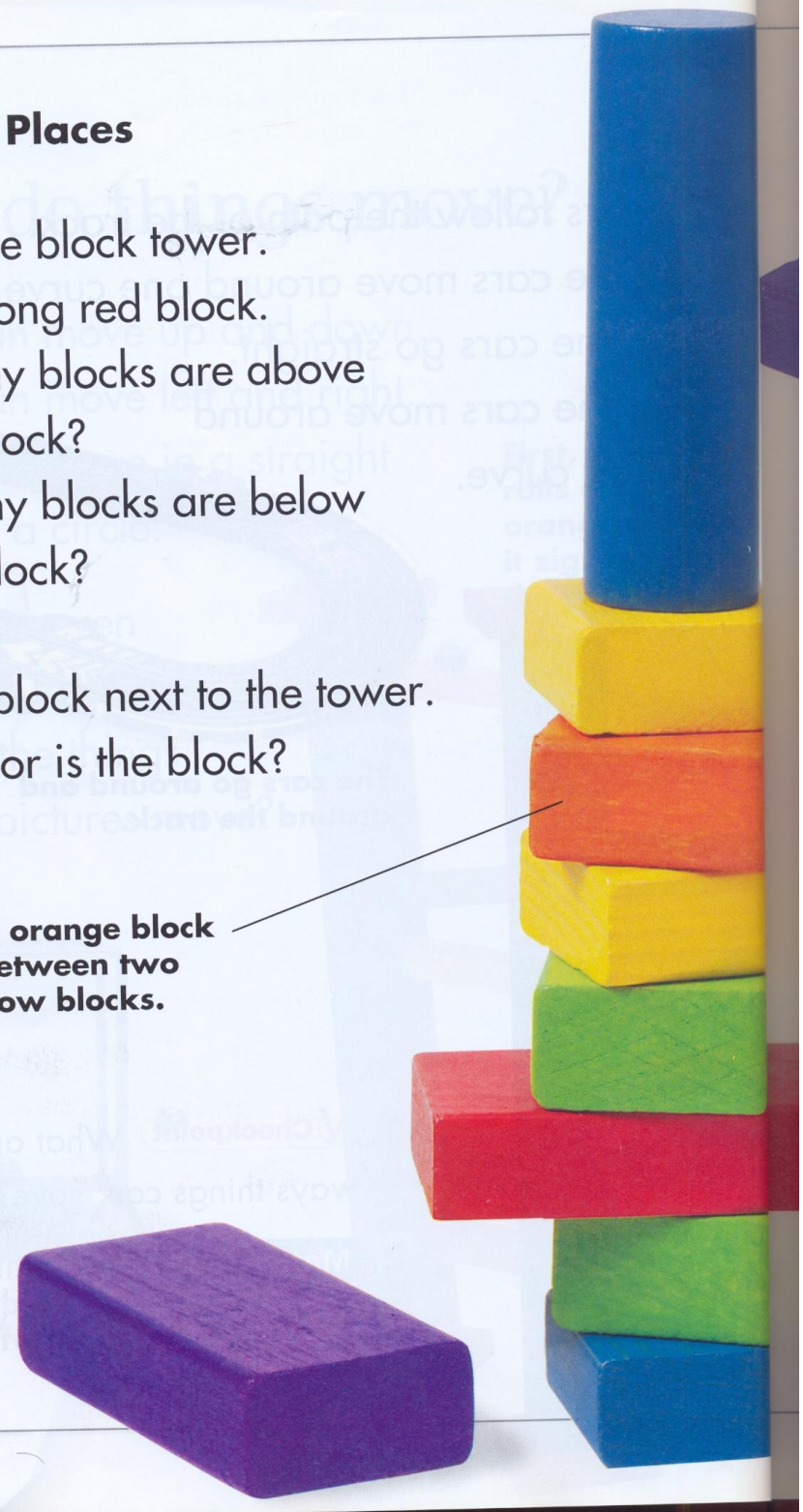
The cars go around and around the track.

1. **Checkpoint** What are some ways things can move?
2. **Math** in Science Count how many bars the marble will roll down.

Different Places

Look at the block tower.
Find the long red block.
How many blocks are above the red block?
How many blocks are below the red block?

Find the block next to the tower.
What color is the block?



This orange block is between two yellow blocks.

Crash!

Look at what can happen if you pull out the bottom block.

Lesson Checkpoint

1. Write in your **science journal.** Tell what is above you, below you, and next to you.
2. **Cause and Effect**
   Suppose you move the orange block in the tower. How might this affect the blocks next to the orange block?

Lesson 4

What do magnets do?

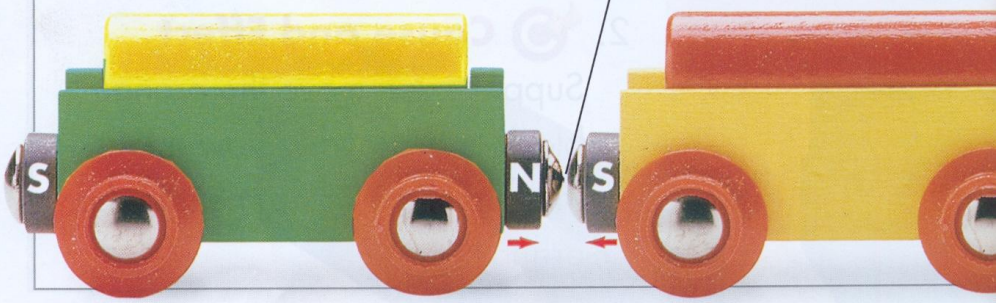
What holds the train cars together?
Magnets do!

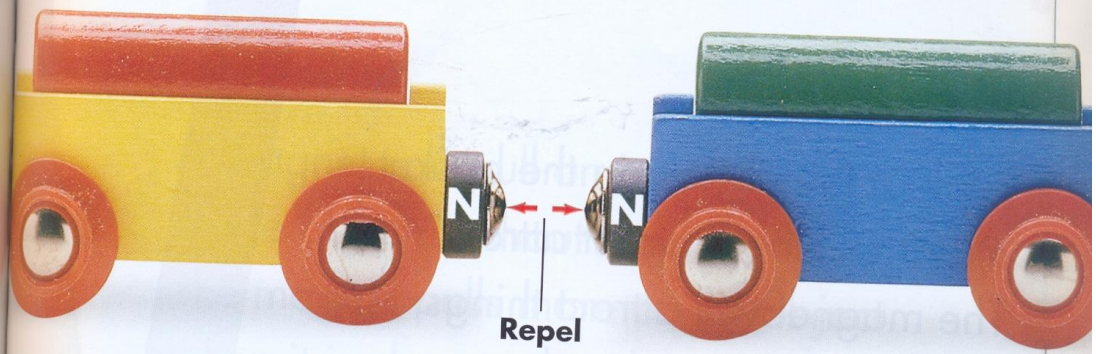
A **magnet** is an object that attracts some kinds of metal.
Attract means to pull toward.

N stands for north pole. S stands for south pole.

A magnet has two poles.
A **pole** is at the end of some magnets.
Every magnet has a north pole and a south pole.

Different poles attrac each other. A north pole and a south pol attract each other.

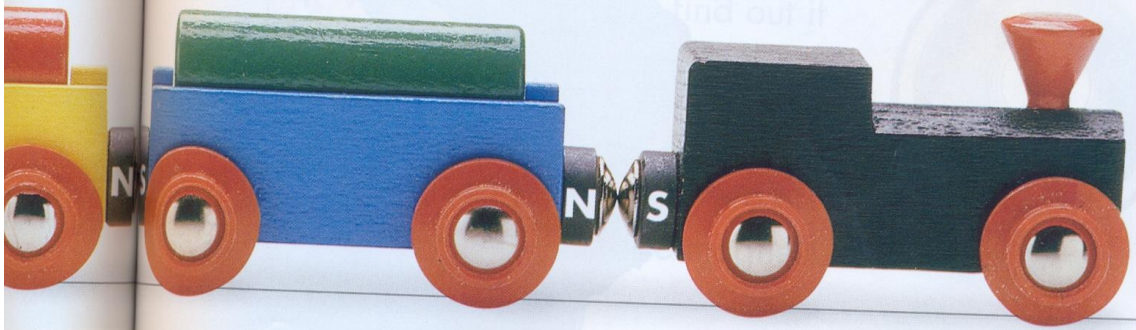




Suppose you turn one train car around.
Now two north poles are by each other.
The two north poles repel each other.
Repel means to push away.
Poles that are the same will repel each other.

1. **Checkpoint** When do magnets attract each other?

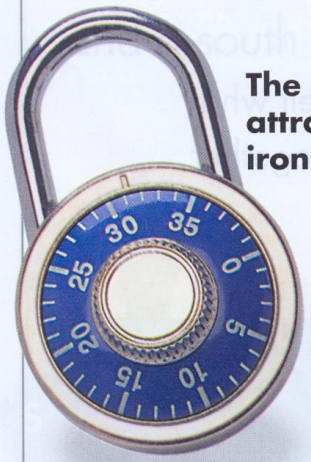
2. **Writing** in Science Write a sentence. Tell what will happen if you put two south poles together.



Pulling Metal

Look at the objects in the basket.
What will the magnet attract?
The magnet will attract things
made of iron.
Iron is one kind of metal.

The penny does not have iron in it. The magnet does not attract a penny.



The magnet attracts this iron lock.

A magnet can pull on an object made of iron without touching it. The magnet pulls more on an object when it is close to the object.

The magnet will not attract this plastic pail.

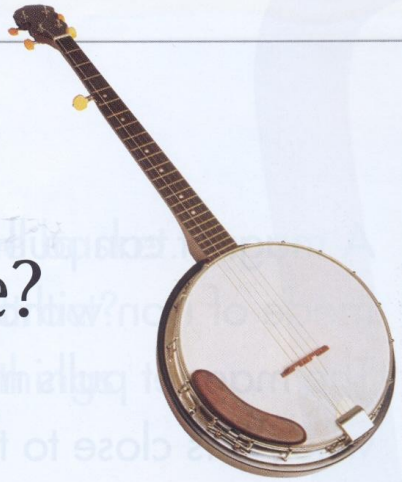
Lesson Checkpoint

1. What is one way to find out if something has iron in it?
2. **Writing in Science** Write in your **science journal.** Make a list of ways that people use magnets.

Lesson 5

How are sounds made?

When a sound is made something vibrates.
Vibrate means to move back and forth very fast.



Gently pluck a string on the banjo. It sounds soft. Pluck the string harder. Now it sounds loud.

Parts of the banjo vibrate when you pluck the strings. The vibrating parts make sounds.

Give the top of the drum a gentle tap. The top of the drum will vibrate. The top of the drum will make a soft sound.

Lesson Checkpoint

1. How does a banjo make a sound?
2. **Health** in Science Loud sounds can hurt your ears. What might you do to protect your ears?

Lesson 6

What sounds are around us?

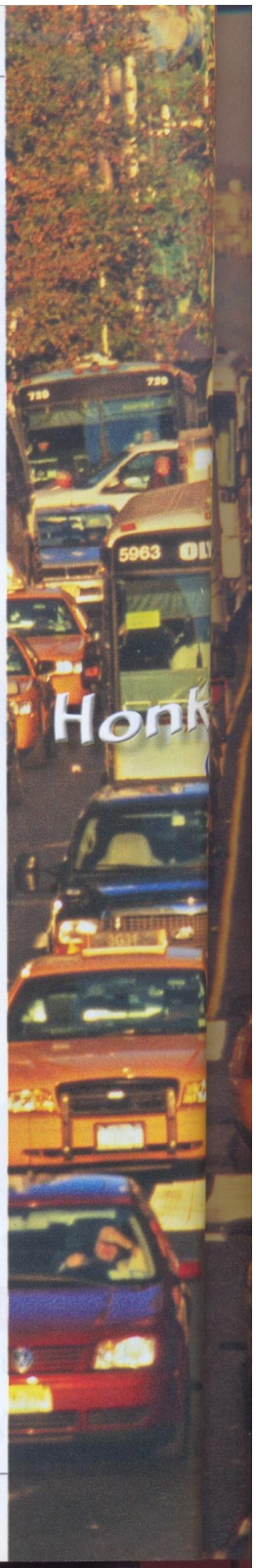
Suppose you were on this street.
What sounds might you hear?

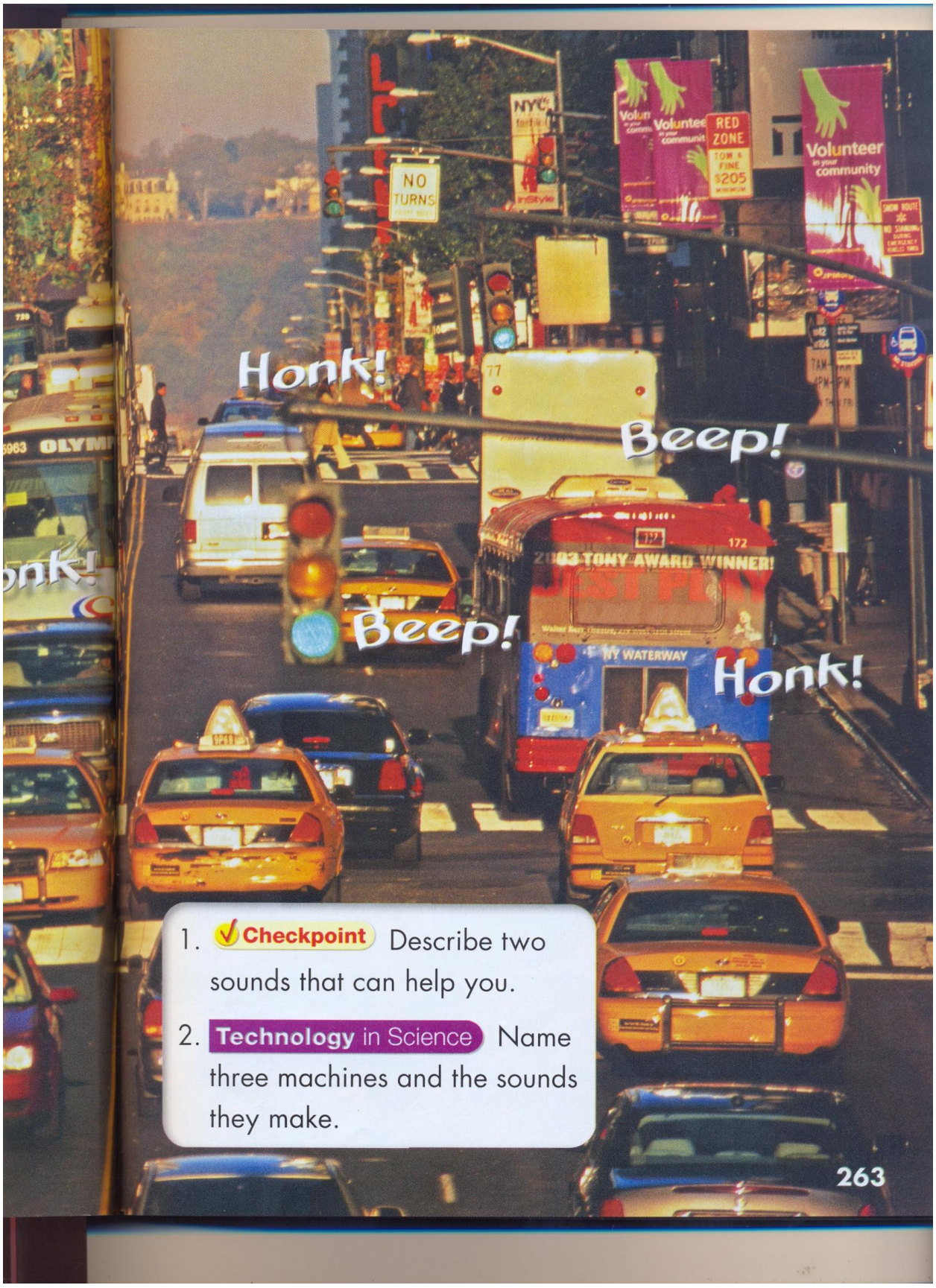
You might hear sirens.
You might hear honks.
You might hear beeps.

Honks, beeps, and sirens tell us to be careful.

Zoom!

Look up! What makes that sound in the sky?





1. **Checkpoint** Describe two sounds that can help you.
2. **Technology** in Science Name three machines and the sounds they make.

Sounds of Nature

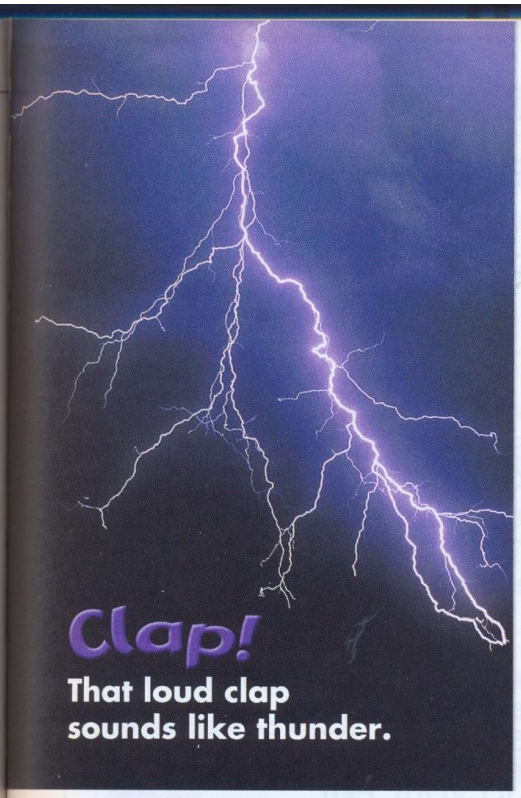
Many things in nature make sounds.
Look at these pictures.
What sounds might you hear?

Lesson Checkpoint

1. What sounds in nature might be loud?
2. **Social Studies** in Science What sounds might you hear in your neighborhood?

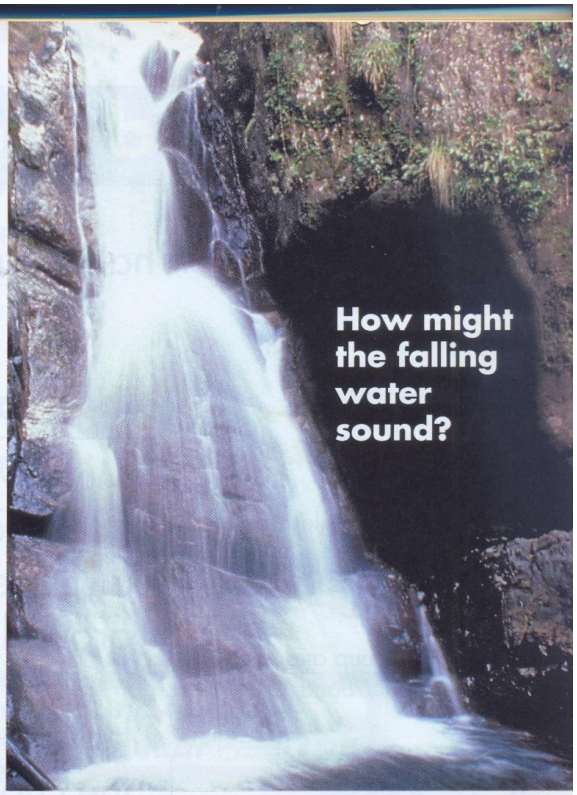
Chirp! Chirp!

That chirping sounds like baby birds.

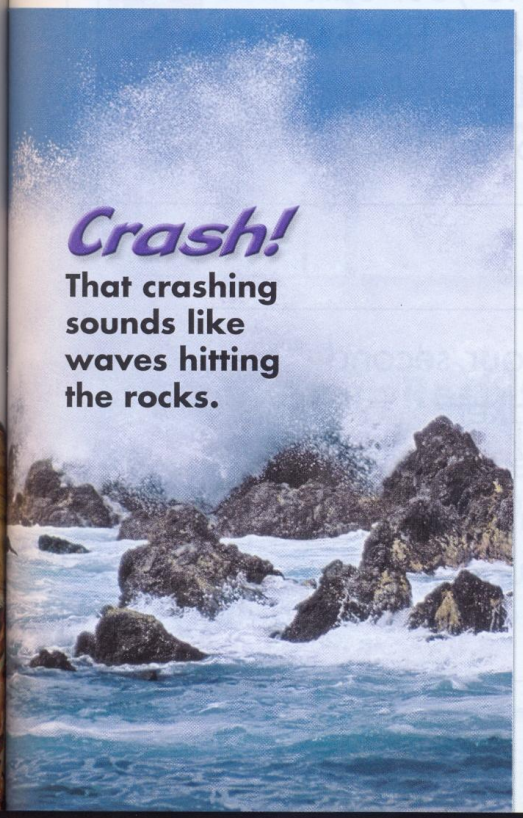


Clap!

That loud clap sounds like thunder.

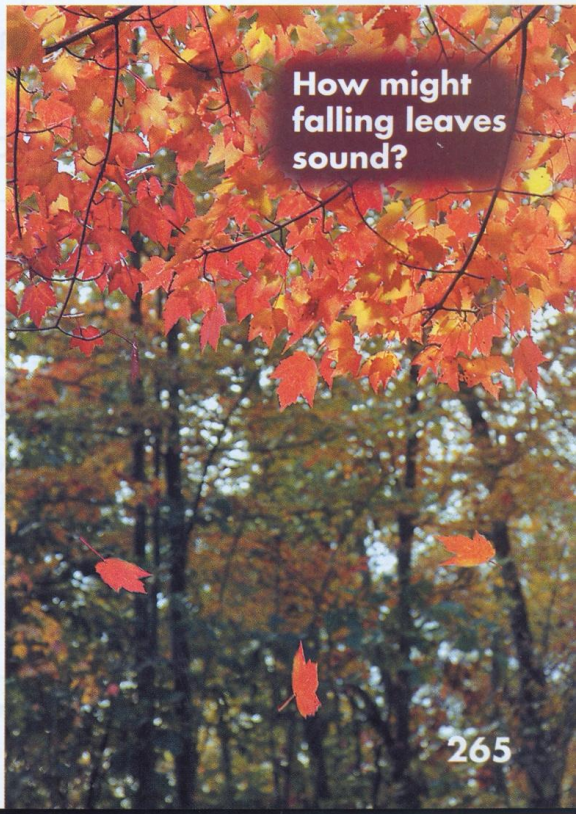


How might the falling water sound?



Crash!

That crashing sounds like waves hitting the rocks.



How might falling leaves sound?

Lab zone

Guided Inquiry

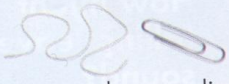
Investigate What do you hear?

Materials

safety goggles

plastic cup and rubber band

paper cup with hole in bottom

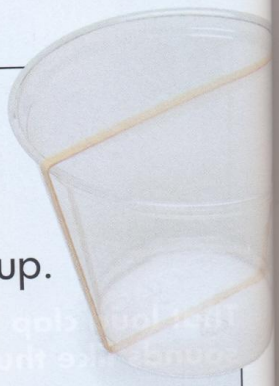


string and paper clip

cup with water

What to Do

1. Make your first noisemaker. Stretch a rubber band around the plastic cup.



2. Hold the bottom of the cup to your ear. Pluck the rubber band gently. Listen. Record what you hear.

Be careful!

Wear your goggles!

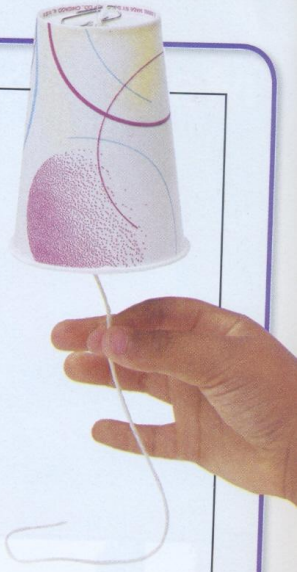
3. Make your second noisemaker. Push the string through the hole in the cup.

Process Skills

You **infer** when you answer a question using what you have learned.

4. Tie the paper clip on the outside of the cup. Wet the string.

5. Hold the cup. Pull down on the wet string with your fingers. Listen. Record what you hear.



Noisemaker	Does it sound like a duck or a guitar?
	
	

Explain Your Results

1. **Infer** Why do you think you hear the different sounds?
2. What instruments do you know that vibrate?

Go Further

What sound would you hear if you use a dry string? Try it and find out.

Math in Science

Speed

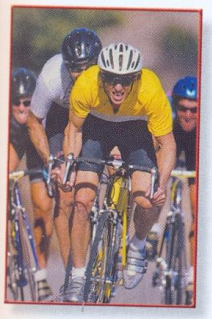
Moving At Different Speeds

slowest → slower → sl

Use the pictures to answer the questions.

1. What two things are faster than a car?
2. What is slower than a turtle?

slow



fast

faster

fastest

Lab zone Take-Home Activity

Find pictures of six things that move. Put them in order from slowest to fastest.

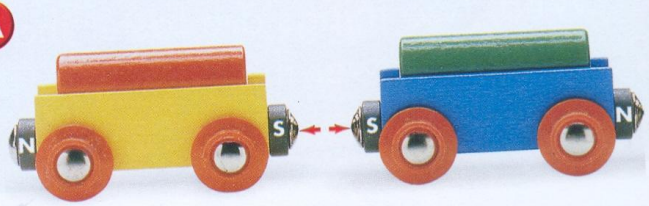
Chapter 9 Review and Test Prep

Vocabulary

Which picture goes with each word?

1. attract
2. pole
3. repel

A



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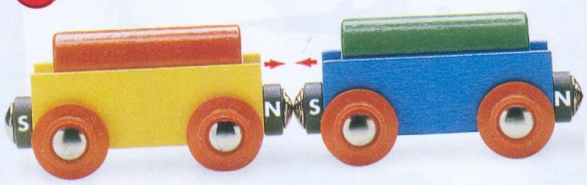


C

What did you learn?

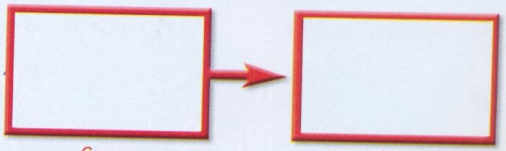
4. What makes things move?
5. What force pulls things toward the ground?
6. What are three different ways that things can move?
7. What is speed?
8. How are sounds made?

Process Skills

9. Infer What might happen if you hit the top of a drum hard?

Cause and Effect

10. You cause a bike to move by pushing the pedals. Suppose you push harder. What effect will that have on how the bike moves?



Test Prep

Fill in the circle next to the correct answer.

11. What happens to magnets if you try to touch their south poles to each other?

Ⓐ They attract.
Ⓑ They vibrate.
Ⓒ They repel.
Ⓓ They pull.

12. **Writing** in Science Write two sentences. Tell what happens when magnets attract and repel some things.