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A CLOSER LOOK

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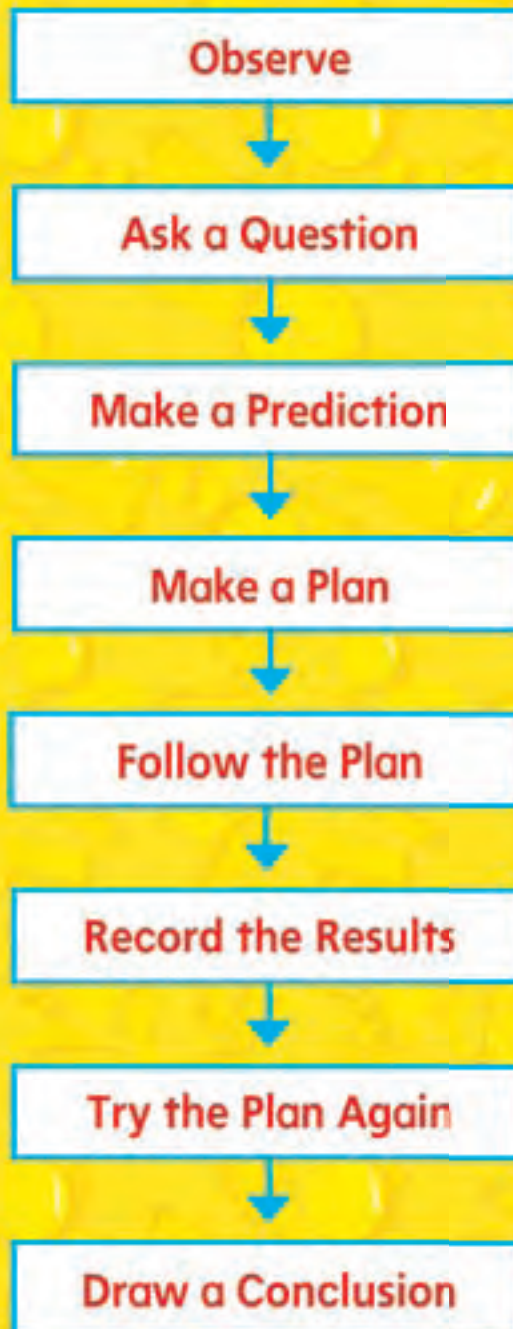
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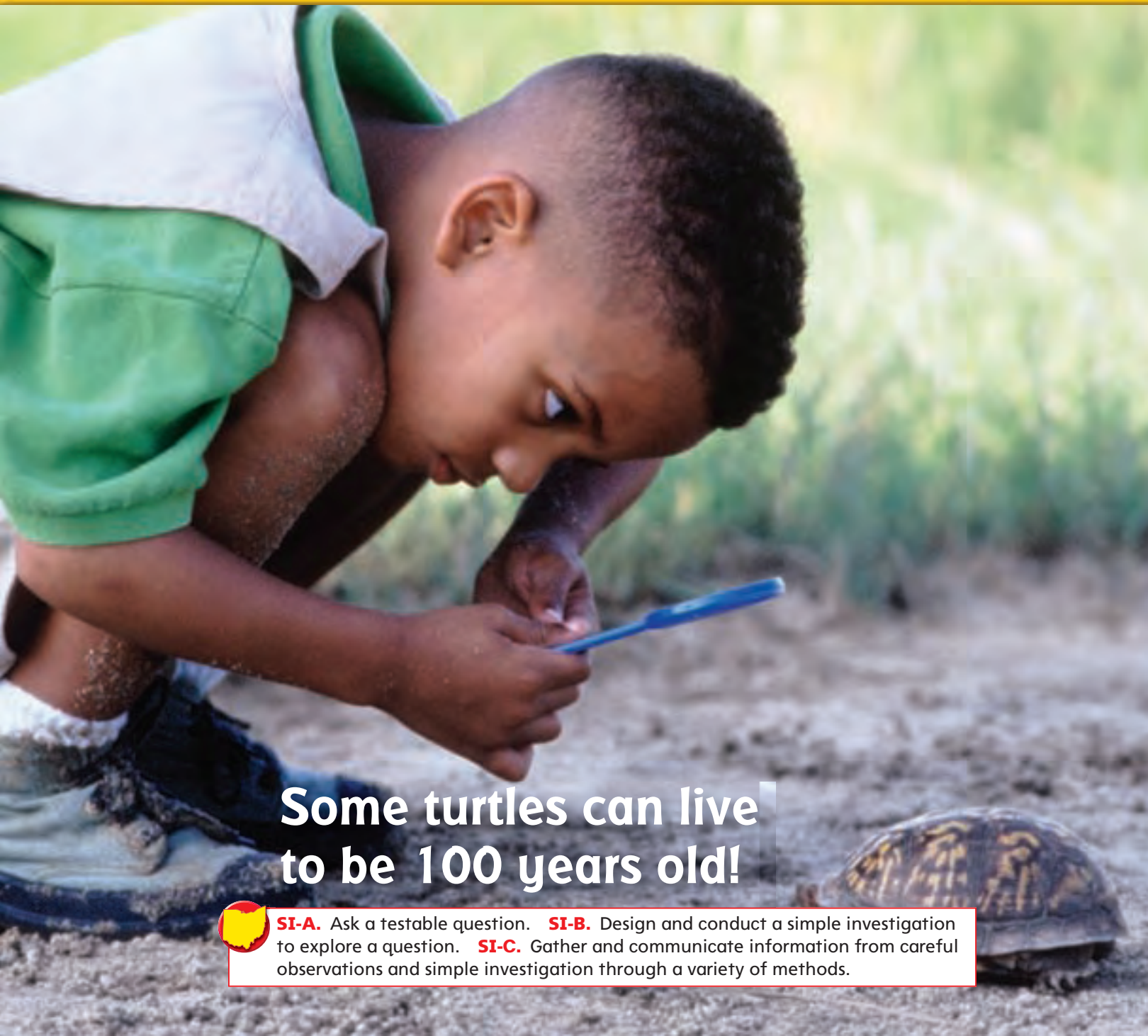
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Be a Scientist



Some turtles can live
to be 100 years old!



SI-A. Ask a testable question. **SI-B.** Design and conduct a simple investigation to explore a question. **SI-C.** Gather and communicate information from careful observations and simple investigation through a variety of methods.



Science Skills

Look and Wonder

Have you ever wondered about animals? Scientists wonder about things in our world, too.



What do you notice about these animals?

What to Do

- 1 Look at the animals on this page.
- 2 How are the animals alike? How are they different?
- 3 Put the animals into groups. Tell a classmate why you put the animals in each group.

Explore More

- 4 Think of other animals that you could add to your groups.



What do scientists do?

You observed animals to see what they were like. Scientists observe things, too. You can be a scientist!

When you **observe** something, you carefully look, hear, taste, touch, or smell it.

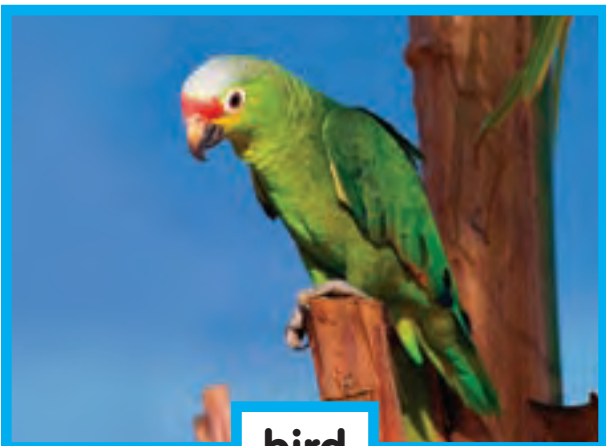
Observe What can you observe about these animals?



dog



fish



bird



butterfly

Scientists can compare and classify animals to learn more about them.

Compare means to see how things are alike or different. **Classify** means to group things by how they are alike.

Compare and Classify

Sort these animals into groups.



koala



flamingo



ladybug



snake

How do scientists work?

Scientists also measure things. **Measure** means to find out the size or amount of something. Measuring can help scientists **put things in order**, or tell which comes first, next, and last.

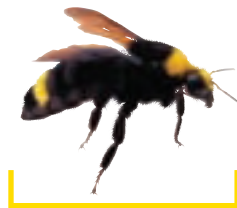
Measure Use a ruler to measure these insects.



butterfly



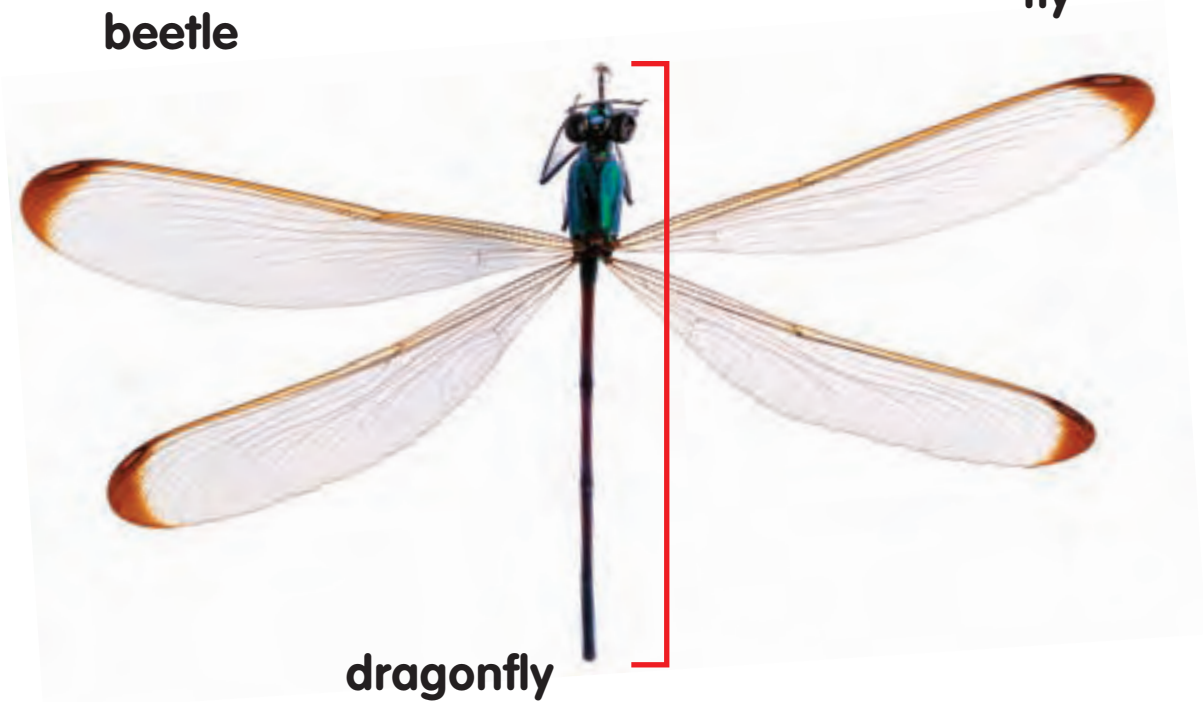
beetle



bee



fly



dragonfly

Scientists can make a chart to **record data**, or write down what they observe. They can also **make a model** to show how something looks or works.

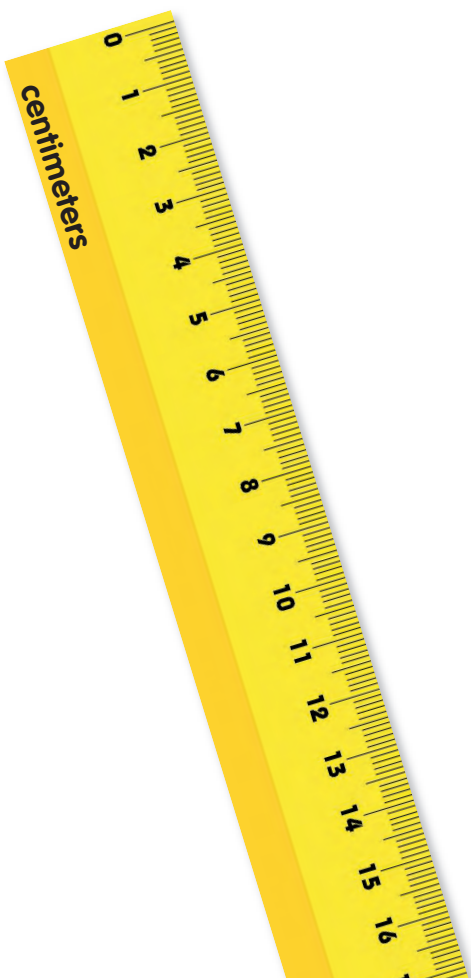







Make a Model

When you write or tell your ideas to others you **communicate** what you have learned.

Communicate

What does this chart tell you about insects?



Insect	Length
fly 	1 centimeter
beetle 	2 centimeters
bee 	3 centimeters
butterfly 	5 centimeters
dragonfly 	8 centimeters

How do scientists learn new things?

Scientists **infer**, or use what they know to figure something out.

Scientists also **predict**, or use what they know to tell what they think will happen.



Infer

It is winter. You can infer that there is not a lot of food for the bird to eat.



Predict

The bird is hungry. You can predict that it will eat the food in the feeder.

Then scientists **investigate** by making a plan and following it.

They can **draw conclusions**, or use what they observe to explain what happens.

Investigate

To investigate, you can try to feed the bird different seeds.



Draw Conclusions

If there are no sunflower seeds left, you can draw the conclusion that the bird liked them best.



Think, Talk, and Write

1. Describe what scientists do to learn more about our world.
2. Write a list of things that you want to know more about.

A large snail with a brown, spiral shell is moving across a dark, mossy rock. The background is a lush forest scene with a stream flowing over rocks, surrounded by various green ferns and plants.

Scientific Method

Look and Wonder

Have you ever wondered about snails? What could you do to find out about them?



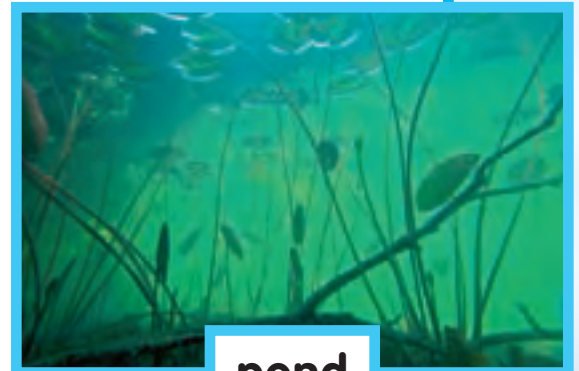
Where can snails live?

What to Do

- 1 Observe.** Snails can live in ponds or gardens. Look closely at the pictures of each one.
- 2 Compare.** How is the pond the same as the garden? How is it different?
- 3 Record Data.** Draw and label the things you see in the pond and the garden.
- 4 Draw a Conclusion.** What do you think a garden snail might eat? What might a pond snail eat? Why?



garden



pond



What do snails like to eat?

Scientists make plans. Their plan is called the scientific method. You can use this plan, too!

Mr. Lopez's science class made a plan to find out what snails eat.



Observe



Ask a Question

What do garden snails eat?

Make a Prediction

Garden snails eat garden plants.

Like scientists, the children wrote their plan down so others could follow it.

The plan was to give the snails garden plants and jelly beans. Then the children observed the snails and recorded what they ate.

Make a Plan



Follow the Plan

Record the Results



What did the children find out?

The children found out that snails eat garden plants.

Like scientists, they wanted to be sure. They tried their experiment again. They got the same results.



Try the Plan Again

Our Results		
Food	First try	Second try
lettuce 	snails ate	snails ate
jelly beans 	snails did not eat	snails did not eat
carrots 	snails ate	snails ate

Draw a Conclusion

Snails do eat garden plants!



The children shared what they learned about snails with their classmates.

This can lead to new questions and investigations.



Think, Talk, and Write

1. Describe what the children did to find out what snails ate.
2. Write a question you have about snails.

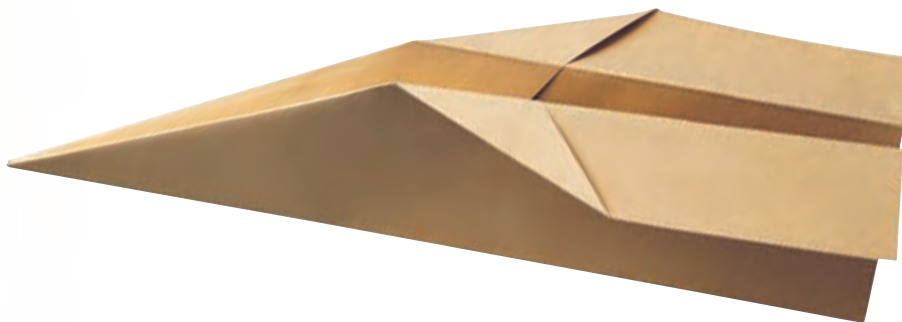
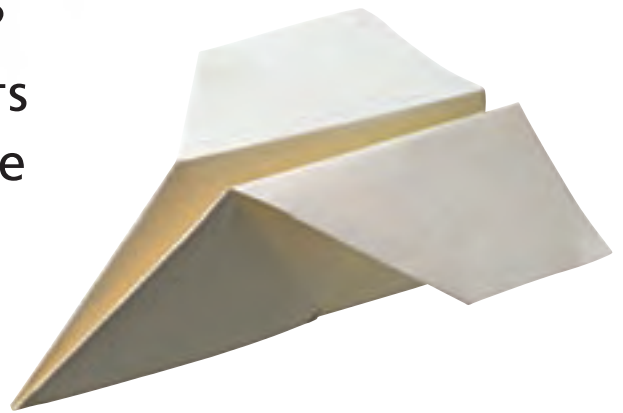


Science and Technology: **The Design Process**

Have you ever had a problem? How did you solve it? Scientists use the **design process** to solve problems.

► **Learn It**

When you use the design process, first you think of a problem. Next you come up with a solution. A solution is a way to fix a problem. You can get ideas from your friends, a teacher, or books. Then you design your solution. To design is to draw, plan, and build your idea.




► Try It

Ruthie's class is having a paper airplane contest. Ruthie made a plane for the contest. It flew 4 meters!

Design a paper airplane. Test your airplane. Make a chart to record how far your airplane flew.

- How is your airplane like Ruthie's?
- How far did your airplane fly?

	Ruthie's airplane	My airplane
		
Distance it flew (m)	4	



- Write about how you could change your airplane to make it fly farther.



ST-2. Explain that when trying to build something or get something to work better, it helps to follow directions and ask someone who has done it before.

Safety Tips

When you see  Be Careful, follow the safety rules.

Tell your teacher about accidents and spills right away.



Be careful with sharp objects and glass.



Wear goggles when you are told to.

Wash your hands after each activity.



Keep your workplace neat.
Clean up when you are done.



Ohio



Life Sciences

A photograph of two gray foxes sitting on the ground in a forest. The fox on the left is looking towards the camera, while the fox on the right is looking towards the left. They have thick, mottled fur in shades of gray, brown, and white. The background is filled with green foliage.

**Gray foxes are
common in Ohio.**



East Fork State Park



Northern Cardinals



a grassy prairie

Cool Cardinals

East Fork State Park in southern Ohio is home to many plants and animals. One type of bird that lives in the park is the Northern Cardinal. The cardinal is Ohio's state bird.

Living in the Forest

Cardinals live in Ohio year-round. Their strong beaks are good for cracking open seeds that have thick shells.

Male cardinals are bright red. Female cardinals are brown with some red. In spring, cardinals build nests in small trees. The adult cardinals feed insects to their babies.

Think, Talk, and Write

Critical Thinking How do cardinals look different from other birds you have seen?

LS-3. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry . . .

LS-4. Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.

Ohio

A CLOSER LOOK



Main Idea

Cardinals have special features and traits that help them survive in Ohio year-round.

Activity

Compare. Look at pictures of different birds.

- Draw each bird's beak.
- How might the birds' beaks help them eat certain types of food?



Scioto Trail State Park



the entrance
to the park



a bobcat

Room for Wildlife

Scioto Trail State Park is in southern Ohio. It is far from large cities, so many wild animals live there.

Bobcats and Bears

Two kinds of animals that live in Scioto Trail State Park are bobcats and bears. Bobcats have good eyesight and are very fast. They catch and eat mice and rabbits. Bobcats sleep in hollow logs and rock crevices.

Bears eat berries, meat, fish, and insects. They have a good sense of smell and can climb trees easily. Bears sleep in hollow logs, caves, and burrows.

Think, Talk, and Write

Critical Thinking Why do bears and bobcats live in forests but not cities?



LS-1. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter.

LS-4. Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.



Main Idea

Animals live in places where they can find food and shelter.

Activity

Observe. Look at a picture of a bear or a bobcat.

■ Draw a picture of what the animal likes to eat.

■ Explain how the animal finds the food it likes to eat.



CHAPTER 1

Plants Are Living Things

Lesson 1

Learning About Living Things 26

Lesson 2

Parts of Plants 34

Lesson 3

Different Plants 42

Lesson 4

Flowers, Fruits, and Seeds 50



What do you know about plants?

Key Vocabulary



living something that grows, changes, and needs food, air, and water to survive (page 28)



nonliving something that does not grow and change, or need food, air, or water to survive (page 29)



leaves plant parts that use sunlight and air to make food (page 38)



root plant part that keeps the plant in the ground (page 38)

More Vocabulary

nutrient, page 30

stem, page 38

trunk, page 45

flower, page 52

seed, page 52

fruit, page 53



LS-A. Discover that there are living things, non-living things, and pretend things, and describe the basic needs of living things (organisms). **LS-B.** Explain how organisms function and interact with their physical environment. **LS-C.** Describe similarities and differences that exist among individuals of the same kind of plants . . .



Lesson 1

Learning About Living Things

Look and Wonder

What living and nonliving things do you see here?

What is living and nonliving?

What to Do

- 1 Compare.** Look at a rock and a plant. Write about how they are alike and different.
- 2** Put the rock in a bin. Water the rock and the plant for a week.
- 3 Observe.** What happens?
- 4 Infer.** How do you know if something is living or nonliving?

Explore More

- 5 Classify.** Sort living and nonliving objects.

You need



rock



plant



water



clear bin

Step 2



Read Together and Learn

Vocabulary

living

nonliving

nutrient



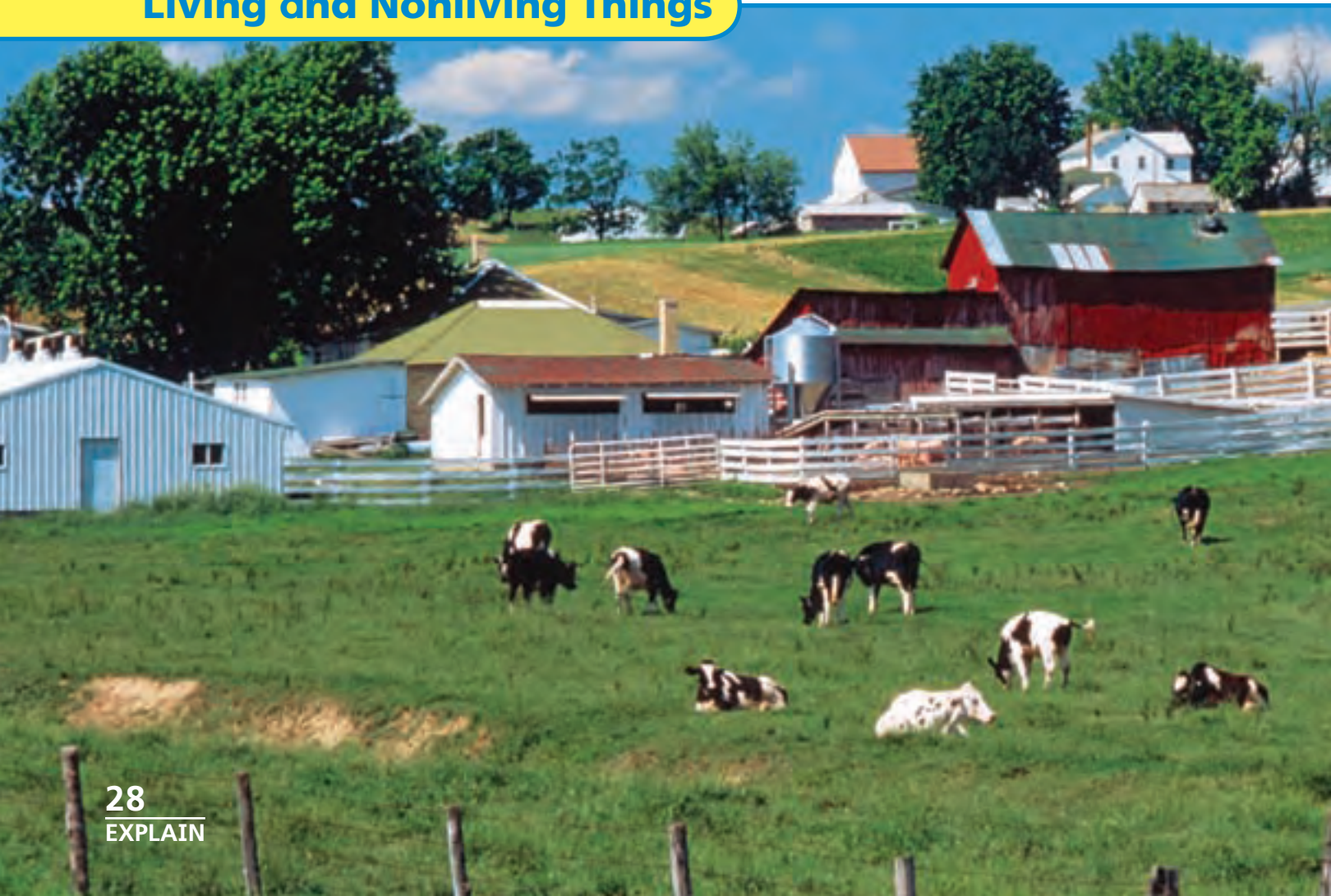
Explore the needs of plants with the Junior Rangers.

What are living and nonliving things?

You are a living thing. Plants and animals are, too. **Living** things grow and change.

Living things need food, water, and air to live. They make new living things like themselves.

Living and Nonliving Things



Nonliving things do not grow and change.

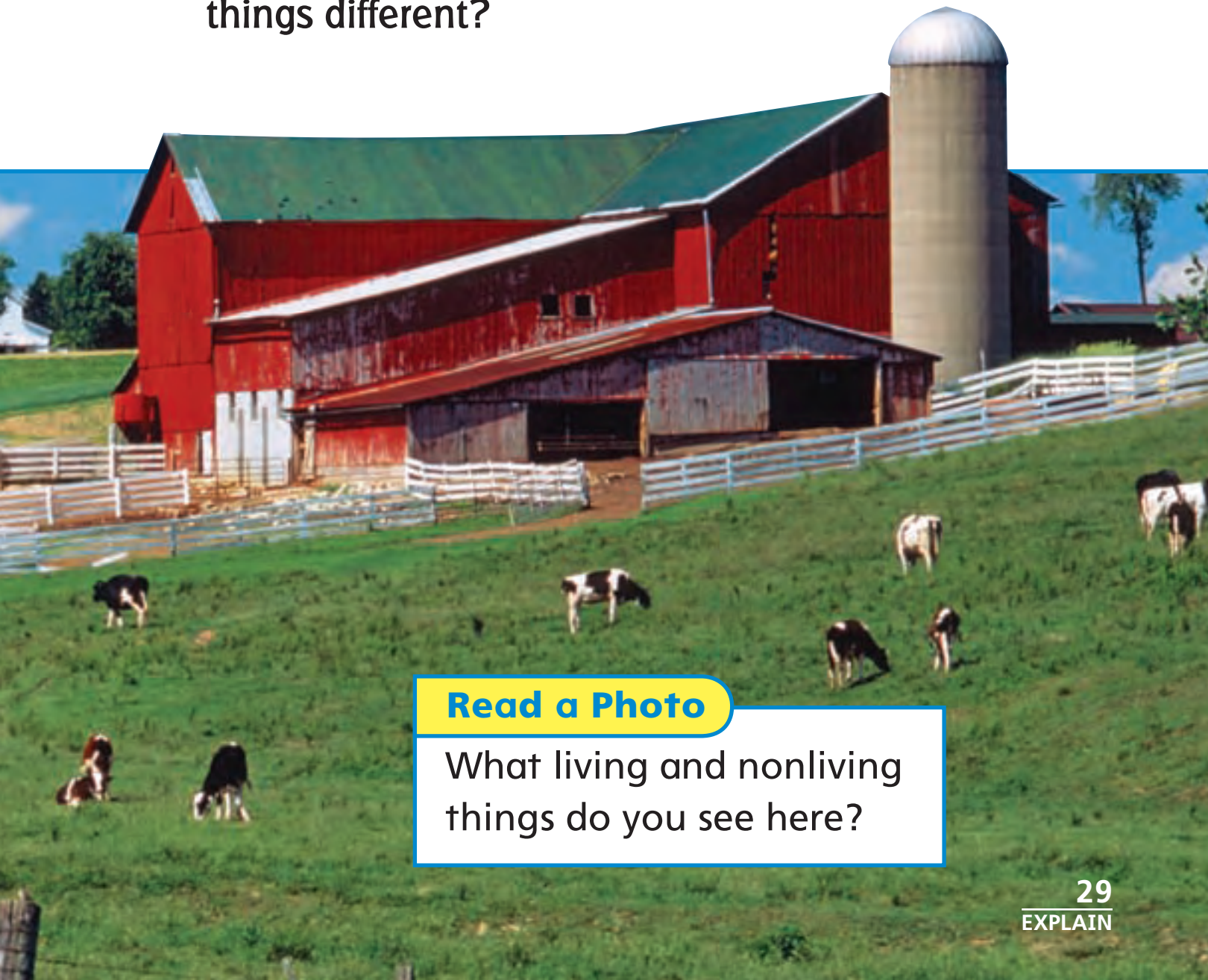
They do not need food, water, or air to survive. They do not make new things like themselves.

Quick Lab

Find living and nonliving things in your classroom.



✓ How are living and nonliving things different?



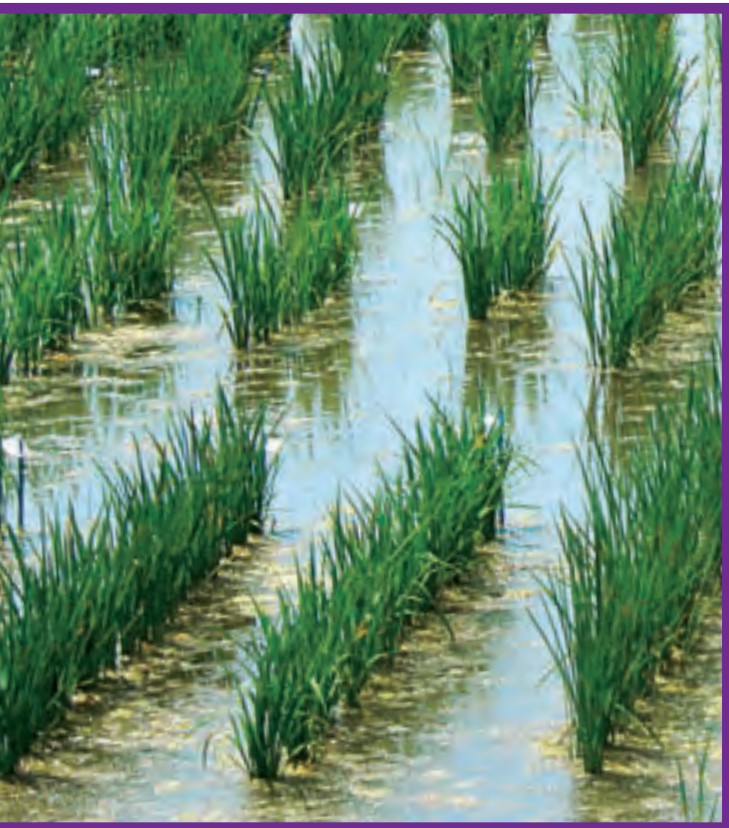
Read a Photo

What living and nonliving things do you see here?

Why are plants living things?

Plants need air, water, nutrients, sunlight, and space to live and grow. Just like food helps you grow, **nutrients** help plants grow.

Plants grow where they get what they need to survive.



▲ Rice plants need a lot of water to survive.



▲ Cactuses do not need a lot of water to survive.

FACT

A cactus plant can hold enough water inside it to last a whole year.

Plants use water, air, and sunlight to make their own food.

Plants grow and change. They make new plants like themselves.

Sunflowers need a lot of sunlight to live. ▶

✓ How are you different from plants?


Think, Talk, and Write

1. **Main Idea and Details.** Is a car living or nonliving? Why?

✎ 2. Write about what plants need to live.

Art Link

Draw a picture with living and nonliving things in it. Label your picture.

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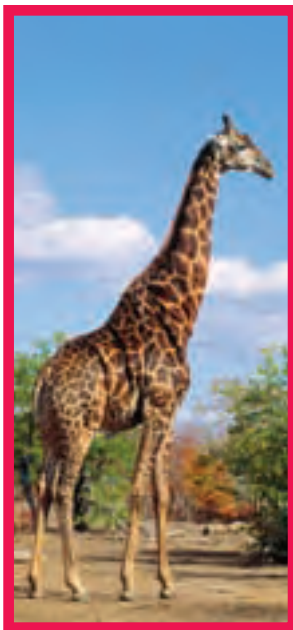
A GIANT GRASS

Did you know that bamboo is a kind of grass? It is very strong. Bamboo can be used to make many things.

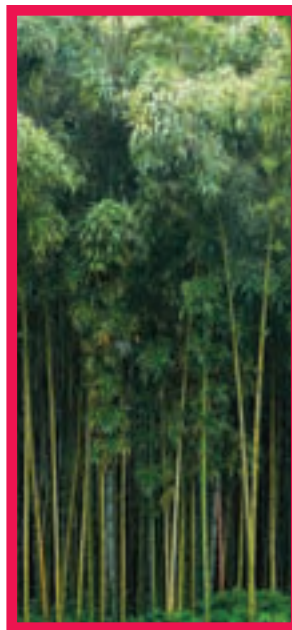
Sometimes people use bamboo to make floors and roofs for their homes. Bamboo can even be used to make sweet treats and drinks.



▲ People can climb on bamboo to fix buildings.



18 feet



25 feet

◀ Some bamboo plants can grow taller than a giraffe!

Talk About It

Summarize. What is bamboo?
What can it be used for?



ESS-1. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment and that resources are necessary to meet the needs and wants of a population. **ELA RA I.3.** Ask questions concerning essential elements of informational text (e.g., why, who, where, what, when and how).



Lesson 2

Parts of Plants

Look and Wonder

This tree is in Bryce Canyon in Utah.
Why does this tree not fall over?
What is holding it in place?



What are the parts of a plant?

What to Do

- 1 Gently pull a plant from the soil.
- 2 **Observe.** Use a hand lens to look at the plant's stems, leaves, and roots.
- 3 **Communicate.** Draw a picture of the plant and its parts.

Explore More

- 4 **Infer.** Why do you think the plant has different parts?

You need



plant



hand lens

Step 2



Read Together and Learn

Vocabulary

leaves

stem

root



Explore leaves, stems, and roots with the Junior Rangers.

What are the parts of plants?

Plants can not walk around like you. They have to get everything they need from the space around them.

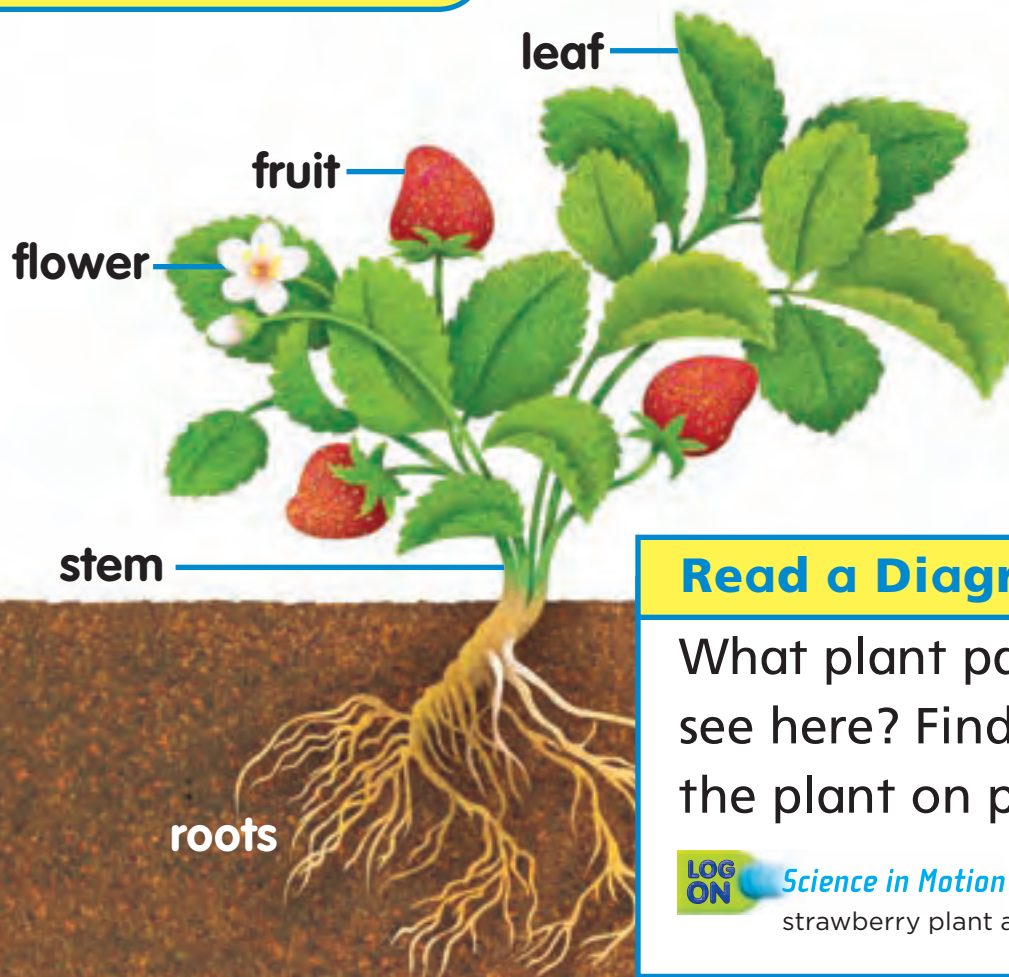


Plants have parts to help them get what they need. Most plants have leaves, stems, and roots.

These parts can look different on different kinds of plants.

✓ What are some parts of a plant?

Strawberry Plant



Read a Diagram

What plant parts do you see here? Find them on the plant on page 36.



Science in Motion See the parts of a strawberry plant at www.macmillanmh.com

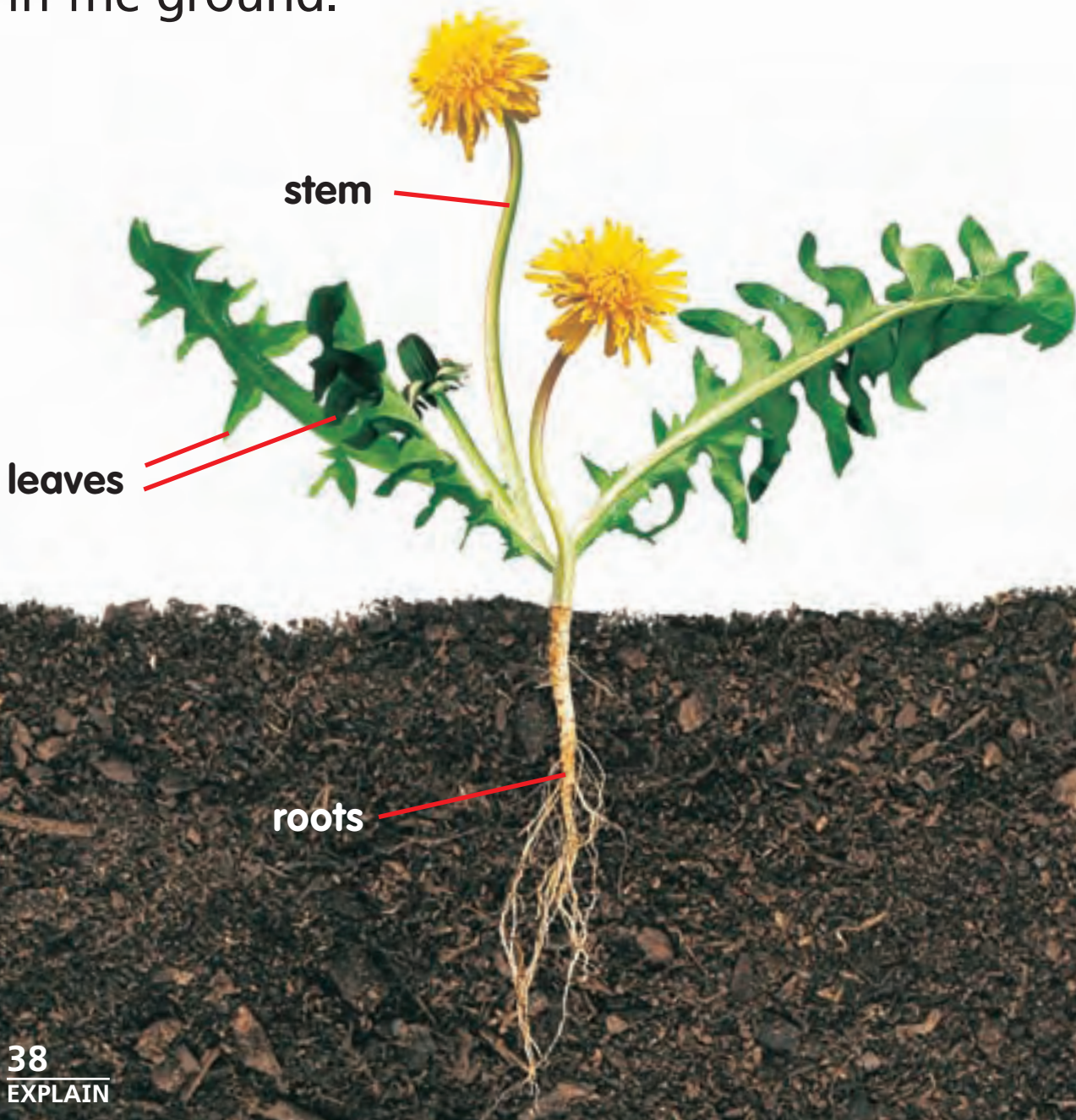
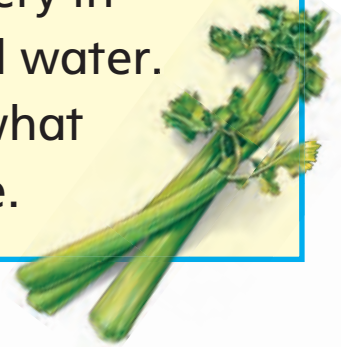
What do plant parts do?

Leaves use sunlight and air to make food. Food and water move through the stem to other plant parts.

The **stem** holds up the plant. **Roots** keep the plant in the ground.

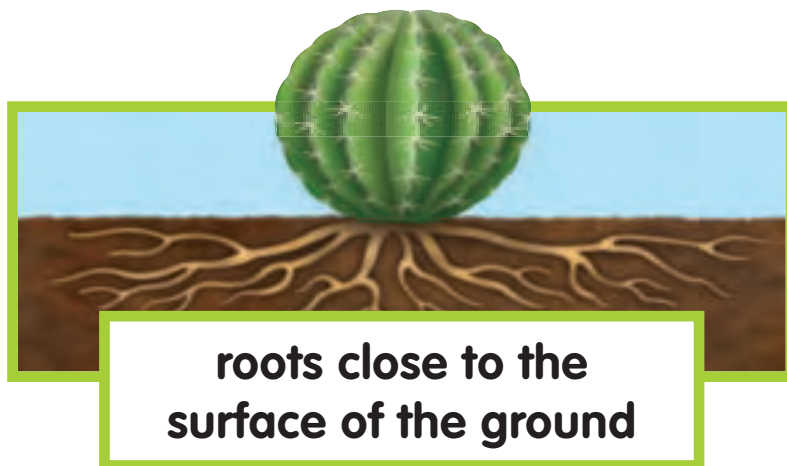
Quick Lab

Put celery in colored water. Draw what you see.



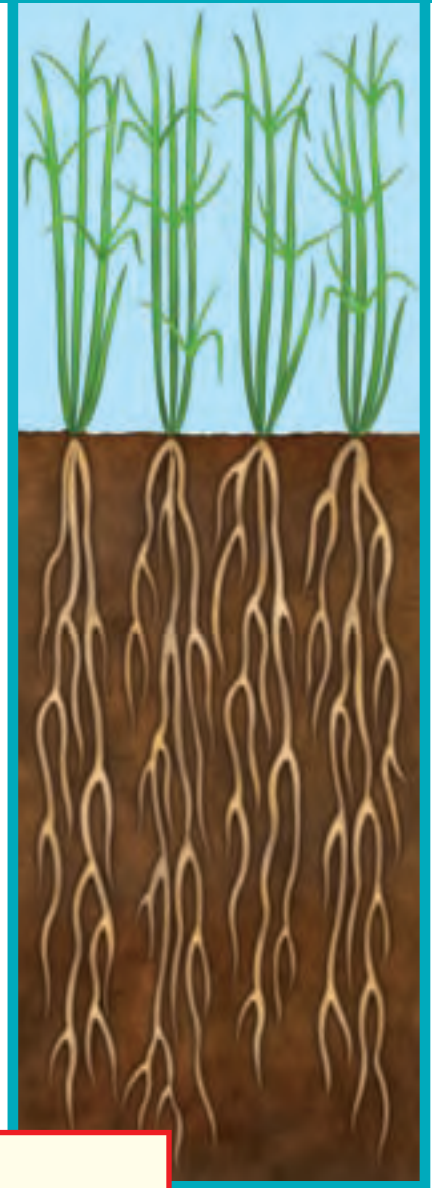
Plants have roots that take in water and nutrients from the soil.

Some plants have roots close to the surface of the ground. Others have long and deep roots.



✓ Why are roots important?

long and deep roots



Think, Talk, and Write

1. **Summarize.** Describe how each plant part helps a plant survive.
2. Write about why plants have leaves.

Math Link

Find two plants. Measure the length of their stems. Compare their sizes.



Meet General Sherman

A tree named General Sherman in California's Sequoia National Park is said to be the largest in the world.

It is 275 feet tall. That is as tall as a building with 27 floors!



Write About It

Write about a tall plant that you have seen. Draw it and label its parts.

Remember

Use words that describe the plant.



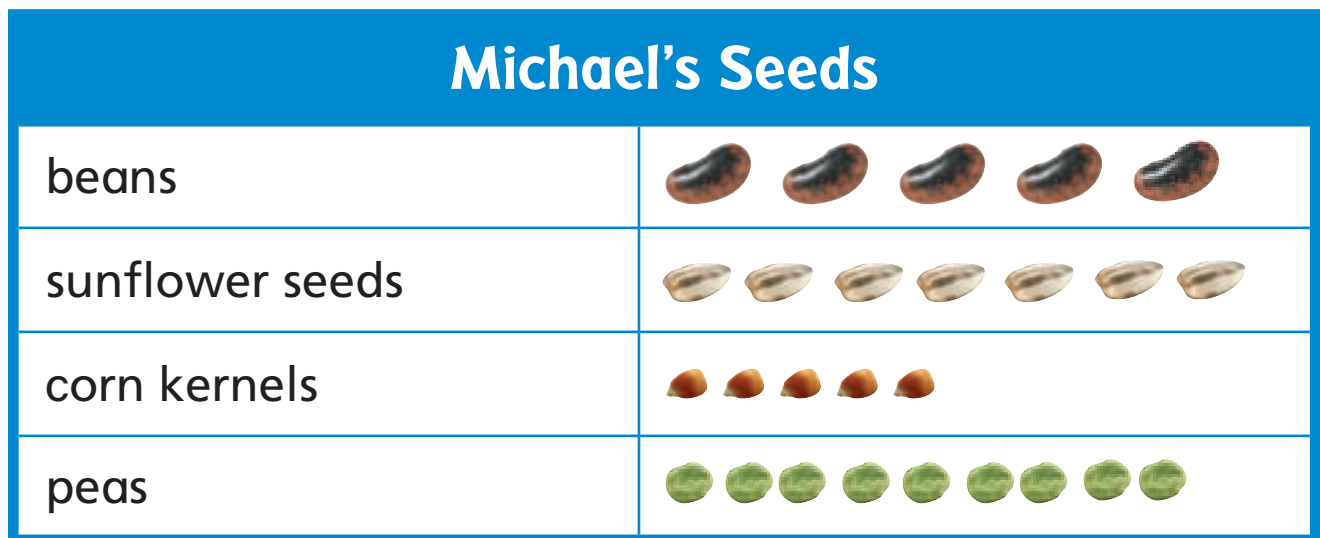
Write about it online at www.macmillanmh.com



SWK-2. Demonstrate good explanations based on evidence from investigations and observations. **ELA WA 1.2.** Write responses to stories that include simple judgments about the text.

Seeds of All Sorts

Michael sorted his seeds. He made a picture graph to show how many of each seed he has.



Read a Graph

Does Michael have more sunflower seeds or beans? Write a number sentence to show how you know.

If he found 6 more peas, how many would he have? Write a number sentence to show the answer.

Remember

A picture graph helps you solve a problem.



SWK-2. Demonstrate good explanations based on evidence from investigations and observations. **M DAP I.4.** Read and interpret charts, picture graphs and bar graphs as sources of information to identify main ideas, draw conclusions, and make predictions.




Lesson 3

Different Plants

Look and Wonder

There are many different kinds of plants. What kinds of plants do you see here?



LS-2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests). **LS-4.** Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.

How are plants different?

What to Do

- 1 Observe.** Find some plants around your school. How many different plants can you find?
- 2 Record Data.** Draw two different plants that you find.
- 3 Compare.** How are the plants alike? How are they different?

Explore More

- 4 Communicate.** How could you find out more about the plants you saw?

You need



paper



crayons

Step 2



Read Together and Learn

Vocabulary

trunk

How are plants different?

Not all plants look the same. Some plants have colorful flowers. Other plants are only green.

Different plants can have different types of leaves.



morning glory



lily of the valley



gerbera daisy

Tall Trees

Stems can be thin or thick. The thick stem of a tree is called a **trunk**.

Some plants are tall. Other plants, like grass, spread out along the ground.

✓ How are these plants alike? How are they different?



Read a Photo

How do you know the trees are tall?

grass

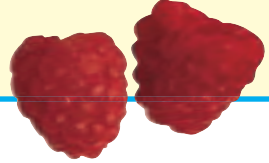
Which plant parts can you eat?

You can eat different plant parts. Some plant parts are safe to eat.

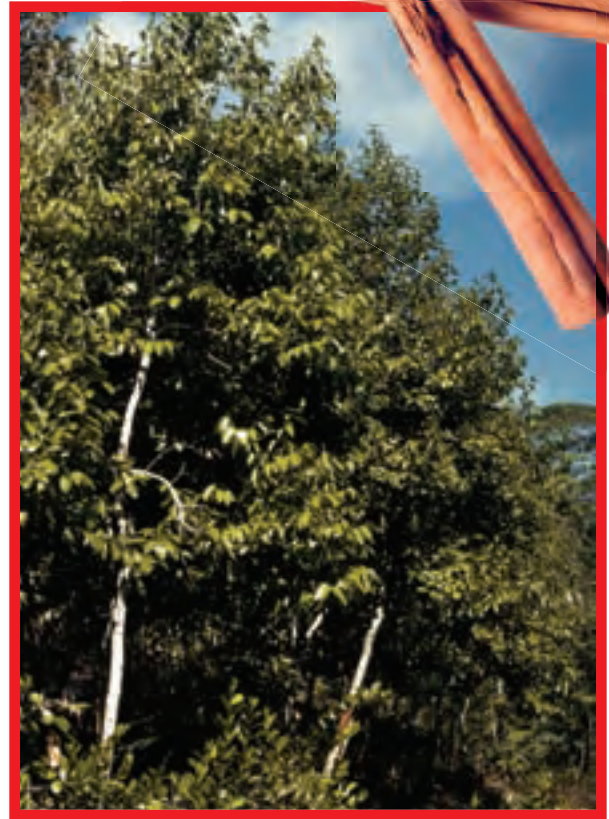
Others are not. Eating parts of some plants can make you sick.

Quick Lab

Find out which plant parts your classmates ate today.



- ▲ When you eat a coconut, you eat the seed of a plant.



- ▲ When you eat cinnamon, you eat a part of a tree trunk.

When you eat lettuce,
you eat the leaves
of a plant. ▼



When you eat a
carrot, you eat the
root of a plant. ▼




✓ What plant parts
do you eat?

Think, Talk, and Write

1. **Classify.** How are plants different?
2. Write about the plant parts that you ate today.

Art Link

Make a collage with different plant parts.

LOG ON  -Review Summaries and quizzes online at www.macmillanmh.com

Your Own Garden

Some gardens are big. Some are small.
People can grow food to eat
in their gardens.



Write About It

Write about a garden that you would like to have.

What plants grow in your garden? Are there plants that you could eat in your garden?

Remember

Use words that tell what your garden would look like.

LOG ON e-Journal Write about it online at www.macmillanmh.com



LS-2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests). **ELA WA I.I.** Write simple stories with a beginning, middle and end that include descriptive words and details.

Fruit for Sale

Jasmine wanted to buy some fruit at the market. She had these coins.



Count the Coins

Can Jasmine buy an apple?

Can Jasmine buy a lemon and a lime?

How do you know?

Remember

A quarter is worth 25 cents.

A dime is worth 10 cents.



SI-8. Use oral, written and pictorial representation to communicate work.

M NS I.7. Determine the value of a small collection of coins (with a total value of up to one dollar) using 1 or 2 different type coins, including pennies, nickels, dimes and quarters.

Lesson 4

Flowers, Fruits, and Seeds

Look and Wonder

You can see the flower and fruit of this plant. Where do you think this plant's seeds are?



LS-2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests). **LS-4.** Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.

How can you classify seeds?

What to Do

- 1 Observe.** Look at seeds with a hand lens.
- 2 Classify.** Sort the seeds into groups. How did you sort the seeds?
- 3 Record Data.** Make a chart to show how you sorted the seeds. Glue your seed groups onto the chart.

Explore More

- 4 Compare.** Which group has the most seeds? Which group has the fewest seeds?

You need



seeds



hand lens



glue

Step 3



SI-6. Use appropriate tools and simple equipment/instruments to safely gather scientific data.

Read Together and Learn

Vocabulary

flower

seed

fruit



Explore flowers, fruits, and seeds with the Junior Rangers.

Why are flowers important?

Living things are made of parts. Plants have different parts. Some plants have colorful flowers.

A **flower** is a part of a plant that makes seeds. A **seed** is a part of a plant that can grow into a new plant.

peach trees



Seeds are protected by the fruit of some plants. A **fruit** is the plant part that grows around seeds.

Fruits can be juicy and good to eat. We eat the fruits of many plants. Sometimes we eat seeds, too.

▼ Flowers on peach trees will grow into fruit.



▼ The flowers are gone and peaches fill the tree.



◀ The fruit protects the seed inside.

✓ What other fruits do you eat?

What are the parts of a seed?

Seeds come in many different shapes and sizes.

Seeds need water, light, and a warm place to grow. Seeds have parts to help them grow.

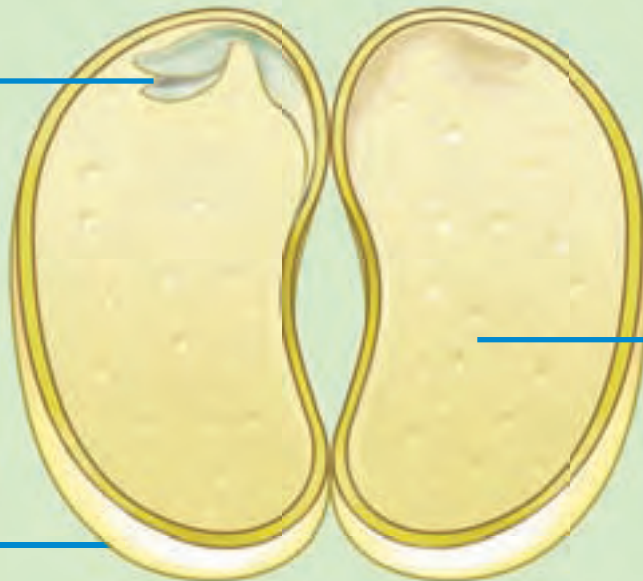
Quick Lab

Open a lima bean. Draw and label its parts.



Look Inside a Seed

This is a tiny plant inside a seed that will grow into a new plant.



This is food for the tiny plant.

Many seeds have an outer covering that keeps the seed safe.

Read a Diagram

What are the parts of this bean seed?

Seeds do not always grow in the same place. Wind can move seeds to a new place.

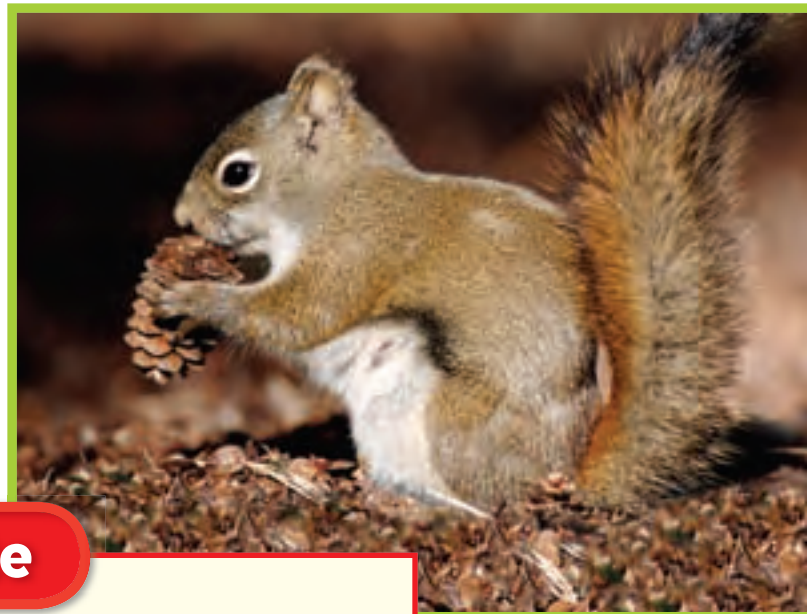
Animals can also move seeds. These seeds will grow plants in new places.



▲ Wind can carry maple seeds to new places to grow.

✓ What is inside a seed?

▶ Squirrels bury seeds. If they do not go back to eat the seeds, a new plant will grow there.




Think, Talk, and Write

1. **Summarize.** Why are flowers and fruits important to some plants?

2. Write about how seeds can move to different places.

Art Link

Use different seeds to make a collage.

LOG ON  -Review Summaries and quizzes online at www.macmillanmh.com











Focus on Skills

Inquiry Skill: **Classify**

When you **classify**, you group things by how they are alike.

► **Learn It**

Susan and her mom bought some peppers. When she got home she sorted them into groups. Susan made a chart to show how she classified her peppers.


yellow peppers	red peppers	green peppers
		
		
		
		



► Try It

Look at the fruit below.



1. How can you classify the fruit into different groups?
2. How many fruits do you have in each group?
3.  Make a chart like Susan's to show how you classified the fruit.



I Read to Review

My Plant Book



Some roots are thick.
Some roots are thin.

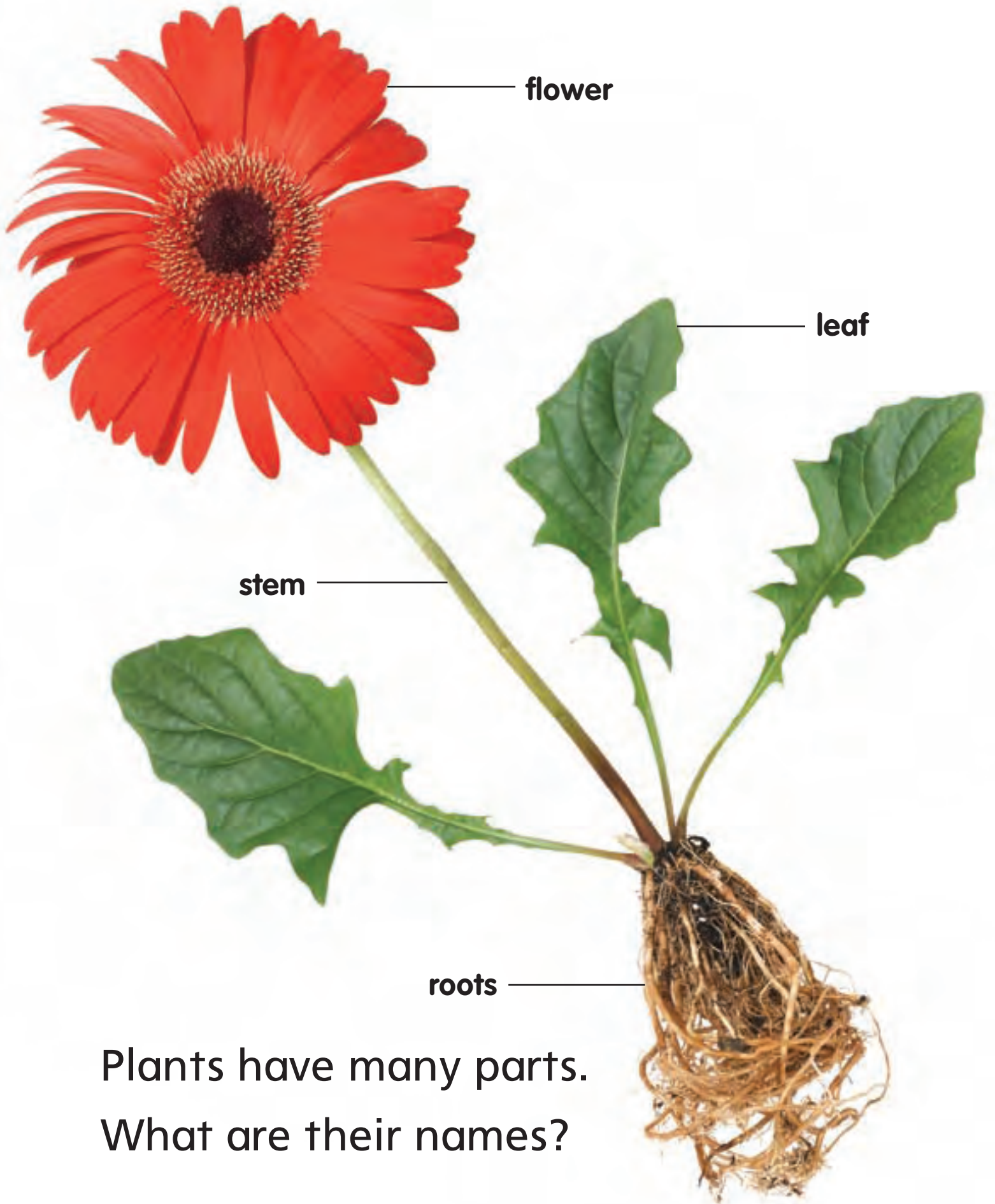




Some stems are thick.
Some stems are thin.



Some leaves are little.
Some leaves are big.



Plants have many parts.
What are their names?

CHAPTER 1 Review

Vocabulary

Use each word once to complete the sentences.

1. These are both _____.

LS-4



leaves

roots

stems

fruit

seeds

2. These are both _____.

LS-4



3. These are both _____.

LS-4



Answer the questions below.

4. Which is living and which is nonliving? Tell how you know.

LS-1



5. **Classify.** Sort the objects below into different groups.



6. **Main Idea and Details.** Name the parts of plants and what they do.

SI-9

7. What do you know about plants?

SWK-2



CHAPTER 2

All About Animals

Lesson 1

All Kinds
of Animals 66

Lesson 2

What Animals
Need to Live 76

Lesson 3

How Animals
Eat Food 84



What do you
know about
animals?



Key Vocabulary



mammal an animal with hair or fur
(page 68)



bird an animal that has two legs, two wings, and feathers
(page 69)



reptile an animal that has dry skin covered with scales
(page 70)



amphibian an animal that lives on land and in water (page 71)

More Vocabulary

fish, page 72

insect, page 73

shelter, page 79

gills, page 81

lungs, page 81

herbivore, page 87

carnivore, page 88



LS-A. Discover that there are living things, non-living things, and pretend things, and describe the basic needs of living things (organisms).

LS-B. Explain how organisms function and interact with their physical environment.

Lesson 1

All Kinds of Animals

Look and Wonder

Are all animals like these puppies? Why or why not?



What are some different kinds of animals?

What to Do

1 Cut out pictures of different animals.

⚠ Be Careful. Remember, scissors can be sharp!



2 **Classify.** Sort the pictures of animals into groups.

Explore More

3 **Compare.** Are your groups the same or different from those of your classmates? What other animals could you put in each group? Why?

You need



magazines



scissors



SI-5. Create individual conclusions about group findings.

SI-8. Use oral, written and pictorial representation to communicate work.

Read Together and Learn

Vocabulary

mammal

bird

reptile

amphibian

fish

insect

What are some types of animals?

There are many different kinds of animals. **Mammals** are a group of animals with hair or fur. They can hop, walk, swim, or fly.



▲ **Porcupines**
are mammals.

◀ **Mammals, like giraffes,**
take care of and give
birth to live young.

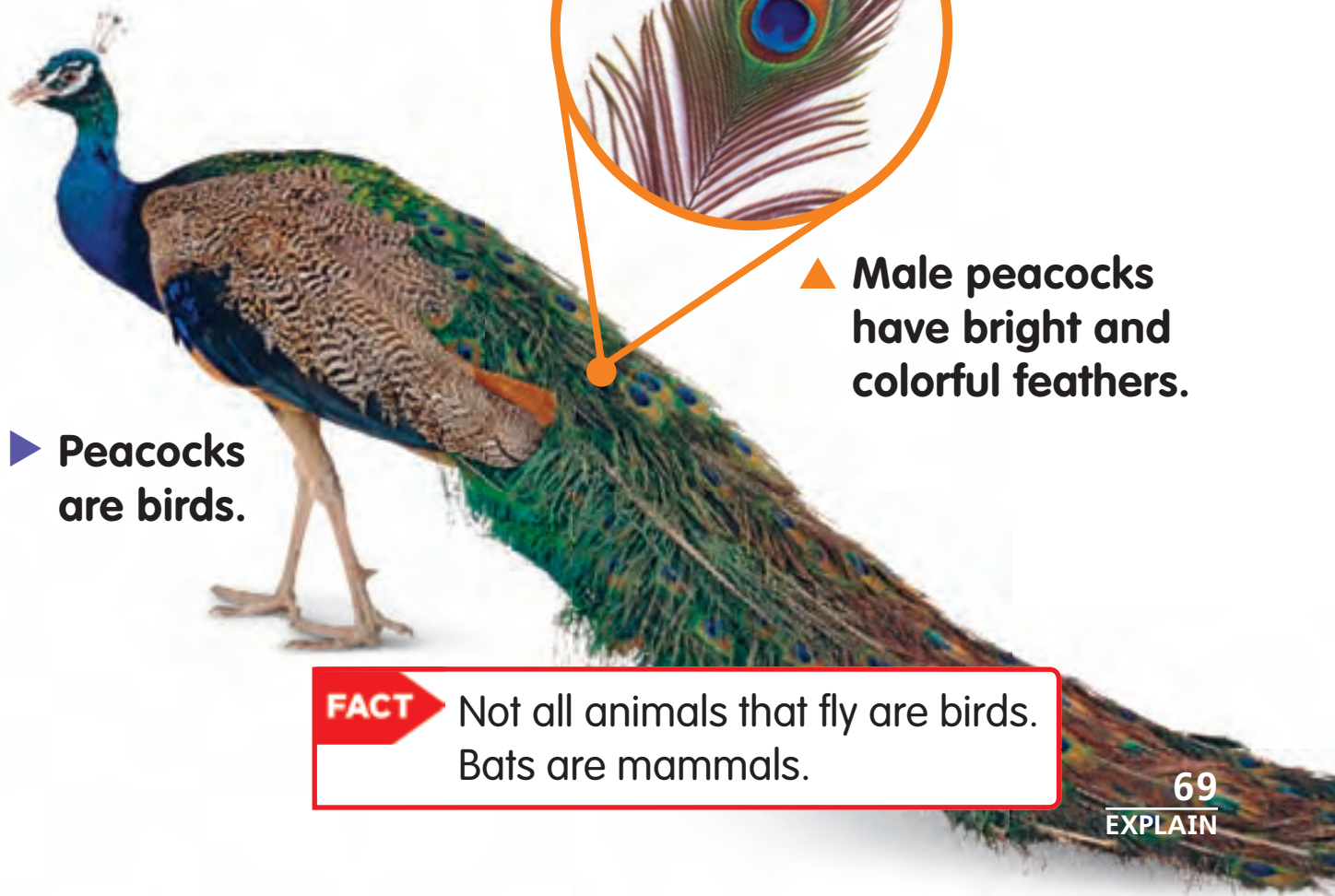
Birds are a group of animals that have feathers. They have two legs and two wings. Many lay eggs.

Most birds can fly. Birds also have beaks to help them eat food and carry things to their nests.



▲ Ducks are birds. They lay eggs in nests.

✓ How are mammals and birds different?



▶ Peacocks are birds.

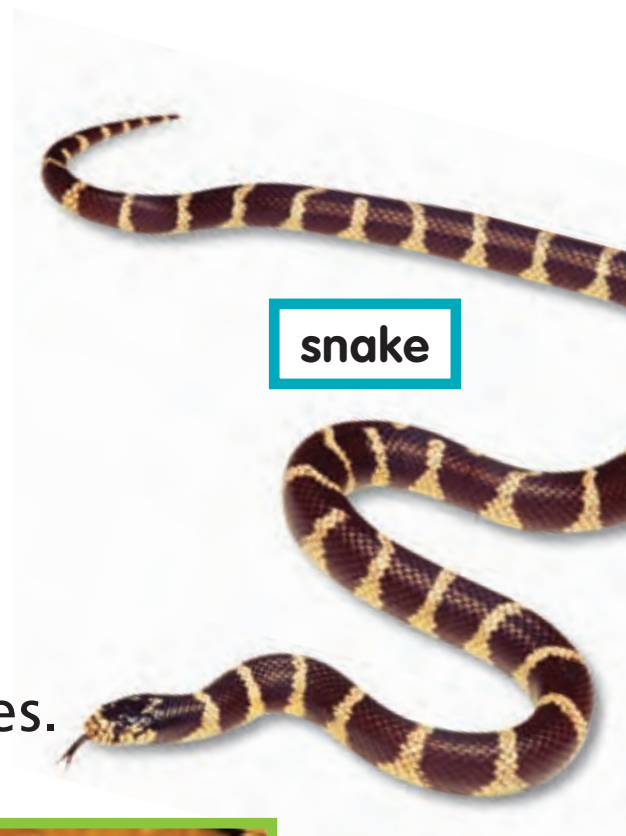
▲ Male peacocks have bright and colorful feathers.

FACT Not all animals that fly are birds. Bats are mammals.

What are reptiles and amphibians?

Reptiles are a group of animals that have dry skin covered with scales. Some reptiles also have shells to keep them safe.

Most reptiles lay eggs. Snakes, turtles, and alligators are reptiles.




snake



turtle



alligator



Amphibians are a group of animals that live on land and in water. Most amphibians have smooth, damp skin.

Amphibians usually hatch from eggs in water. Then they move to land when they are adults. Salamanders and frogs are amphibians.

✓ Can you name some reptiles and amphibians?



salamander

Quick Lab

Describe an animal.
Have a partner
guess the animal.



frog



What are some other types of animals?

Fish are a group of animals that live under water. Most fish have scales.

Fish have fins that help them swim. Fish also have gills that help them breathe.

Parts of a Fish



school of fish

Read a Diagram

Why do fish have fins?

LOG
ON

Science in Motion Watch how fish move and breathe at www.macmillanmh.com

Insects are animals that have three body parts and six legs. Most insects lay eggs.

Ants and butterflies are both insects. Spiders are not insects. They have eight legs.

spider



✓ How do you know an ant is an insect?

ant



Think, Talk, and Write

1. Compare and Contrast.

Compare different animals.
How many legs do they have.



2. Write about why fish have fins.

Art Link

Use a hand lens to compare insects.
Draw what you see.



butterfly

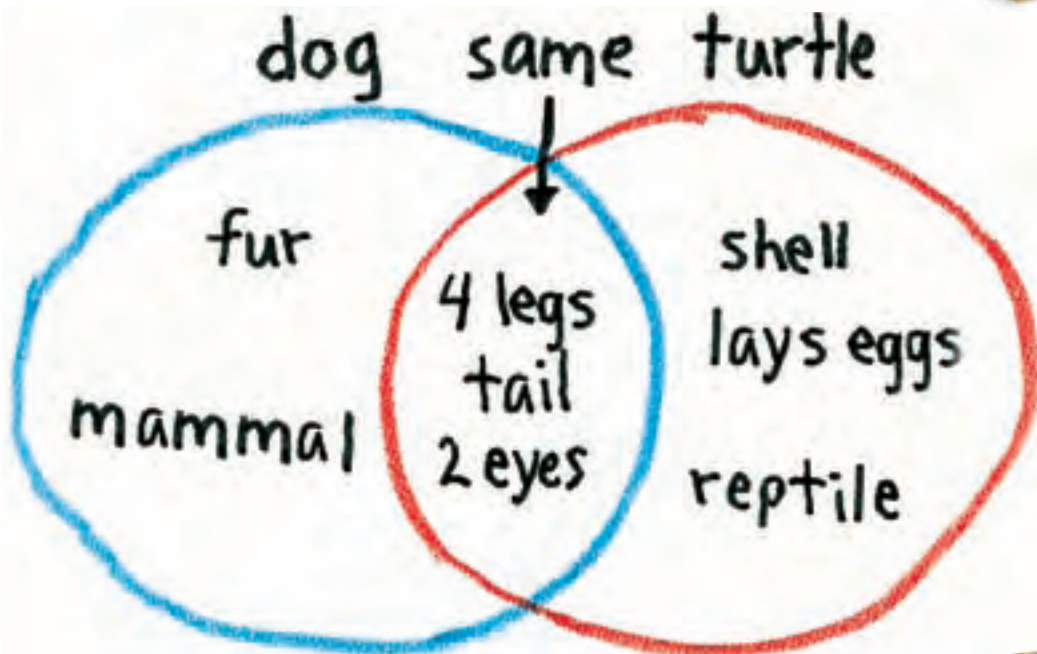
Focus on Skills

Inquiry Skill: **Compare**

When you **compare** two things, you look for ways they are the same and different.

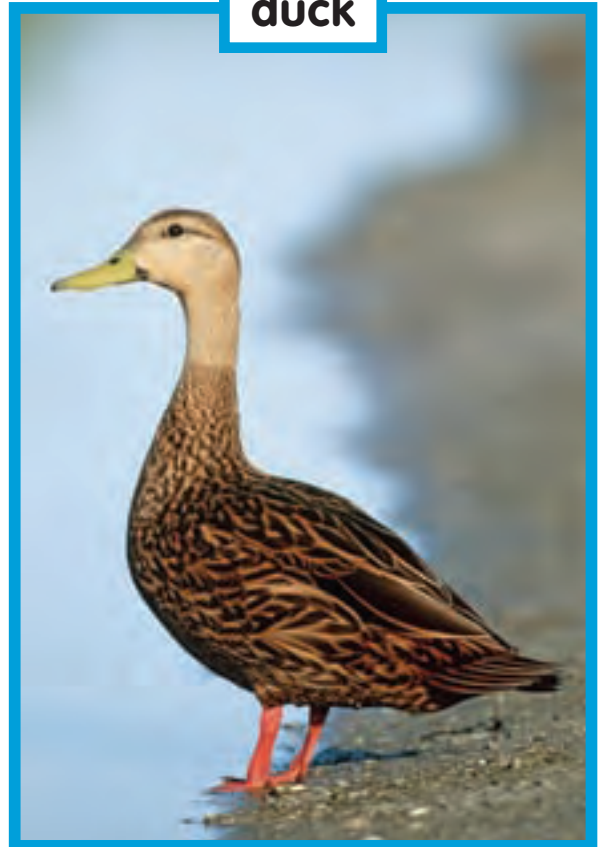
► **Learn It**


Ray compared a dog to a turtle. He made a Venn diagram to show how they are the same and different.



▶ Try It

Look at the pictures of the alligator and duck below.

alligator**duck**

1. How are they the same?
2. How are they different?
3.  Record what is the same and different in a Venn diagram.



SI-8. Use oral, written and pictorial representation to communicate work.

Lesson 2

What Animals Need to Live



Look and Wonder

What can you tell about this owl's home?



LS-1. Explore that organisms . . . have basic needs which include air, water, food, living space and shelter. **LS-3.** Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry . . . **LS-4.** Investigate that animals eat plants and/or other animals for food . . .

How do animals get what they need to live?

What to Do

- 1 Make a Model.** Put fish food, water, and crickets in a terrarium.
- 2 Observe.** Look at the crickets with a hand lens. How do they move? How do they get what they need to live?
- 3 Communicate.** Draw a picture of your terrarium.

Explore More

- 4 Compare.** Do all animals need the same things crickets need to live? How do you know?

You need



terrarium



water



fish food



crickets



hand lens

Step 3



Read Together and Learn

Vocabulary

shelter

gills

lungs



Explore what animals need with the Junior Rangers.

What do animals need to live?

Have you ever taken care of an animal? What did your animal need to live?

Animals are living things. Like you, they need food, water, air, and a safe place to live.

Zebras' Needs



Read a Photo

How are these zebras meeting their needs?

Animals live in different kinds of places. Some animals live on land. Others live in water.

A **shelter** is a place where animals can live and be safe.

✓ What do animals need to live?



▲ These raccoons find shelter in a log.



▲ This bear eats a plant for food.

How do animals meet their needs?

Animals have body parts to help them get what they need to live. Some use their eyes and noses to find food. Eyes, ears, and noses also tell animals of danger. Legs, wings, and fins can help them get away from danger.



▲ **Wings help birds fly to find food. Their beaks help them eat food.**

Strong legs help mountain lions move fast to get food. Sharp claws help them catch their food. ▼



FACT

Animals tell others where food is by moving their bodies, making sounds, or leaving smells.

Animals also have body parts that help them get air.

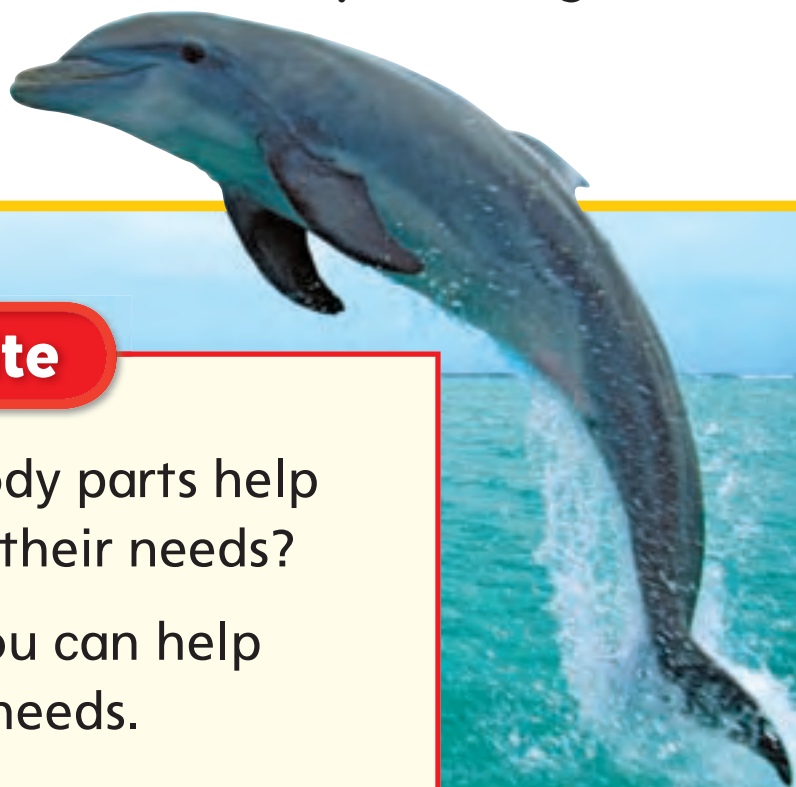
Gills help fish breathe in water. **Lungs** help other animals breathe air.

✓ Which body parts help animals get food and air?

Quick Lab

Investigate how different body parts help animals meet their needs.

▼ **Dolphins are mammals that live in the ocean. They have lungs.**



Think, Talk, and Write

1. **Classify.** How do body parts help birds and fish meet their needs?
2. Write about how you can help an animal meet its needs.

Health Link

How do you meet your needs?

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Animals' Needs

Esmeralda takes care of her cat. She makes sure it has what it needs to live.



Write a Story

Write about how Esmeralda cares for her cat. Tell how she helps her cat meet its needs.

Remember

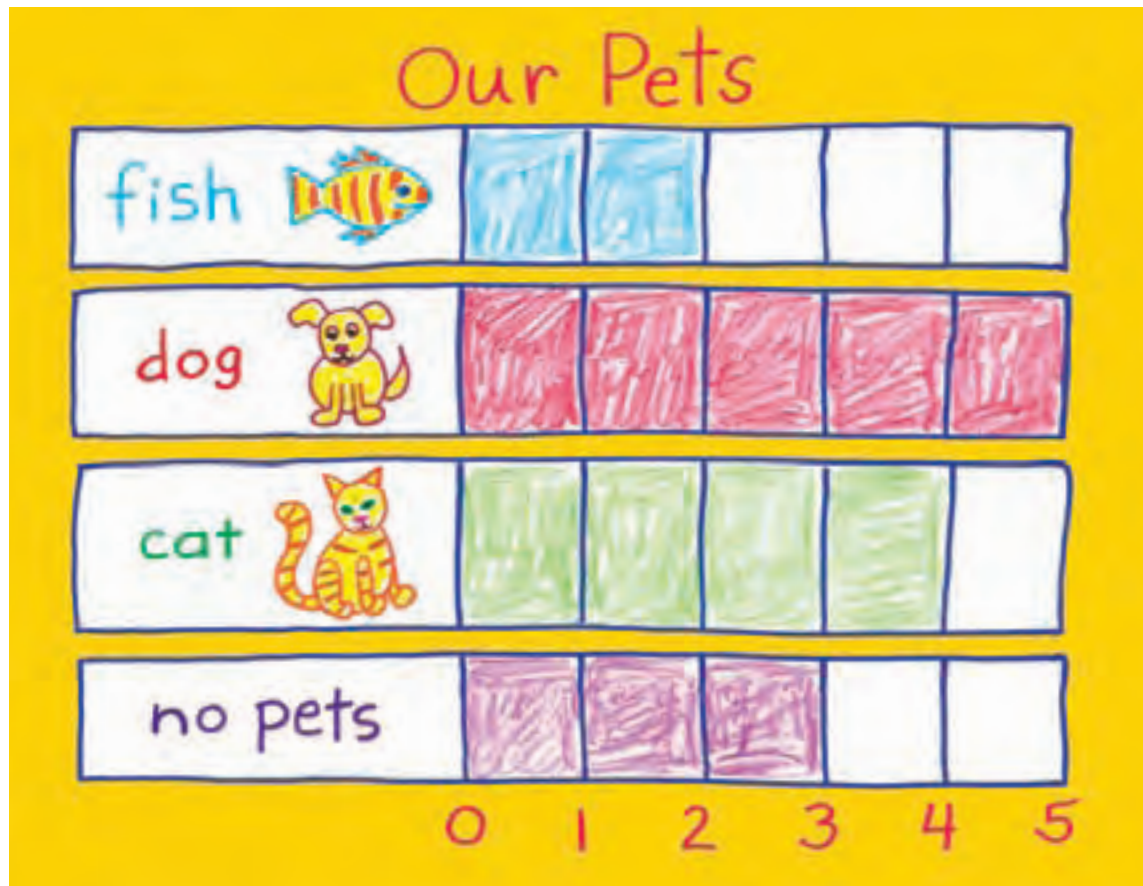
Tell what happens first, next, and last.

LOG ON e-Journal Write about it online at www.macmillanmh.com



Animal Graph

Tom made a bar graph to show what kinds of pets his friends have at home.



Make a Graph

Find out about your class's favorite pets. Make a bar graph to show which four pets your class likes best.

Remember

A bar graph helps organize information.



SI-5. Create individual conclusions about group findings. **M DAP I.3.** Display data in picture graphs with units of 1 and bar graphs with intervals of 1.

Lesson 3

How Animals Eat Food

Look and Wonder

What kinds of food does this goat eat? What helps it eat its food?



LS-3. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry . . . **LS-4.** Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.

How do teeth help you eat different foods?

What to Do

- 1 Observe.** Try each type of food. Use a mirror to see which teeth you use.
⚠ Be Careful. Check with your teacher before eating any food!
- 2 Record Data.** Draw and write about the teeth you used.
- 3 Compare.** Look at the shape of your teeth. Why are they different?

Explore More

- 4 Predict.** Which teeth would you use to bite a piece of meat? Why?

You need



carrots



dried fruit



popcorn



mirror

Step 1



Read Together and Learn

Vocabulary

herbivore

carnivore

Which animals eat plants?

Animals eat food to get the energy they need to live.

Different animals eat different things. Some animals are herbivores.



horse

A **herbivore** is an animal that only eats plants. Horses and rabbits are both herbivores.



✓ How do the flat teeth of a herbivore help it eat?

▲ Herbivores have flat teeth to chew and grind plants.



rabbit

Which animals eat meat?

Some animals are carnivores. A **carnivore** is an animal that eats only other animals.

Teeth



Read a Photo

How do these teeth help a carnivore eat?

tiger



Some carnivores have sharp claws to catch and hold their food. ▼

Carnivores have sharp teeth to rip and tear meat. Tigers and sharks are both carnivores.

Quick Lab

Compare what foods first graders like to eat.

- ✓ How do sharp claws help some carnivores eat food?



shark

Think, Talk, and Write

1. **Put Things in Order.** Describe how a tiger first gets, then eats its food.
2. Write about and draw an animal that eats only plants.

Health Link

Why do you have to take care of your teeth?

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You need



animal cards



clay



pattern
blocks

What do animals eat?

Find out what kinds of food different animals eat.

What to Do

- 1 Compare.** Look at the pictures below. How are the animals alike? How are they different?



- 2 Infer.** What kind of food does the animal in each picture eat? How do you know?

- 3 Make a Model.** Use clay and blocks to make a model of a carnivore's teeth and a herbivore's teeth.



- 4 Communicate.** Explain to a classmate what type of teeth each animal has and why.

Investigate More

Observe. Visit a pet store or nature center. How do the animals eat their food?



SI-4. Work in a small group to complete an investigation and then share findings with others. **SI-9.** Describe things as accurately as possible . . .

I Read to Review

My Animal Book



Do you have a pet
that needs your care?
Animals need food,
water, and air.





Do you know what
animals like to eat?
Some like plants.
Some like meat.



Do you like snakes?

They have scales.

Do you like birds?

They have feathers for tails.





Do you like horses?
They like to run.
Do you like lizards?
They lie in the Sun.

CHAPTER 2 Review

Vocabulary

What does each picture show?



amphibian

bird

fish

insect

mammals

reptile

Answer the questions below.

7. How are the teeth of a carnivore different from the teeth of a herbivore?

LS-3

8. **Compare.** What body parts do different animals use to meet their needs?

LS-3

9. **Compare and Contrast.** Look at a bird and a butterfly. How are they alike? How are they different?



10. Tell what living things need to live.

LS-1



11. What do you know about animals?

LS-A, LS-B



Literature

Poem



Giraffes

by Mary Ann Hoberman

Giraffes

I like them.

Ask me why.

Because they hold their heads up high.

Because their necks stretch to the sky.

Because they're quiet, calm, and shy.

Because they run so fast they fly.

Because their eyes are velvet brown.

Because their coats are spotted tan.

Because they eat the tops of trees.

Because their legs have knobby knees.

Because

Because

Because. That's why

I like giraffes.

Talk About It

Which words did the poet use to describe giraffes?

Careers in Science

Park Ranger

Do you want to work with plants? You could become a park ranger.

Some park rangers watch for forest fires. Some care for plants and animals living in a park. Some teach about the park and how to care for it.



park ranger

More Careers to Think About



botanist



marine biologist

LOG ON  e-Careers at www.macmillanmh.com



Ohio



Earth and Space Sciences

**This rock was
changed by nature.**

Raven Rock Arch, Scioto County, Ohio



Holden Arboretum



the butterfly garden

A Home for Plants

Holden Arboretum is in northern Ohio. It provides a home for many rare Ohio plants. Workers care for and protect the plants in the arboretum. Protecting plants is important for people and animals.

Plant Uses

Plants are resources that provide food, medicine, and homes for many animals. People use items that are made from plants, too. For example, wood, clothing fibers, and some fuels come from plants.

Think, Talk, and Write

Critical Thinking How do plants help people and animals?

ESS-1. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment . . .

Ohio

A CLOSER LOOK



Main Idea

Plants are important resources for people and animals.

Activity

Observe. Think of something that you use every day that comes from a plant.

- Draw a picture of the item.
- How does the item help you?





Alum Creek State Park



a gravel beach on Kelleys Island



the entrance to the park

Sand and Gravel Beaches


Alum Creek State Park, in central Ohio, has a 3,000-foot long sandy beach. Sand is made of small pieces of minerals and rocks. Some beaches are gravel. Kelleys Island, on Lake Erie, has many gravel beaches. Gravel is made of pieces of rock that are larger than those in sand.

Sand and Gravel Uses

Sand and gravel are natural resources. A natural resource can have many uses and is found in many places. Concrete is one important use of sand and gravel. Highways and sidewalks are made of concrete. Many buildings are also made of concrete.

Think, Talk, and Write

Critical Thinking Where else might sand and gravel come from?

 **ESS-I.** Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment . . .

Ohio

A CLOSER LOOK



Main Idea

Sand and gravel are natural resources.

Activity

Observe. Think of different uses for sand and gravel.

- Draw a picture of items made from concrete.
- How do these items help you?



CHAPTER 3

Looking at Earth

Lesson 1

What Earth

Looks Like 108

Lesson 2

Rocks and Soil 118

Lesson 3

Changing

the Land 126



What does Earth look like?

Key Vocabulary



river fresh water that moves
(page 113)



mountain land that is very high
(page 114)



valley low land between mountains
(page 114)



plain flat land that spreads out a long way
(page 115)

More Vocabulary

continent, page 110

mineral, page 121

soil, page 122

weathering,
page 128

erosion, page 132



Lesson 1

What Earth Looks Like

Moorea Island

Look and Wonder

An island is land surrounded by water. What does the land look like here?



Explore

Inquiry Activity

What can an island look like?

What to Do

- 1 Make a Model.** Use clay to make an island in a clear bin. Add water.
▲ Be Careful. Remember to wash your hands!
- 2 Observe.** Describe the land on your island. Is the land flat or high?

Explore More

- 3 Communicate.** Write about the plants and animals that might live on or around your island.

You need



modeling clay



clear bin

Step 1



SI-3. Use appropriate safety procedures . . . **SI-8.** Use oral, written and pictorial representation to communicate work.

Read Together and Learn

Vocabulary

continent

river

mountain

valley

plain

What is on the surface of Earth?

Earth is made up of land and water.

Land is the solid parts of Earth. There are seven large pieces of land on Earth. They are called **continents**.



land

water

Water surrounds the continents.
Water covers most of Earth.

Earth



Read a Photo

Where is the water
on this photo of Earth?

✓ What makes up Earth's surface?

What is Earth's water like?

Not all water on Earth is the same. Most water on Earth is in salty oceans.

Many living things can not drink salt water. They need fresh water to survive.

Quick Lab

Draw the water in your area.



▼ An ocean is a very large body of salt water.



Fresh water is water without salt. Streams, rivers, and lakes can be made up of fresh water. Streams flow downhill into rivers. **Rivers** may flow into lakes or oceans.

✓ What are some different types of water?



▲ A lake is water that has land all around.



▲ A river can move fast.

FACT Not all lakes are fresh water.

What is Earth's land like?

Not all land on Earth looks the same. Some land is high. Some land is low. Some land is flat.

A **mountain** is the highest type of land. Mountains come in all shapes and sizes. A **valley** is low land between mountains.



mountain

valley




plains

▲ **Plains** are flat land that spread out a long way.

✓ How are valleys and plains alike? How are they different?


Think, Talk, and Write

1. **Summarize.** What are some different kinds of land?

 2. Write about how lakes and rivers are different.

Art Link

Look at a map. Find oceans, lakes, and rivers. Then draw the water you see.

 **e-Review** Summaries and quizzes online at www.macmillanmh.com

Inquiry Skill: **Make a Model**

When you **make a model** you make something to show how it looks or works.

► **Learn It**

Juan wanted to find out how a river flows into a lake. He used clay and water to make a model. He saw how a river flows.



▶ Try It

Look at the picture below.



1. What kind of land is in this picture?
2. Make a model of the land.
3. Write about why people make models.



SWK-2. Demonstrate good explanations based on evidence from investigations and observations.

Lesson 2

Rocks and Soil

Look and Wonder

What do you observe about the rocks and soil in this picture?



How can you classify rocks?

What to Do

- 1 Observe.** Use a hand lens to look closely at some rocks.
- 2 Compare.** Do the rocks look or feel the same? How are they different?
- 3 Classify.** Sort the rocks into groups. Explain your groups to a classmate.

Explore More

- 4 Make a Model.** Use clay to make a model of a rock. Include as many details as you can.

You need



rocks



hand lens

Step 1



Read Together and Learn

Vocabulary

mineral

soil

What are rocks?

Rocks can have different shapes, sizes, and colors.

Some rocks are smooth.

Other rocks are rough.

Some are shiny.

Others are dull.

Rocks



quartz



granite



sandstone



marble

All rocks are made of minerals. A **mineral** is a nonliving thing from the earth.

Some rocks are made of many minerals. Others are made of only one mineral.

Quick Lab

Compare how hard different rocks are.



✓ How are all rocks the same?



chalk



pumice



limestone



obsidian

Read a Photo

How are these rocks alike and different?

FACT Not all rocks are hard.

What is soil?

Soil is the top layer of Earth. It is made up of tiny pieces of rocks. Dead plants and animals are also in soil. Water and air are, too.



- ◀ **Topsoil holds some water. It feels crumbly. Most plants grow well in topsoil.**



- ◀ **Clay soil holds a lot of water. It feels slippery. Many plants can not grow well in clay soil.**



- ◀ **Sandy soil holds a little water. It feels rough. Desert plants grow well in sandy soil.**

There are many different kinds of soil. Many soils are brown. Some are red, gray, or yellow.

Soils can have different plant, animal, or mineral parts in them.



✓ What is soil made of?


▲ Over time, this dead tree will become part of the soil.

Think, Talk, and Write

1. **Put Things in Order.** Take some rocks and put them in order from biggest to smallest.
2. Write about three different kinds of soil.

Social Studies Link

Collect some soil near school. Look at it with a hand lens and tell what you see.

LOG ON  e-Review Summaries and quizzes online at www.macmillanmh.com

Meet Rondi Davies

Rondi Davies is a geologist at the American Museum of Natural History. A geologist is a scientist who studies rocks. Rondi studies diamonds and how they were formed. Diamonds are made of carbon.



This is Rondi Davies.

A large pile of uncut diamonds, showing various shapes and sizes, some with facets and others more irregular. The diamonds are mostly clear and translucent, with some darker, more opaque ones mixed in. They are piled together, creating a dense, textured surface.

uncut diamonds

Heat and pressure deep inside Earth can change carbon into diamonds.

If hot carbon cools very quickly, a diamond is formed.

If hot carbon cools slowly, graphite is formed. That is the gray tip of your pencil!



This is a cut diamond.



▲ graphite

Talk About It

Put Things in Order. How can carbon become a diamond?

SWK-3. Explain that everybody can do science, invent things and have scientific ideas no matter where they live.

ELA RP 1.8. Answer literal, simple inferential and evaluative questions to demonstrate comprehension of grade-appropriate print texts and electronic and visual media.



Lesson 3

Changing the Land

Columbia Glacier

Look and Wonder

This part of Earth is very cold. What is happening to the ground in this picture?



ESS-3. Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks).

How can water break rock?

What to Do

- 1 Make a Model.** Fill a film canister all the way with water. Put the cap on.
- 2** Have your teacher place the canister in a freezer.
- 3 Predict.** What will happen to the water in the canister?
- 4 Observe.** Look at the canister after a few hours. What happened?

Explore More

- 5 Infer.** What do you think will happen if water freezes in a rock?

You need



film canister



water

Step 1



Read Together and Learn

Vocabulary

weathering

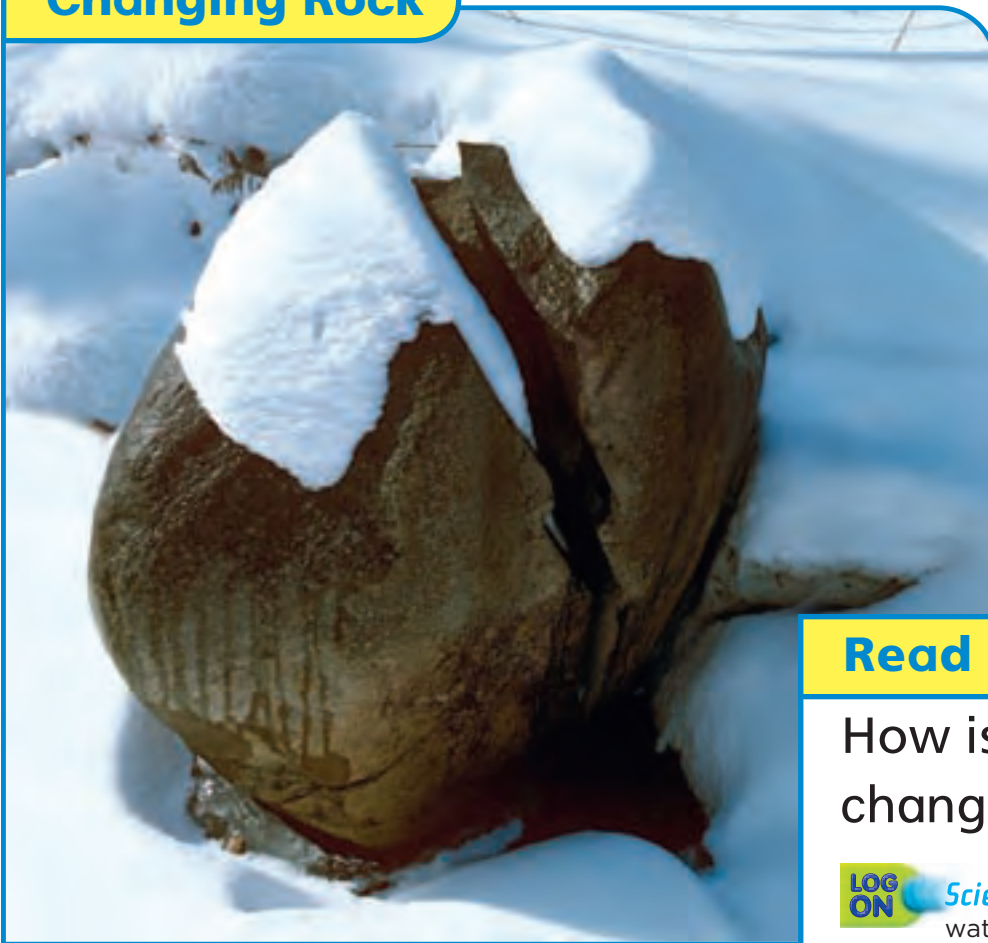
erosion

How can rocks change?

Did you know that water can change the shape and size of rocks? This is called **weathering**.

When water gets into cracks in a rock, it can freeze and push the rock. The cracks get bigger and the rock breaks.

Changing Rock



Read a Photo

How is water changing this rock?

LOG
ON

Science in Motion Watch
water changing rock
at www.macmillanmh.com

Plants can also break rocks. Some plants grow in the cracks of rocks.

Sometimes a plant's roots grow and push against the rock. The cracks slowly get bigger and the rock breaks.

✓ What can break a rock?



As this tree's roots grow, they crack the rock. ▼

FACT

Tree roots can grow under sidewalks and make them crack.

How do living things change Earth?

Animals can change Earth. Beavers chew on trees. Then the trees fall to the ground. Beavers use the trees to make homes in the water. These homes sometimes block a river or stream.



People can change Earth, too. Sometimes people cut down trees. Then they smooth out the land and build homes or buildings. People dig new lakes, ponds, and ditches. The lakes, ponds, and ditches hold water during heavy rains.

✓ What animals besides beavers cause changes to Earth?



How can land change?

Land can change quickly or slowly. Weathering and erosion slowly change the shape of land.

Erosion is when rock and soil are moved by wind or water to a new place.

Water can slowly wash away pieces of rock, making a canyon. ▼



canyon



Plants can help prevent erosion. A plant's roots help hold soil in place so wind and water can not move it.

✓ What is erosion?

Quick Lab

Pour water over sand. **Observe** erosion.



Think, Talk, and Write

1. **Compare and Contrast.** Describe two ways water can change rock.
2. Write about how erosion could be slowed down.

Social Studies Link

After a rainy day, look for signs of soil erosion near you. How can you tell?

LOG ON e-Review Summaries and quizzes online at www.macmillanmh.com

Stopping Erosion

Look at the picture below. What do you think could be eroding the soil?



Write a Story

Write a story about what could help stop erosion in this picture.



Write about it online at www.macmillanmh.com

Remember

A story has a clear beginning, middle, and end.



ELA WA I.2.2. Write responses to stories that include simple judgments about the text.

Adding Rocks

Peter sorted his rocks into two groups. Then he wrote a number sentence to show how many rocks he had all together.

$$4 + 6 = 10$$



Write a Number Sentence

Collect your own rocks. Sort them into groups. Write a number sentence to show how many rocks you have.

Remember

A number sentence helps you solve a problem.





I Read to Review

**My
Earth
Book**

Earth is made of land and water.
Where the ocean and land meet,
there is sometimes sand.



Ocean waves hit land.
Small pieces of rock break off.
Sand is made of tiny pieces of rock.



Earth has different kinds of land.
Mountains are high land.
Valleys are low land.



Earth has different kinds of water.
Lakes have land all around.
Some plants grow in the water.

CHAPTER 3 Review

Vocabulary

Use each word once to complete the sentences.

mountain

river

soil

1. This moving water that flows into a lake or ocean is a _____.

ESS-D



2. Small rocks and dead plants and animals go into the _____.

ESS-D



3. This kind of land is called a _____.

ESS-D



Answer the questions below.

4. What are rocks made of? How can rocks change?

ESS-3

5. **Make a Model.** How could you make a model of a kind of land?

SI-8

6. **Put Things in Order.** Put these rocks in order from smallest to biggest.

SI-7



7. What are some ways living and nonliving things can change Earth?

ESS-3



8. What does Earth look like?

SI-8

CHAPTER 4

Caring for Earth

Lesson 1

Earth's Resources ...144

Lesson 2

Using Earth's
Resources. 154

Lesson 3

Saving Earth's
Resources. 162



**Why do we need
to care for Earth?**

Key Vocabulary



pollution harmful things in the air, land, or water
(page 158)



reuse to use something again
(page 164)



reduce to use less of something (page 166)



recycle to make a new thing from an old thing (page 167)

More Vocabulary

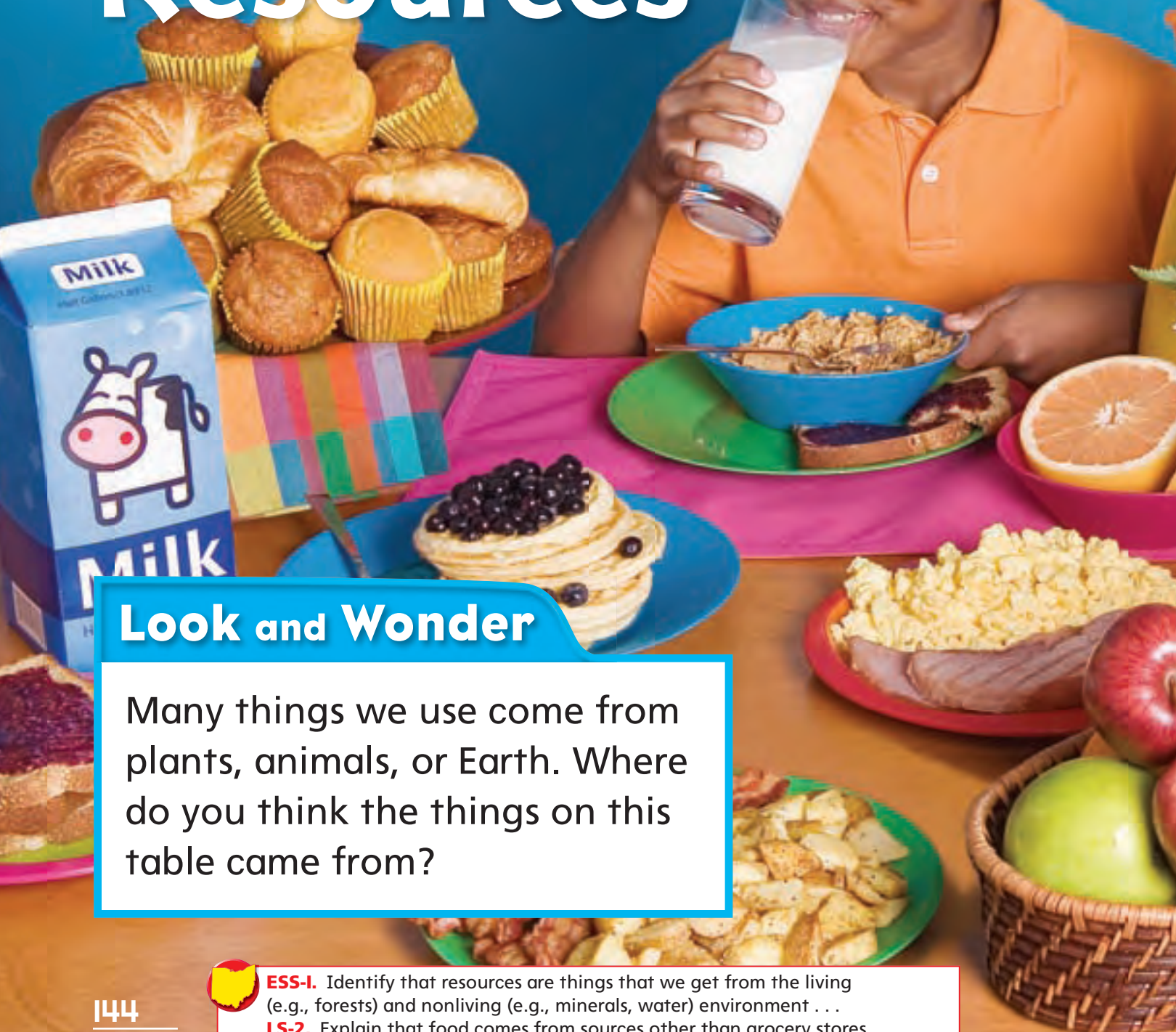
natural resource,
page 146

conserve, page 164



Lesson 1

Earth's Resources



Look and Wonder

Many things we use come from plants, animals, or Earth. Where do you think the things on this table came from?



ESS-1. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment . . .

LS-2. Explain that food comes from sources other than grocery stores . . .

What things are made from plants or animals?

What to Do

- 1 Write the words "Plant" and "Animal" on sticky notes.
- 2 **Classify.** Look around the classroom. Put the sticky notes on objects that are made from either plants or animals.
- 3 **Communicate.** Make a list of objects that can come from plants or animals.

Explore More

- 4 **Investigate.** Pick an object from your classroom or house. Make a plan to find out what it is made from.

You need



sticky notes

Step 2



SI-8. Use oral, written and pictorial representation to communicate work.

Read Together and Learn

Vocabulary

natural resource

What is a natural resource?

Things that come from Earth that people use are called **natural resources**.

We use living and nonliving resources every day. Animals, plants, rocks, soil, water, and air are some things we use.



◀ You can use wood from trees to build things.



People use natural resources in many different ways. We have to be careful not to use up all our natural resources.

✓ What natural resources do you use?



▲ You can use wool from animals to make clothes.



▲ You can use plants to make colorful dyes for many things.



You can use rocks to build walls, roads, and buildings.



Why is food a natural resource?

Much of the food we eat comes from living things. Forest trees and plants provide fruit, vegetables, and nuts. People use crops such as wheat to make bread and other products.



▲ Banana trees provide fruit.



▲ Chocolate comes from the seeds of the cacao plant.



Oceans, rivers, and lakes have food such as shrimp, crab, and fish. Some farm animals, such as cows and goats, provide milk. Hens give us eggs.

✓ What other kinds of foods come from living things?



Why is soil important?

Soil is a natural resource. It is very important for plants, people, and animals.

Plants grow in soil. People and animals can use these plants for food.

Quick Lab

Find out about an animal that uses soil for its home. Write about it.



Earth's Resources



Read a Photo


What resources can you see here?



Science in Motion Watch how we use resources at www.macmillanmh.com

Soil can also be used to make things.

Clay is a kind of soil. Potters use clay to make objects such as cups.


 How do living things use soil?



clay cup


Think, Talk, and Write

1. **Predict.** What plants do you think you will eat tomorrow?

 2. Write a list of natural resources.

Music Link*

Make up a song about things that grow in soil. Use the tune of "Old MacDonald Had a Farm."

 **e-Review** Summaries and quizzes online at www.macmillanmh.com

Focus on Skills

Inquiry Skill: **Investigate**

When you **investigate**, you make a plan and try it out.

► **Learn It**

Amy wants to plant a garden. She needs to know about the soil in her yard. She wonders how much water the soil will hold.



Amy's Plan



1. Dig up soil from the garden.
2. Put $\frac{1}{2}$ cup of soil into a coffee filter.
3. Put coffee filter into a strainer on top of a bowl.
4. Pour 1 cup of water onto the soil.
5. Wait 2 minutes and measure how much water is in the bowl.
6. Try to tell how much water is in the soil.

▶ Try It

1. Use Amy's plan to find out how much water two kinds of soil will hold.

▲ Be Careful. Remember to wash your hands.



2. How much water passes through each kind of soil?
3. Write and draw about what you find out.

You need



cup of water



two kinds of soil



coffee filter



strainer



clear bowl



SI-8. Use oral, written and pictorial representation to communicate work.

Lesson 2

Using Earth's Resources

Look and Wonder

Water and air are important resources. Why is water important to this fireboat?



When do you use water every day?

What to Do

- 1 Investigate.** Find out ways you use water.
- 2** Make a class chart showing the different ways you all use water throughout the day.
- 3 Record Data.** Use tally marks to record how many times water was used for each activity.

Explore More

- 4 Infer.** Are there times when you could use less water?

You need





paper



crayons

Step 3

When Did We Use Water Today?	
 wash hands	
 brush teeth	
 drink water	



Read Together and Learn

Vocabulary

pollution

Why are water and air important?

All living things need water and air to live.

Plants need water to grow. We use water to wash and play. We also use it to cook and drink. People and animals need air to breathe.

Using Water



When water and air are not clean, we can not use them.

People need to keep water and air clean so all living things can use them.

✓ Why is water important to living things?



Read a Photo

How do people use water?

What is pollution?

Pollution is when there are harmful things in the land, water, or air.

Pollution happens when trash or dirt gets into the ground, water, or air.

- ▼ When people pollute water and land, it can hurt animals.

Quick Lab

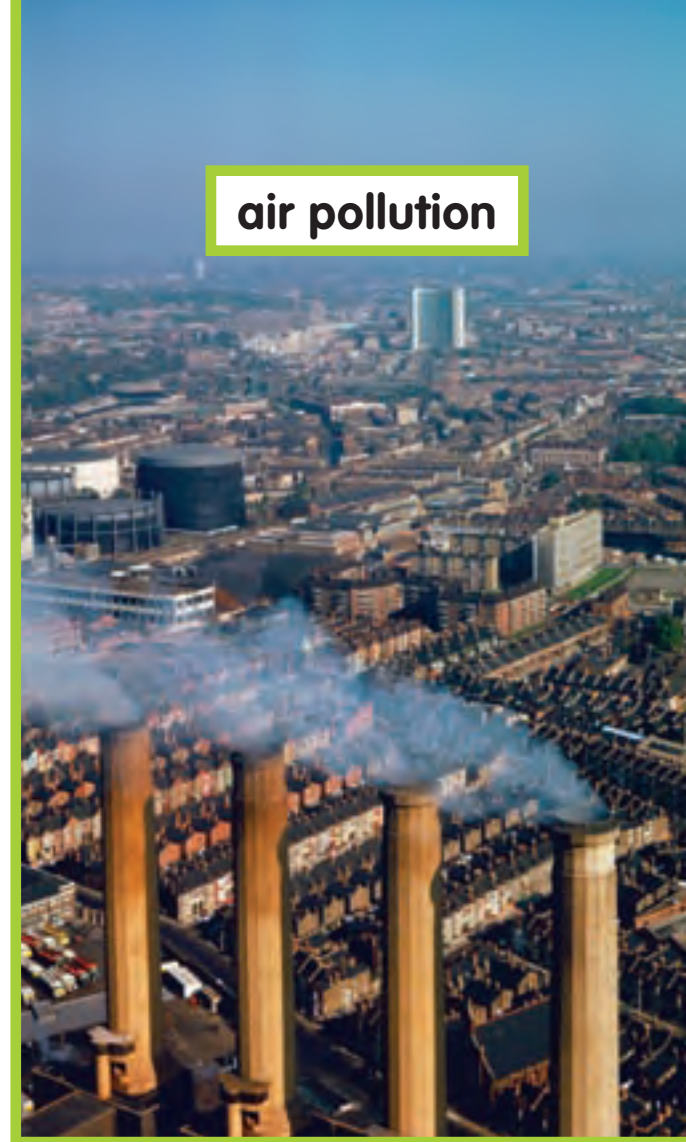
Use a sticky lid to catch what is in the air.



People and other living things can get sick if soil, water, or air are not clean.

There are many ways to keep Earth clean.

- ✓ How can pollution be harmful?



Think, Talk, and Write

- Cause and Effect.** What can happen if air gets polluted?
- Write about how you use water.

Social Studies Link

Write about why you should not throw garbage on the ground or in the water.

LOG ON e-Review Summaries and quizzes online at www.macmillanmh.com



Meet Mark Siddall

It is important not to pollute Earth's waters. Many animals, like leeches, live in water. They need clean water to live.

Mark Siddall is a scientist at the American Museum of Natural History. He finds leeches in oceans, swamps, ponds, and streams.

Mark wants to know how many different leeches there are and how they take care of their young.

- ◀ **Mark is an invertebrate zoologist. That is a scientist who studies animals that do not have backbones.**



SWK-3. Explain that everybody can do science, invent things and have scientific ideas no matter where they live.
ELA RP I.8. Answer literal, simple inferential and evaluative questions to demonstrate comprehension of grade-appropriate print texts and electronic and visual media.

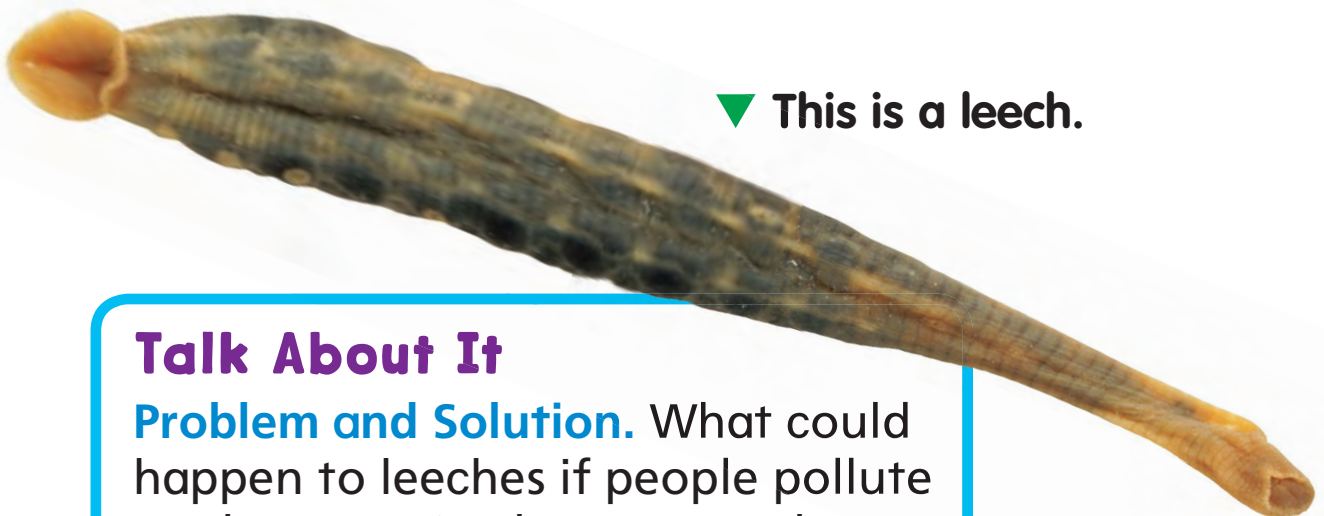




▲ This is Mark in his lab.



▲ Leeches suck blood to live. Mark uses his ankle as bait.



▼ This is a leech.

Talk About It

Problem and Solution. What could happen to leeches if people pollute Earth's water? What can we do to keep the leeches safe?

Lesson 3

Saving Earth's Resources

Look and Wonder

What do you think happens to the things you throw away?



ESS-2. Explain that the supply of many resources is limited but the supply can be extended . . . **ST-3.** Identify some materials that can be saved for community recycling . . . **ST-5.** Identify how people can save energy by turning things off when they are not using them . . .

What happens to plastic when you throw it away?

What to Do

- 1 Put a piece of toilet paper into a cup of water. Put a piece of a plastic bag into another cup of water.
- 2 **Observe.** Leave the cups overnight. What happens to the paper and the plastic?
- 3 **Infer.** What would happen to a plastic bag and a paper bag if they were left outside on the ground?

Explore More

- 4 **Investigate.** Try this activity again using other materials.

You need



toilet paper



two cups of water



plastic bag

Step 1



Read Together and Learn

Vocabulary

conserve

reuse

reduce

recycle

How can we reuse resources?

It is important to conserve natural resources.

To **conserve** means to save, keep, or protect.

One way to conserve resources is to reuse things.

To **reuse** means to use things again in a new way.



When you reuse things you do not have to buy new things. This keeps us from using up natural resources.

Quick Lab

Find a way to reuse something that you usually throw away.

✓ Why is it important to reuse things?



Reuse It



Read a Photo

What was reused to make this castle?

How can we save resources?

People can also save resources by reducing how much of a resource they use.

When you **reduce** what you use, you use less of it.



▲ You can turn off a light when you leave a room to save electricity.



▲ You can shut the water off when you brush your teeth to save water.

FACT Turning off the water each time you brush your teeth saves 38 juice boxes of water!

We can also recycle some materials so we do not have to use resources to make new ones.


To **recycle** means to make a new thing from an old thing. We can take used paper and recycle it into new paper!

 Why is it important to recycle?

Many towns recycle paper, plastic, and glass. ▶




Think, Talk, and Write

1. **Problem and Solution.** How can we make sure we do not use up our natural resources?
2.  Write about how you can reuse things in your classroom.

Social Studies Link

Find out what your community recycles.

 **e-Review** Summaries and quizzes online at www.macmillanmh.com

Saving Water

This girl is wasting water. She can save water by taking a drink and then turning off the fountain.



Write About It

Write about other ways people waste water. Tell what they can do to save water.

Remember

Use words to describe how to conserve water.



Write about it online at www.macmillanmh.com



ST-5. Identify how people can save energy by turning things off when they are not using them (e.g., lights and motors). **ELA WA I.2.** Write responses to stories that include simple judgments about the text.

Recycling Cans

John and his class picked up cans to recycle every day for one week. They made this picture graph.



Read a Graph

On which day did John's class collect the most cans?

If the class got 5 cents for every can they collected, how much money would they have made on Monday?




Remember

You can use a graph to share your data with others.



ST-3. Identify some materials that can be saved for community recycling . . .
M DAP I.4. Read and interpret charts, picture graphs and bar graphs as sources of information to identify main ideas, draw conclusions, and make predictions.

A young girl with dark hair is swimming in a pool, her head and arms visible above the water. She is wearing a blue swimsuit. The water is bright blue and splashing around her. In the top left corner, there is a blue sign with a white border and a yellow clip at the top. The sign has the text "I Read to Review" in white on a blue background, and "My Resources Book" in blue on a white background.

I Read to Review

My
Resources
Book

We use natural resources every day.
We use water and air in lots of ways.



Soil is where plants can be found.
Some animals even live under ground.



We use rocks in many ways.
We even use them when we play.



We need to use resources with care.
We want them to always be there.

CHAPTER 4 Review

Vocabulary

Use each word once to complete the sentences.

1. Water, rocks, plants, and some foods are all _____.
ESS-1
2. When our air and water get dirty, it is called _____.
ESS-2

conserve

natural resources

pollution

reuse



3. When we use things over again we _____ them.
ESS-2
4. To save and protect our natural resources means to _____.
ESS-2

Answer the questions below.

5. How does soil help plants?

ESS-1



6. **Investigate.** How does your school reuse, reduce, or recycle? Make a plan to find out.

SI-8

7. **Problem and Solution.** How could you reduce the amount of paper you use in school?

ESS-2

8. Make a list of natural resources you used today.

ESS-1



9. Why do we need to care for Earth?

ESS-1

CHAPTER 5

Seasons and Living Things

Lesson 1

Spring and Summer 178

Lesson 2

Fall and Winter 186



What do you know about weather?

Key Vocabulary



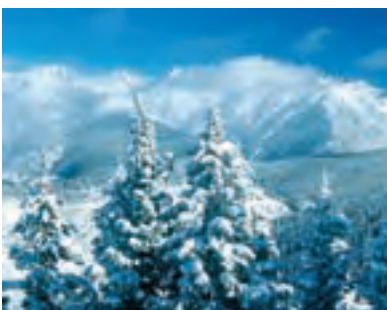
spring the season
after winter (page 180)



summer the season
after spring (page 182)



fall the season after
summer (page 188)



winter the season
after fall (page 190)

More Vocabulary

season, page 180





Lesson 1

Spring and Summer

Look and Wonder

This tree has flowers. What kinds of flowers do you see in spring?



Do seeds grow faster when it is warm or cold?

What to Do

- 1 Plant radish seeds in two cups of soil. Cover the cups with foil.
- 2 Put one cup in a warm place. Put the other cup in the refrigerator.
- 3 **Predict.** Which do you think will grow faster?
- 4 **Compare.** Check the cups every day. What happens?

Explore More

- 5 **Infer.** What do you think will happen if you take the seeds out of the refrigerator and put them in a warm place?

You need



cups



soil



radish seeds



aluminum foil

Step 1



Read Together and Learn

Vocabulary

season

spring

summer

What happens in spring?

The weather changes in many places during the year.

A **season** is a time of year.

Spring, summer, fall, and winter are the four seasons.

In **spring**, there are many hours of sunlight.



Sunlight in Spring

Date	Sunrise	Sunset	Hours of Sunlight
March 21	6:10 A.M.	6:21 P.M.	12 hours, 11 minutes

Read a Chart

If you played outside on March 21, what time would it get dark?

Sunlight warms the land, air, and water. It can also rain a lot in spring. Sunlight and rain help plants grow. Growing plants are food for many animals.

Spring weather where you live is probably similar each year.

Quick Lab

Draw what kind of clothes you wear in different seasons.



✓ What is spring like where you live?

▼ In spring plants begin to sprout and many animals are born.



What happens in summer?

Summer is the season after spring. It is the warmest season. The weather can be very sunny and dry in summer.



Sunlight in Summer

Date	Sunrise	Sunset	Hours of Sunlight
June 21	5:43 A.M.	8:37 P.M.	14 hours, 54 minutes

- ▼ In summer it may be very hot. A cold drink can help you cool off.



Lots of sunlight helps plants grow. Many plants grow fruits.

There is a lot of food for animals to eat. Young animals grow bigger and stronger in the summer.

✓ Is summer where you live the same every year?



▲ In summer there are more plants for animals to eat.


Think, Talk, and Write

1. **Main Idea and Details.** What is a season?

✎ 2. Write about and draw what happens in spring.

Health Link

Why do you need to wear sunblock when you are outside?

LOG ON  e-Review Summaries and quizzes online at www.macmillanmh.com



Museum Mail Call

What is spring like in other places? Scientists at the American Museum of Natural History collect stories to learn about people around the world.

Dear Museum,

Be Méeybaan, how are you? I live in Pakistan. My people, the Hunza, live in the mountains.

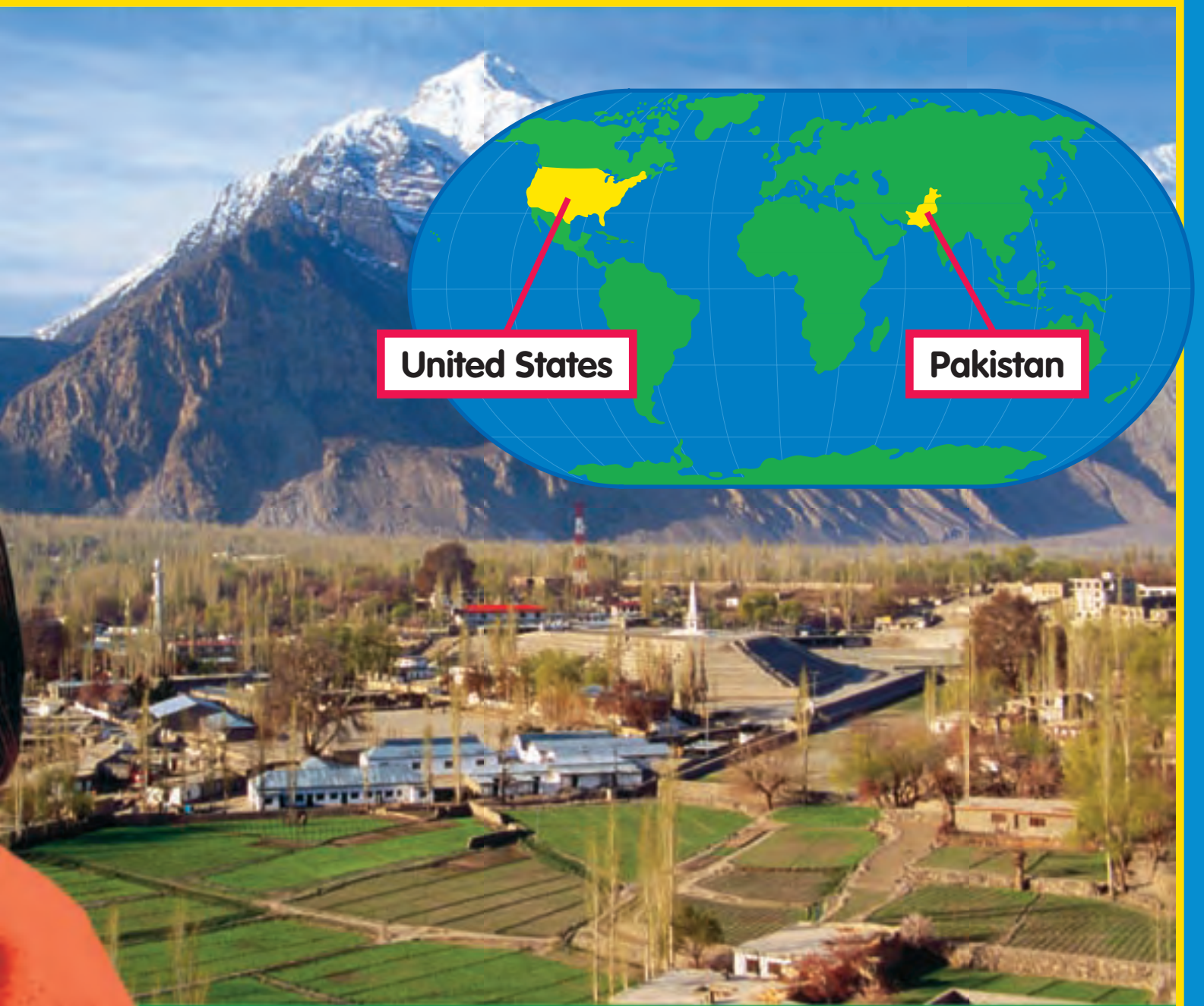
It is April. Spring is here. We plant seeds and celebrate. It does not rain much here.

Each spring, the large, icy glaciers above our village melt. We dig ditches so the water from the melted glaciers can flow onto our land. This helps our seeds grow!

From,

Nazir





▲ The Hunza live in the mountains of Pakistan.

Talk About It

Main Idea and Details. What happens in spring that helps the Hunza farmers' seeds grow?



LS-5. Recognize that seasonal changes can influence the health, survival or activities of organisms. **ELA RP I.6.** Recall the important ideas in fictional and non-fictional texts.

Lesson 2

Fall and Winter

Look and Wonder

What is the season here?
How do you know?



How do sweaters keep us warm?

What to Do

- 1 Fill two jars with warm water. Wrap one jar with a thick cloth.
- 2 **Predict.** Which jar will stay warmer? Why?
- 3 **Measure.** Measure the temperature of the water in each jar with a thermometer. Record your results. Measure again in 10 minutes.

Explore More

- 4 **Infer.** How is wrapping cloth around a jar like wearing a sweater on a cool fall day?

You need



two jars



water



cloth



two thermometers

Step 3



SI-6. Use appropriate tools and simple equipment/instruments to safely gather scientific data . . . **SI-8.** Use oral, written and pictorial representation . . .

Read Together and Learn

Vocabulary

fall

winter

What happens in fall?

Fall is the season after summer. In fall, there are fewer hours of sunlight than in summer.

Less sunlight makes the air cooler. Some leaves change color and fall off trees in fall.

Sunlight in Fall

Date	Sunrise	Sunset	Hours of Sunlight
September 21	6:55 A.M.	7:07 P.M.	12 hours, 12 minutes

Many fruits get ripe in fall. People can pick the fruits and eat them.



In fall animals begin to get ready for winter. Some animals grow thicker fur to keep warm. Some even move to warmer places.

✓ What is fall like where you live?



▲ These birds fly south for winter.

Quick Lab

Find out how leaves look different in each season.



▲ This chipmunk stores nuts in fall so that it has food to eat in winter.

FACT

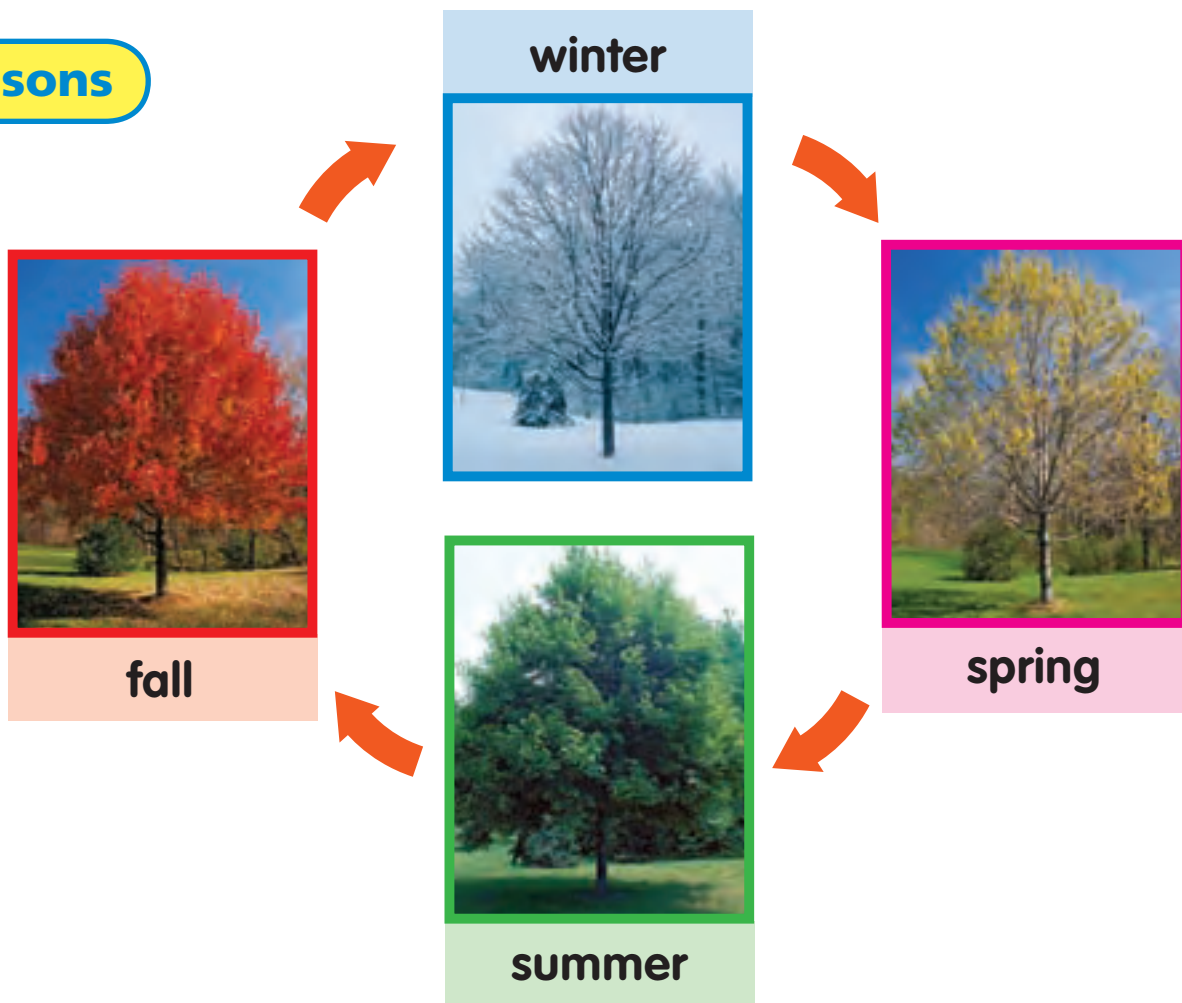
When it is fall where you are, there are other places on Earth where it is spring.

What happens in winter?

Winter is the coldest season of the year. In winter there are fewer hours of sunlight. It may even snow.

Less sunlight means some plants die. The last of the leaves fall off some trees.

Seasons



Read a Diagram

What happens to the tree in each season?

There are fewer plants in winter. There is not a lot of food for animals to eat. Some animals search for food. Others eat food they stored in fall. Some animals go to sleep until spring.



▲ This dormouse will rest here all winter.

Sunlight in Winter

Date	Sunrise	Sunset	Hours of Sunlight
December 21	7:23 A.M.	4:49 P.M.	9 hours, 26 minutes


✓ What is winter like where you live?

Think, Talk, and Write

1. **Summarize.** How do animals get food in winter?
2. Write about what the weather is like in fall.

Social Studies Link

Describe different things people do in each season where you live.

LOG ON  -Review Summaries and quizzes online at www.macmillanmh.com

Seasons Change

Look closely at the pictures below.
What is the same in each picture?
What is different? Which season does each picture show? How do you know?



Write About It

Write about one of the pictures. Describe the weather. What could you wear and do if you were there?

Remember

Use words to tell how something looks, feels, and sounds.



Journal Write about it online at www.macmillanmh.com

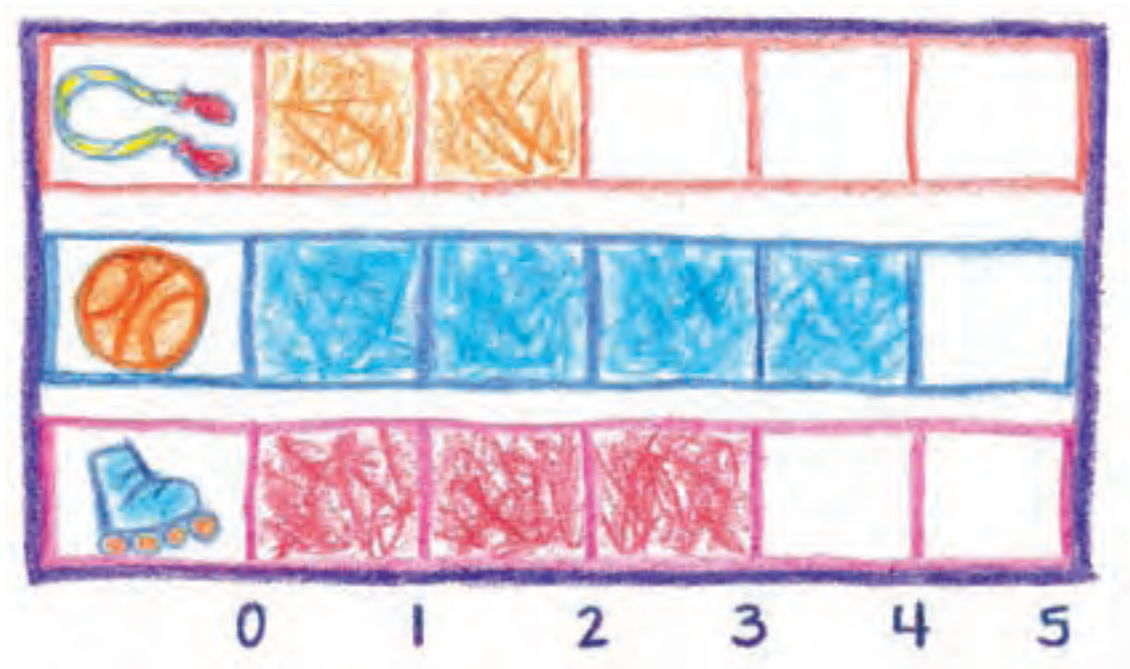


Weather Graph

Anna asked her friends which activity they liked to do best on sunny days. She made a bar graph to show what she found out.



Sunny Day Activities



Make a Graph

Ask your classmates if they like to read a book, play a game, or draw a picture on a rainy day. Make a bar graph to show what you find out.

Remember

A bar graph needs a title.



SI-5. Create individual conclusions about group findings. **SI-8.** Use oral, written and pictorial representation to communicate work. **M DAP I.3.** Display data in picture graphs with units of 1 and bar graphs with intervals of 1.

I Read to Review

My Seasons Book



Spring can be wet.
I need my rain boots.
I like all of the new plants.



Summer can be sunny.
I need my hat.
I like to play in the sand.



Fall can be cool.
I need my jacket.
I like to play in the leaves.



Winter can be cold.
I need my mittens.
I like to play in the snow.

CHAPTER 5 Review

Vocabulary

Use each word once to complete the sentences.

fall

summer

spring

winter

1. The warmest season is _____.

LS-5



2. _____ is the season that follows winter.

LS-5



3. The season with the fewest hours of daylight is _____.

LS-5



4. In _____, animals begin to grow thicker fur to keep warm.

LS-5



Answer the questions below.

5. How is the weather different in the pictures below?

SI-9



6. **Compare.** How do living things change with the seasons?

LS-5

7. **Main Idea and Details.** In which season do trees lose leaves and animals move to warmer places?

LS-5



8. What do you know about weather?

SWK-2

A large elephant with white tusks is splashing in a river. The elephant is the central focus, with its trunk and tusks visible. The background shows a natural setting with trees and grass. The image is overlaid with text boxes and a magazine cover graphic.

Literature

National Wildlife Federation

**Ranger
Rick**

Magazine Article

**This elephant knows
just the thing for a
hot day—a cool bath!**

Weather and ANIMALS

What do animals do in different kinds of weather? Let's find out!

Hot

The turtle lies in the sun to get warm.



▲ turtle lying in the sun

Cold

It is a cold, snowy day. The fox curls up. It uses its bushy tail as a blanket.



▲ arctic fox curling up

Rainy

Here comes the rain! The butterfly hides under a leaf. It hangs upside down to stay dry.



▲ butterfly hiding

Talk About It

Can all animals survive in all kinds of weather?

Careers in Science

Hydrologist

Do you want to help care for Earth? A hydrologist is someone who studies water. Hydrologists study water in lakes, rivers, ponds, streams, and even under the ground.

Hydrologists test water to make sure it is clean and safe for plants and animals. They also study how water flows. They work to stop floods.



hydrologist

More Careers to Think About



gemologist



geologist

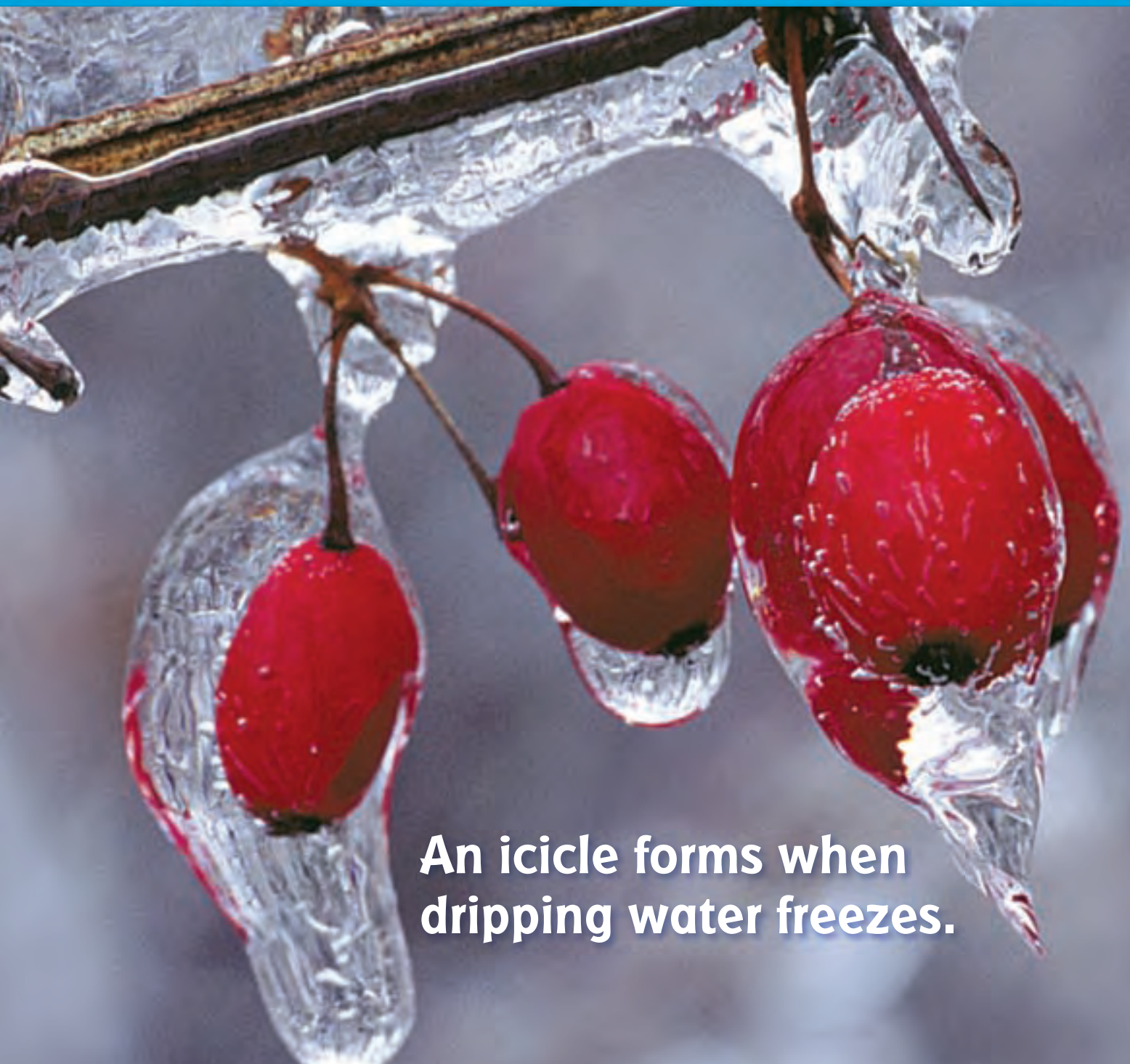
LOG ON e-Careers at www.macmillanmh.com



Ohio



Physical Sciences



**An icicle forms when
dripping water freezes.**



Great Lakes Science Center



wind turbine blades



Wind Energy

Energy makes things work. Wind energy turns this wind turbine. This turbine is near the Great Lakes Science Center in Cleveland, Ohio. Energy from the turbine makes electricity. Electricity is a form of energy. Electricity from the turbine is used at the Science Center.

A Windy Place

People can use energy from nature. Wind is one form of natural energy. Workers at the Great Lakes Science Center want to show people how wind energy can be used. The turbine works with a wind speed of 8–31 miles per hour. Wind energy does not cause pollution.

Think, Talk, and Write

Critical Thinking What would happen if the wind stopped blowing?



PS-7. Explore how energy makes things work . . .

PS-9. Describe that energy can be obtained from many sources in many ways . . .

Ohio

A CLOSER LOOK



Main Idea

Wind turbines use wind to make electricity. Wind turbines work best in windy places.

Activity

Compare. Look at an electric fan and the picture of a wind turbine.

■ How are the fan and turbine alike? How are they different?





Dayton Air Show



Dayton
International Airport



a biplane flying
upside down

Planes That Do Tricks

Every year, the Dayton Air Show has planes that do tricks as they fly. The planes fly straight up and down. They fly in circles. They also fly back and forth over the ground.

Fast Planes

Planes have powerful engines that make them move. These planes move very fast. They move much faster than a car. A car on a highway moves about 60 miles in one hour. These planes can fly as fast as 1,500 miles in one hour.



Think, Talk, and Write

Critical Thinking What are some different ways that planes can move?

Ohio

A CLOSER LOOK



Main Idea

Objects can move in different directions and at different speeds.

Activity

Classify Draw things that move fast, slow, forward or backward, and in circles.

- Make a paper airplane.
- Move it in different ways, but do not throw it.



PS-6. Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop.



CHAPTER 6

Matter Everywhere

Lesson 1

Describing

Matter 210

Lesson 2

Matter Can

Change 218

Lesson 3

Making

Mixtures 224

Lesson 4

Heat Can

Change Matter 232



How can matter change?

Key Vocabulary



balance a tool used to measure mass
(page 214)



mixture two or more different things put together (page 226)



dissolve to completely mix into a liquid (page 228)



freeze to change from a liquid to a solid (page 234)

property,
page 212

matter, page 213

mass, page 214

burn, page 220

melt, page 235

evaporate,
page 236



PS-A. Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change.

Lesson 1

Describing Matter

Look and Wonder

What kinds of different objects do you see here? How would you describe them?



How can you compare objects?

What to Do

- 1 Collect five solid objects around your classroom.
- 2 **Compare.** Describe the objects' properties. How are they alike? How are they different? Sort them by their properties.
- 3 **Measure.** Use a balance to put the objects in order from the most mass to the least mass.

Explore More

- 4 **Classify.** What other properties can you use to sort the objects?

You need



classroom objects



balance

Step 3



Read Together and Learn

Vocabulary

property

matter

mass

balance



- ▲ Brown and soft are two properties of this toy bear.

What is matter?

When you describe something, you talk about its properties.

Properties are how something looks, feels, smells, tastes, and sounds. Color, size, and shape are properties.



- ▲ Describe some of this kite's properties.

Every kind of matter has its own properties. **Matter** is what all things are made of.

Solids, liquids, and gases are three forms of matter. All matter takes up space.

Quick Lab

Describe and sort some objects in your classroom.



✓ What is matter?

▼ The water, raft, girl, and air are all matter.

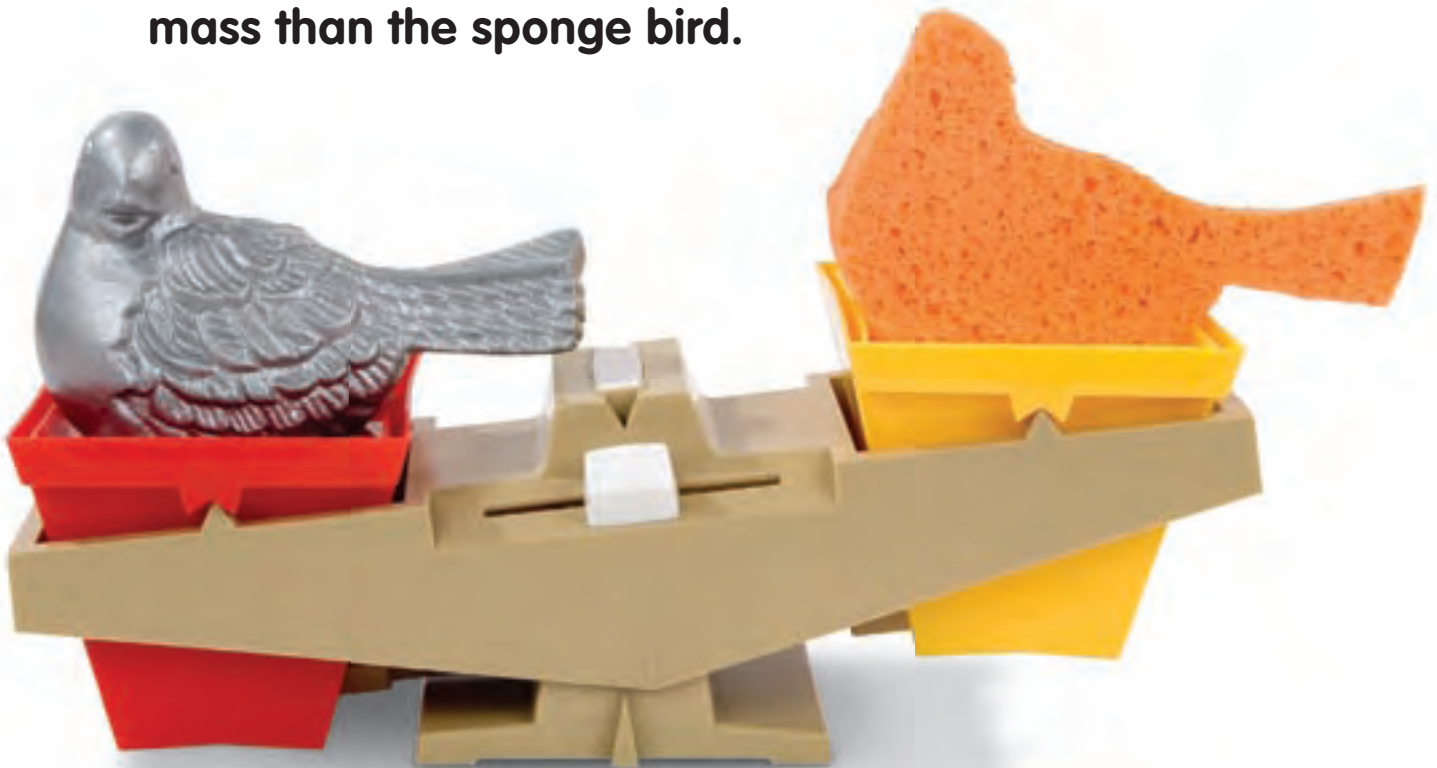


What is mass?

Mass is also a property. **Mass** is how much matter is in an object. All objects have mass.

Heavier objects have more mass than lighter objects. A **balance** can be used to measure mass.

- ▼ The metal bird has more mass than the sponge bird.



Comparing Mass




Read a Photo

Which car has more mass?
How could you find out?


✓ How can you measure mass?

Think, Talk, and Write

- Put Things in Order.** Use a balance to put three objects in order from the least mass to the most mass.
-  Write about and draw a picture of your shoes. Describe their properties.

Music Link*

Listen to "What Matters Is Matter" on the Science Songs CD.

 **e-Review** Summaries and quizzes online at www.macmillanmh.com

BUILDING BLOCKS

Do you know the story about the three little pigs? Each pig built a house from a different material to hide from the wolf.

The first pig used straw to build a house. Straw is dry, hollow grass stalks. Straw can make walls and a roof.



ST-1. Explore that some kinds of materials are better suited than others for making something new (e.g., the building materials used in the *Three Little Pigs*). **ELA RP 1.4.** Make predictions while reading and support predictions with information from the text or prior experience.

The second pig used wood to build a house. Wood comes from the trunks and branches of trees.

Wood is stronger than straw. A wood house can last for more than a hundred years.



The third pig used bricks to build a house. Bricks are made from hard clay. Bricks are very strong. A brick house can last for more than a thousand years.



Talk About It

Predict. Which one of these materials would make the strongest building? Why?



Lesson 2

Matter Can Change

Look and Wonder

In Japan, people change paper into different shapes. It is called origami. How has this paper been changed?



How can you change some solids?

What to Do

- 1 Observe.** Describe a piece of paper, aluminum foil, and a tissue. How do they look and feel?
- 2 Investigate.** How can you change each solid?
- 3 Communicate.** What changed about each solid? What stayed the same? Make a chart of the changes.

Explore More

- 4 Put Things in Order.** Put a few drops of water on the materials. Write what happens first, next, and last.

You need



paper



aluminum foil



tissues

Step 3



Read Together and Learn

Vocabulary

burn

How can matter change?

You can bend, fold, or tear some solids. The solid looks different. But it is still made out of the same thing.

Sometimes matter can change into something else. When you **burn** matter, heat and air change its properties.

Shaping Clay



Read a Photo

How has this clay been changed?



◀ When you cut paper, the pieces are smaller. But it is still paper.



◀ When paper burns, it turns into ash. It is no longer paper.

Quick Lab

Investigate how sunlight can change paper.



✓ How can you change an apple?

Think, Talk, and Write

1. **Problem and Solution.** Your homework got crumpled. How can you change it back to how it was?
2. Write about how burning changes the properties of paper.

Art Link

Try to make a boat using paper.

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Focus on Skills

Inquiry Skill: **Measure**

You **measure** to find out the size or amount of something. You can use string or cubes to measure how long or wide something is. You can also use a ruler to measure some things.

► **Learn It**

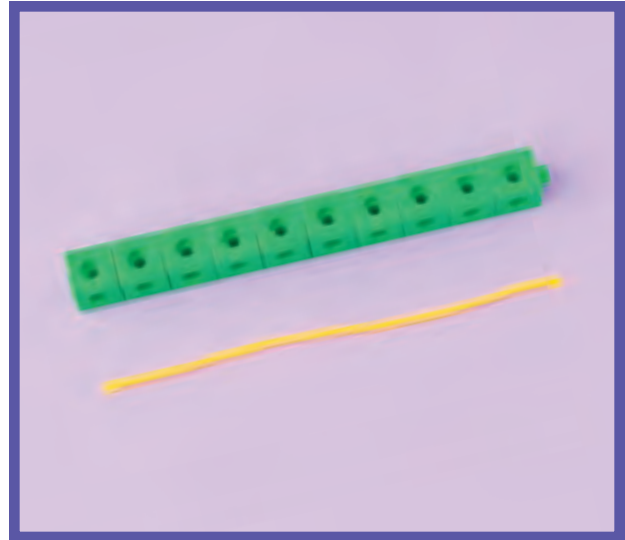
Whitney used cubes and a ruler to compare the length of three books. She made a chart to show what she found out.

The chart is a hand-drawn table with three columns: 'Book', 'Cubes', and 'Inches'. It lists three books and their measurements. The text is written in blue and green ink on a white background with a yellow border.

Book	Cubes	Inches
I Spy	13 cubes	10 inches
The Biggest Tree	9 cubes	7 inches
Watch It Grow	9 cubes	7 inches

▶ Try It

Look at the pictures below.



1. How many cubes around is the can in the picture?
2. Use string to measure the width of two classroom objects. How many cubes wide is each object?
3. Use a ruler to measure the cubes. Make a chart like Whitney's to show what you find out.



A claw machine filled with a variety of colorful stuffed animals, including teddy bears, bunnies, and other creatures. The machine's metal claw is visible at the top right, hanging over the collection of toys.

Lesson 3

Making Mixtures

Look and Wonder

Some mixtures are made of solids. What do you see in this mixture?



Can you take a mixture apart?

What to Do

- 1 Observe.** Mix sand and birdseed together. What do you notice?
- 2 Predict.** How could you separate your mixture?
- 3 Investigate.** Pour your mixture into a strainer. What happens?
- 4 Put Things in Order.** Write what happens first, next, and last.

Explore More

- 5 Investigate.** Could you separate the mixture if you added water? Why or why not? Try it!

You need



cup



sand



birdseed



strainer



clear bin



Step 3



Read Together and Learn

Vocabulary

mixture

dissolve



Explore making mixtures with the Junior Rangers.

What is a mixture?

A **mixture** is two or more different things put together.

When you mix some solids, they do not change. You can see the parts of the mixture. You can take them apart.

It is easy to take this mixture of solids apart. ►



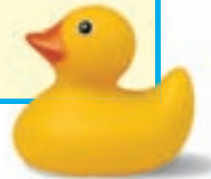
When you mix solids with water, some objects will float. Others will sink.

Sometimes you can pick the solids out of the water.

- ✓ What are some ways to separate a solid mixture?

Quick Lab

Investigate what sinks and what floats in water.



Sink and Float



Read a Photo

Why do you think the red balls float and the marbles sink?



What are some other mixtures?

Some mixtures are hard to take apart. When you mix a solid and a liquid, some solids **dissolve**, or mix completely into the liquid. Some liquids mix completely, too.

▼ Drink mix will dissolve in water.

▼ You can not take food coloring out of water.



FACT A solid that dissolves in water may not dissolve in other liquids.

Some liquids do not mix together. Oil and water do not mix. The two liquids stay apart.

Oil floats on top of water. ▶



- ✓ What mixtures are not easy to take apart?

Think, Talk, and Write

1. **Main Idea and Details.** Describe a mixture made of two solids.
2. Write and draw about a solid that you can mix with water.

Music Link*

Listen to "Mix and Change" on the Science Songs CD. Add your own verse.

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Trail Mix Recipe

Carrie made trail mix. She used this recipe. She mixed everything together.



Carrie's Trail Mix

2 cups dried fruit 

1 cup nuts 

1 cup raisins 

Write a Number Sentence

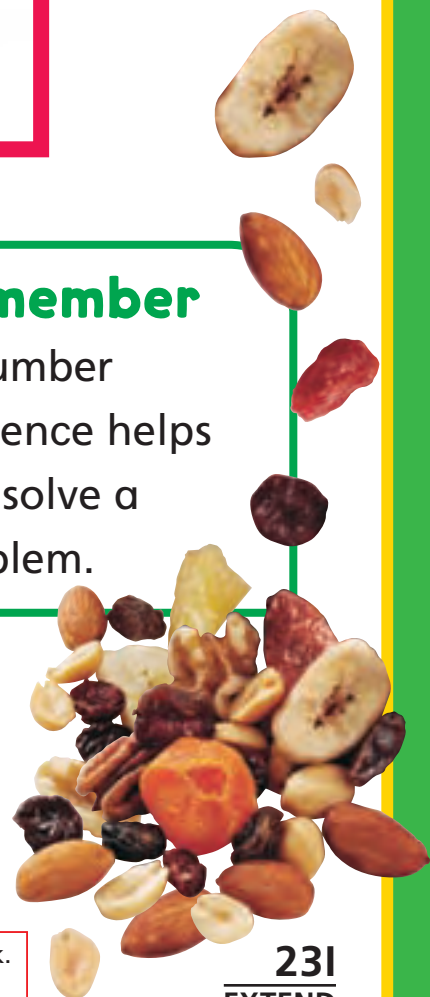
Make your own trail mix.
Write a number sentence
to show how many cups
of each food you used
in your mix.

Remember

A number
sentence helps
you solve a
problem.



SI-8. Use oral, written and pictorial representation to communicate work.
M NS I.10c. Write number sentences to represent addition.



Lesson 4

Heat Can Change Matter



Look and Wonder

In winter, frozen water falls from the sky as snow. What can happen to the snow on a sunny day?



How can heat change ice?

What to Do

- 1 Measure.** Take the temperature of a cup of cold water. Then take it of a cup of warm water.
- 2 Predict.** In which cup will an ice cube melt faster? Add one ice cube to each cup.
- 3 Put Things in Order.** Which ice cube melted first? Why?
- 4 Measure.** Take the temperature of the water again. Did it change?

Explore More

- 5 Investigate.** Try this activity again. Did you get the same results?

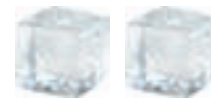
You need



cups
of water



thermometer



ice

Step 2



SWK-I. Discover that when a science investigation is done the same way multiple times, one can expect to get very similar results each time it is performed.

Read Together and Learn

Vocabulary

freeze

melt

evaporate



Explore how heat can change matter with the Junior Rangers.

How can solids and liquids change?

You can change liquid water to a solid. When a liquid gets very cold, it can freeze.

To **freeze** means to change from a liquid to a solid.

- ▼ When you put liquid water in a freezer, it turns into a solid.

Forms of Water



You can change frozen water back into a liquid. When heat is added to a solid, it melts.

To **melt** means to change from a solid to a liquid. Different solids melt with different amounts of heat.

Quick Lab

Use a balance to see if water has the same mass as ice.



- ▼ When the ice melts, the water in the cup is the same amount of water that you started with.



Read a Photo

How did the water change?
How did it stay the same?



What happens when you add heat to a solid?



Science in Motion Watch water change states at www.macmillanmh.com

How can liquids and gases change?

When water gets warm, some water evaporates. To **evaporate** is to go into the air as a gas.

The more heat you add to water, the faster it will evaporate.

Water vapor is water as a gas.



▲ At one time, this pond was full of water.



▲ Some water evaporated and the pond got smaller.

When water vapor gets cool, it changes into a liquid.

When water vapor in the air touches a cool glass, it turns back into water. That is why your glass is sometimes wet on the outside.




✓ What happens when water is heated?

▲ You can see water drops on this pitcher.


Think, Talk, and Write

1. **Summarize.** How can water change from a solid to a liquid?

 2. Write about how water can change to a gas.

Health Link

Make frozen juice pops from fruit juice.

 **e-Review** Summaries and quizzes online at www.macmillanmh.com

You need



2 cups



water



marker



plastic wrap



rubber band

How can water change to gas?

Find out what happens to the water in two cups if you leave them out for one week.

What to Do

- 1 Fill two cups with the same amount of water. Mark the water level on each cup.



- 2 Cover one cup with plastic wrap. Put both cups in a sunny place.



- 3 **Predict.** What do you think will happen to the water in each cup after one week?

- 4 **Record Data.** Record the water levels every day for one week on a chart.

- 5 **Put Things in Order.** Write what happens first, next, and last.

- 6 **Compare.** Where did the water in each cup go? What did the cover do?



Investigate More

- 7 **Investigate.** How could you make the water evaporate faster? Make a plan to test your ideas.



SI-1. Ask “what happens when” questions. **SI-2.** Explore and pursue student-generated “what happens when” questions.

I Read to Review

My Mixtures Book



You can make
many mixtures.



Some are easy to take apart. Others are not.



Fruit salad can
be taken apart.
Smoothies cannot.





Apples can be
taken out of a pie.
Pumpkin cannot.



CHAPTER 6 Review

Vocabulary

Use each word once to complete the sentences.

dissolve

freeze

melt

mixture

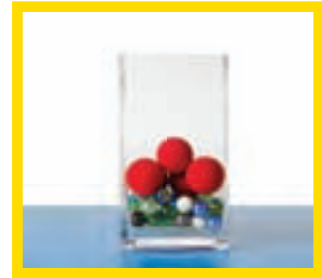
1. Some solids completely mix, or _____ in water.

PS-3



2. Two or more things put together make a _____.

PS-3



3. To change from a solid to a liquid means to _____ something.

PS-3



4. To change from a liquid to a solid means to _____ something.

PS-3



Answer the questions below.

5. Describe the properties of a rock.

PS-1

6. **Problem and Solution.** How can you stop a frozen juice pop from melting?

PS-3



7. **Put Things in Order.** Tell how burning changes paper.

PS-4



8. How many different ways can you change paper?

PS-4



9. How can matter change?

PS-3, PS-4



CHAPTER 7

Motion and Energy

Lesson 1

Position and Motion 248

Lesson 2

Pushes and Pulls 256

Lesson 3

Magnets 264

Lesson 4

Energy and Heat . . . 272

Lesson 5

Electricity 280



How can you make things move?

Key Vocabulary



push a force that moves something away from you
(page 258)



pull a force that moves something closer to you
(page 258)



magnet something that can pull, or attract, some objects with metal in them
(page 266)



heat a form of energy that makes things warm (page 276)

More Vocabulary

position, page 250

motion, page 252

speed, page 253

force, page 258

gravity, page 259

friction, page 261

poles, page 268

repel, page 269

energy, page 274

electricity,
page 282



PS-A. Discover that many objects . . . have different characteristics. Describe these characteristics and recognize ways an object may change.
PS-B. Recognize that . . . objects move in different ways. **PS-C.** Recognize sources of energy and their uses.

Lesson 1

Position and Motion

Look and Wonder

It is a race! Who is winning the race? How can you tell?



How do you know something moved?

What to Do

- 1 Put three objects on a table.
- 2 **Observe.** Look closely at the objects. Where are they on the table?
- 3 Cover your eyes. Have your partner move one object.
- 4 **Infer.** Open your eyes. Which object did your partner move? How can you tell?

You need



classroom objects



Step 3

Explore More

- 5 **Investigate.** Can making a map of the table and objects help you find out which object moved? Try it.



Read Together and Learn

Vocabulary

position

motion

speed

How can you tell where something is?

Have you ever told a friend where something is? You probably described the object's position.

Position is the place where something is located.

Find Things at a Fair



Position tells you if one thing is close to or far away from another thing. Position can tell you if an object is over, under, right, or left.

- ✓ What other words can you use to describe an object's position?



Read a Photo

Where are things located at this fair? Use position words.

How do things move?

Objects can move in many ways. **Motion** is a change in an object's position.

Things can move forward, backward, or in a circle. They can even zigzag!

Quick Lab

Make a ball move in a curvy line and in a straight line.



▲ This car drives down a curvy road.



▲ This airplane moves in a straight line.

Speed is how fast or slow something moves. Different objects move at different speeds.

A rocket ship moves much faster than an airplane. ▶

- ✓ How can you tell if one object is moving faster than another?

Think, Talk, and Write

1. **Compare and Contrast.** How are a rocket ship and an airplane alike? How are they different?
2. Write about the different ways you can move a ball.

Health Link

Have a classmate use position words. Move to the location he or she describes.

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Focus on Skills

Inquiry Skill: **Infer**

When you **infer**, you use what you know to figure something out.

► Learn It

Mark looked at a picture of cheetahs. He used what he knew about cheetahs' legs to infer which one could run faster. He recorded his ideas on a chart.

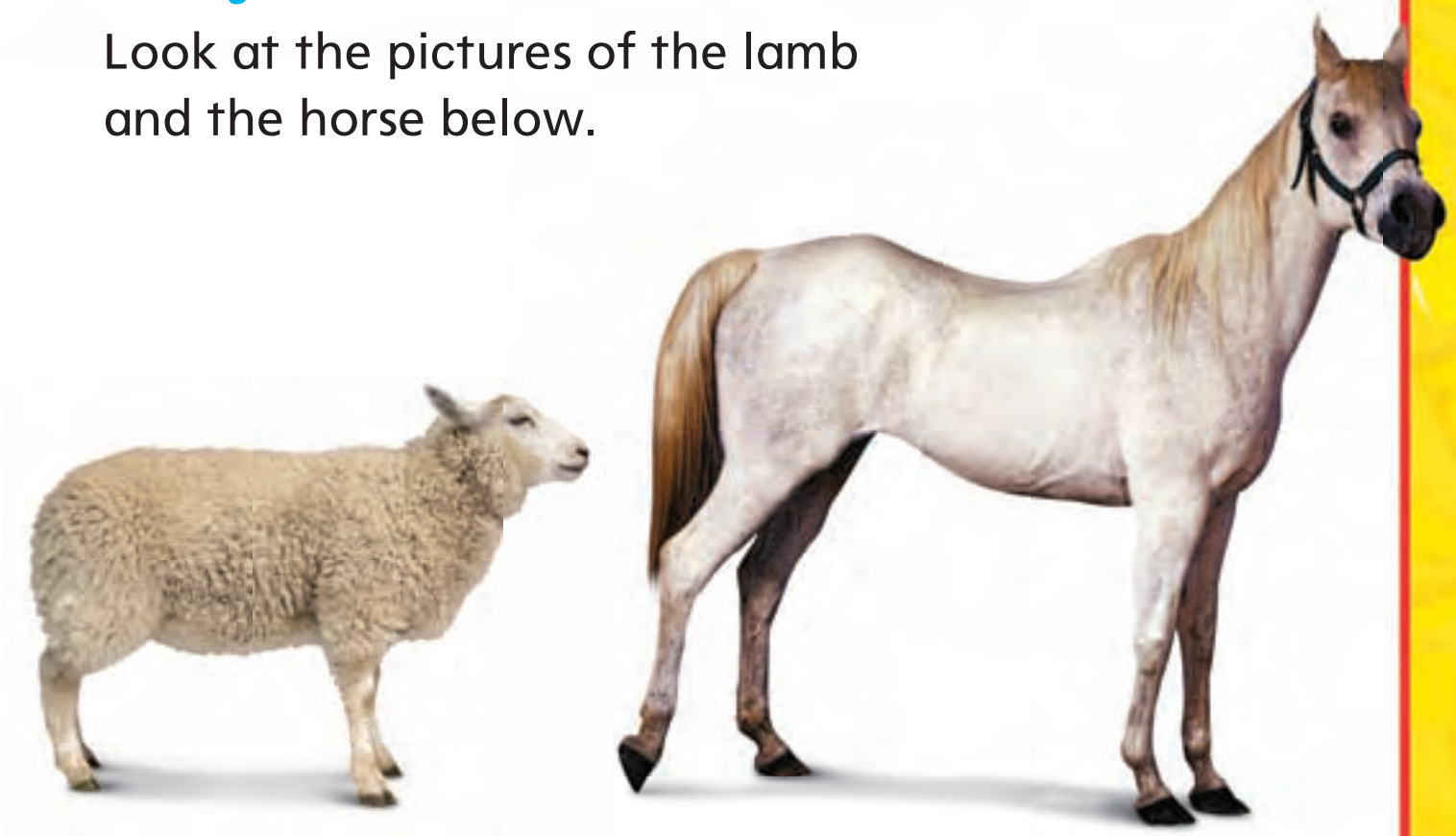
Mark's Chart


What I Know	What I Infer
The adult cheetah has longer legs.	The adult cheetah can run faster than the baby cheetah.



▶ Try It

Look at the pictures of the lamb and the horse below.



1. What do you observe about the body of each animal?
2. Which animal do you think can move faster? Why?
-  3. Use a chart like Mark's. Tell what clues you used to figure out which animal moves faster.



Lesson 2

Pushes and Pulls



Look and Wonder

This girl is climbing a rope.
How does she move up?



PS-5. Explore the effects some objects have on others even when the two objects might not touch (e.g. magnets). **PS-6.** Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop.

Explore

Inquiry Activity

How can you make something move?

What to Do

- 1 Fold an index card.
- 2 **Investigate.** Try different ways to make the card move. How can it move?
- 3 **Observe.** What changes about the card? What stays the same?

Explore More

- 4 **Infer.** Do you think a tissue will move in the same way as the card? Why or why not? Try it.

You need



index card



tissue

Step 1



SI-8. Use oral, written and pictorial representation to communicate work.
SWK-2. Demonstrate good explanations . . .

Read Together and Learn

Vocabulary

force

push

pull

gravity

friction

What makes things move?

Things can not move on their own. You have to use force to move them. A **force** is a push or a pull that makes an object move.

A **push** moves the object away from you. A **pull** moves it toward you.



◀ This girl pushes the basketball away from her.



▲ This boy pulls the bag of basketballs toward him.

Gravity is the force that pulls things toward Earth.

When you jump up, gravity pulls you back down. If you let go of something, gravity pulls it to the ground.

✓ What things do you push and pull every day?

Jumping Rope



Read a Photo

Will this girl stay up in the air? Why or why not?



Science in Motion Watch how gravity works at www.macmillanmh.com

Gravity pulls this egg to the ground. ▼



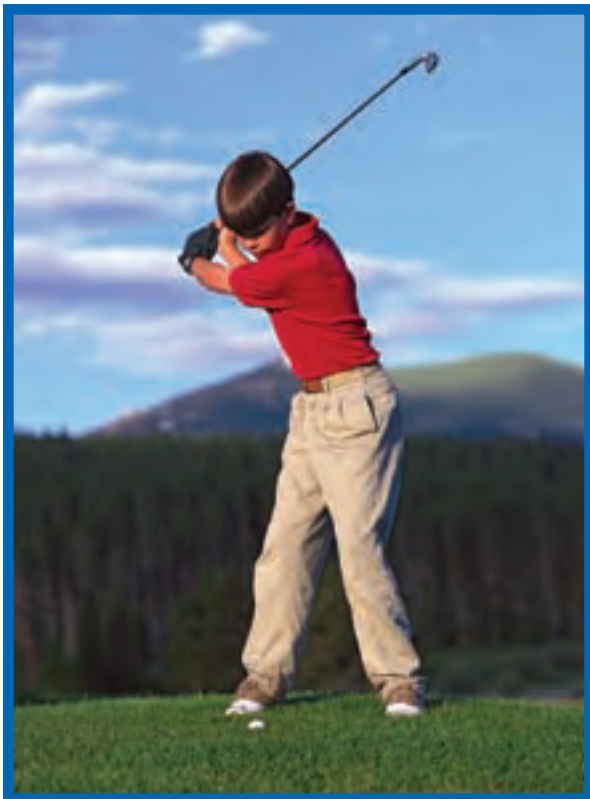
How are forces different?

The size of a push or pull moves things differently. A small push can move a light object. A bigger push can move a heavy object.

A big push also makes an object move faster and farther than a small push.

Quick Lab

Investigate how much force you need to slide a checker piece.



▲ This boy uses a big force to push the golf ball far away.



▲ This boy uses a small force to push the golf ball a short way.

Friction is a force that slows things down. **Friction** is two things rubbing together.

Have you ever dragged your feet to slow down on a swing? That is friction.



- ✓ What could make something move slower?



◀ Drag a rubber stopper on the ground. Friction makes you stop.

Think, Talk, and Write

1. **Cause and Effect.** What makes things fall to the ground?
2. Write about what can happen if you use a big push on a light object.

Social Studies **Link***

Describe a game that people play with a ball. What forces make the ball move?

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You need



honey



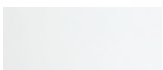
dish soap



mustard



ketchup



cardboard

Which liquid flows the fastest?

Observe the speeds of different liquids.

What to Do

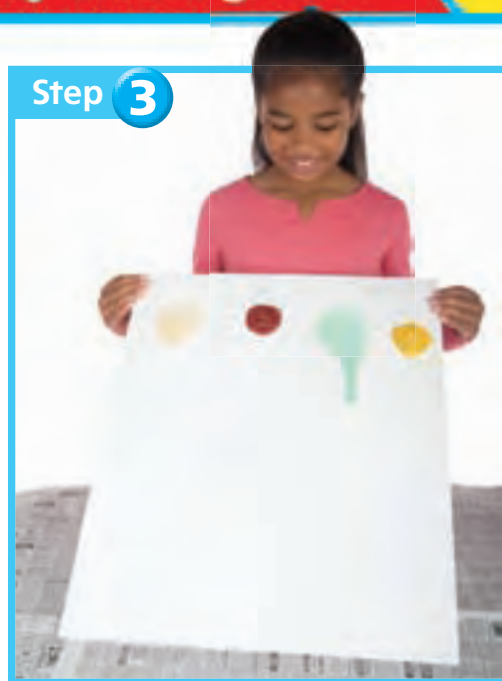
- 1 Predict.** Which liquid will flow the fastest? Which will flow the slowest?
- 2 Measure.** Place the same amount of each liquid on one end of a sheet of cardboard.

Step 2



- 3 **Compare.** Slowly lift the edge of the cardboard. Compare the positions of the liquids as they move.

- 4 **Record Data.** Use the chart below to record the speed of each liquid.



Liquids	
Fast	Slow

- 5 **Infer.** Why did some liquids flow faster than others?

Investigate More

Investigate. Repeat this experiment. Did you get the same results?



SWK-1. Discover that when a science investigation is done the same way multiple times, one can expect to get very similar results each time it is performed.

Lesson 3

Magnets



Look and Wonder

Magnets pull things toward them. Where are the magnets on this train?



What will a magnet pull?

What to Do

- 1 Predict.** Put objects that you think a magnet will pull in one pile. Put objects it will not pull in another pile.
- 2 Investigate.** Put the magnet close to different objects. What happens?
- 3 Classify.** Which objects were pulled by the magnet? Which objects were not?

Explore More

- 4 Infer.** What kinds of objects do magnets pull?

You need



magnet



classroom objects

Step 2



Read Together and Learn

Vocabulary

magnet

poles

repel

What is a magnet?

Some things stick together with tape or glue. A magnet does not need those things to stick to something.

A **magnet** pulls, or attracts, some kinds of objects.



Which objects on the table will this magnet attract? ▼



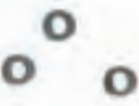





Magnets attract things that have iron in them. Iron is a kind of metal.

Magnets do not attract things that are made of plastic, rubber, or cloth.

 What kind of objects will a magnet attract?

Magnet Chart

My Magnet Chart	
Attracted	Not Attracted
 paper clip	 rubber bands
 washers	 googly eyes
 twist ties	 pom-poms

Read a Chart

Did the magnet attract rubber bands? Why or why not?



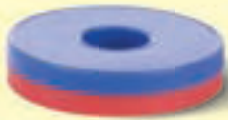
What are a magnet's poles?

Every magnet has two poles. **Poles** are where the magnet's pull is strongest. The **N** shows the north pole. The **S** shows the south pole.

If you hold the north pole of one magnet up to the south pole of another magnet, the poles will attract.

Quick Lab

See if a magnet can pull through paper, water, or your hand.



Magnets can be different shapes.



All magnets have a north pole and a south pole.



If you put two north poles or two south poles next to each other, they will repel one another. **Repel** means to push away.

These magnets have red north poles and blue south poles. ▶



- ✓ Why is there space between some magnets on this pencil?

Think, Talk, and Write

1. **Predict.** Can magnets pull through air, paper, water, and your hand?
2. Write or draw what happens when two like poles of a magnet are put together.

Social Studies Link

Find out some ways that people use magnets in your community.

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Fun with Magnets

Look at the picture below. Each car has a magnet at the end of it.



Write About It

Tell how the girl in this picture can use the magnets. Write a story about how you use magnets.

Remember

Tell what happens first, next, and last.



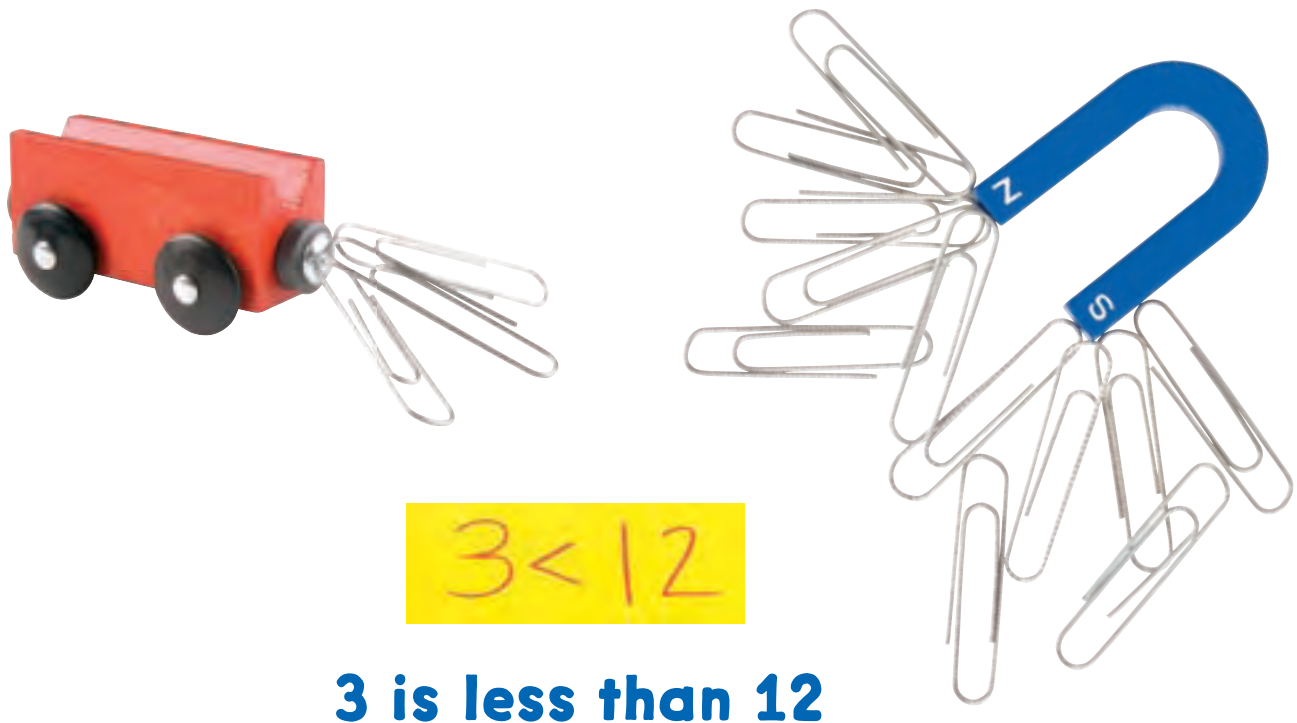
Write about it online at www.macmillanmh.com



PS-5. Explore the effects some objects have on others even when the two objects might not touch (e.g., magnets). **ELA WA I.I.** Write simple stories with a beginning, middle and end that include descriptive words and details.

Comparing Magnets

Molly had two magnets. She wondered which one would pick up more paper clips. She compared the amounts.



Compare

Use two different magnets. See which one picks up more paper clips. Compare the amounts.

Remember

The $<$ symbol always points to the smaller number.



SI-6. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, timers and simple balances and other appropriate tools. **M NS I.16a.** Develop strategies for basic addition facts, such as counting all.

Lesson 4

Energy and Heat

Look and Wonder

We use the Sun's energy in many ways. What will the Sun's heat do to wet clothes?



PS-8. Recognize that the sun is an energy source that warms the land, air and water. **PS-9.** Describe that energy can be obtained from many sources in many ways (e.g., food, gasoline, electricity or batteries). **ST-4.** Explore ways people use energy to cook their food and warm their homes . . .

How can heat change things?

What to Do

- 1 Put butter, an ice cube, and crayons on two plates. Place one plate in a warm place and the other in a cool place.
- 2 **Predict.** What will happen to the objects on each plate?
- 3 **Observe.** Wait ten minutes. How have the objects changed?
- 4 **Draw Conclusions.** What made the objects change?

Explore More

- 5 **Investigate.** Wait two hours. Check the objects. Have they changed?

You need



plastic plates



butter



ice cube



crayons



Read Together and Learn

Vocabulary

energy

heat



Explore energy
from the Sun with
the Junior Rangers.

What is energy?

When you eat food, you get energy to work and play.

Energy makes things work and change. There are many different forms of energy.



▲ Gasoline gives cars energy to move.

◀ Satellite dishes send energy from space to make pictures on TVs.

Heat, light, sound, and electricity are some forms of energy.

We use different forms of energy every day.

Quick Lab

Use energy from the Sun to blow up a balloon.

✓ Where do we get energy?



▲ Windmills turn energy from wind into electricity.



▲ Electrical energy can make lights work.

What is heat?

Heat is energy that makes things warm. We can get heat from burning things like wood, oil, or gas.

People can use this energy to warm their homes.



▲ Most of the heat energy on Earth comes from the Sun.

Heat Energy



Read a Photo

What happens when wood burns?

LOG
ON

Science in Motion Watch what heat can do
at www.macmillanmh.com

People also use heat to cook.

Rubbing things together is a source of heat, too. You can feel the heat when you rub your hands together.



▲ Heat popcorn kernels and they will pop!

✓ What is heat?

Rub your hands together.
Friction makes heat. ►



Think, Talk, and Write

1. **Main Idea and Details.** What are some different ways we get heat?

2. Write about some ways we use energy.

Social Studies Link

How do you use heat where you live?

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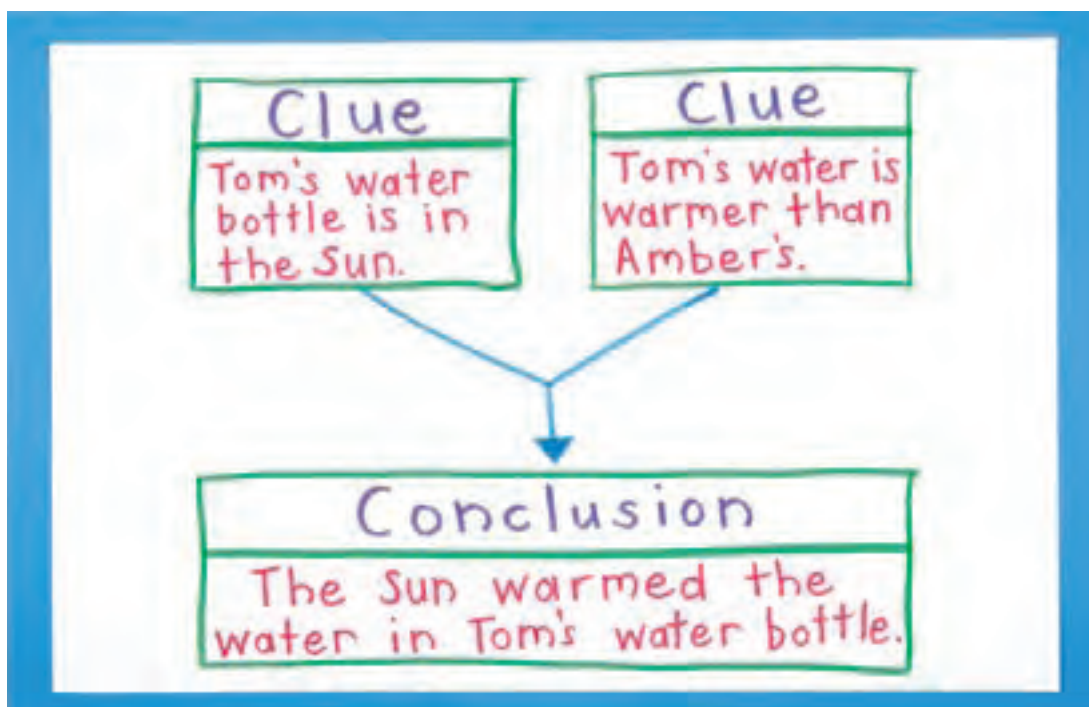
Focus on Skills

Inquiry Skill: **Draw Conclusions**

When you **draw conclusions**, you use what you observe to explain what happens.

► **Learn It**


Tom put his water bottle in the Sun. Amber put hers in the shade. Tom's water got warmer than Amber's. They concluded that Tom's water was heated by the Sun.



► Try It

1. Rub your hands together 10 times.
What do you notice?



2. What do you think would happen if you rubbed your hands together 20 times? Why?
3.  Make a chart like Tom and Amber's. Tell what happens when you rub your hands together.



Lesson 5

Electricity

Look and Wonder

What do you think makes these lights and rides work?



Explore

Inquiry Activity

What do some things need to work?

What to Do

- 1 Observe.** Try to turn on a flashlight with no batteries. What happens?
- 2 Investigate.** Put batteries in a flashlight. Turn it on.
- 3 Draw Conclusions.** What makes the flashlight work?

Explore More

- 4 Infer.** Do all things need batteries to work? What makes a lamp work?

You need



flashlight



batteries

Step 2



SWK-2. Demonstrate good explanations based on evidence from investigations and observations.

Read Together and Learn

Vocabulary

electricity

How do you use electricity?

Electricity is a form of energy. It gives some things power to work.

Wires carry electricity into your school and home. You can also get electricity from batteries.

Plugged In



Without electricity, many things we use every day would not work.

Some electrical things can be dangerous. Never use electricity near water.

- ✓ What things do you use that need electricity to work?

Quick Lab

Find things in your school that use electricity.



Read a Diagram

Which objects in this room need electricity to work?

Think, Talk, and Write

- 1. Problem and Solution.** You need to conserve electricity. How can you use less electricity at home?
- 2.** Write about how fans use electricity to work.

Math Link

Compare how many objects use wires or batteries to work in your home.

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Electricity at Home

Many kitchen appliances, like mixers, need electricity to work. They can make work easier. How do you think the electric mixer makes cooking easier for this family?



Write About It

Write a story about how this family could make dinner without an electric mixer.

Remember

A story has a clear beginning, middle, and end.





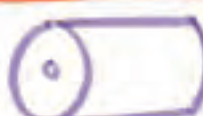
Journal Write about it online at www.macmillanmh.com



ST-4. Explore ways people use energy to cook their food and warm their homes (e.g., wood, coal, natural gas and electricity). **ELA WA I.2.** Write responses to stories that include simple judgments about the text.

Battery Chart

Sally did an experiment to find out which battery lasted the longest. She recorded her results in the chart below.

My Batteries	
Battery	Hours
A 	10 hours
B 	15 hours
C 	7 hours



Read a Chart

Which battery lasted the longest? How many more hours did battery B last than battery A? How do you know?

Remember

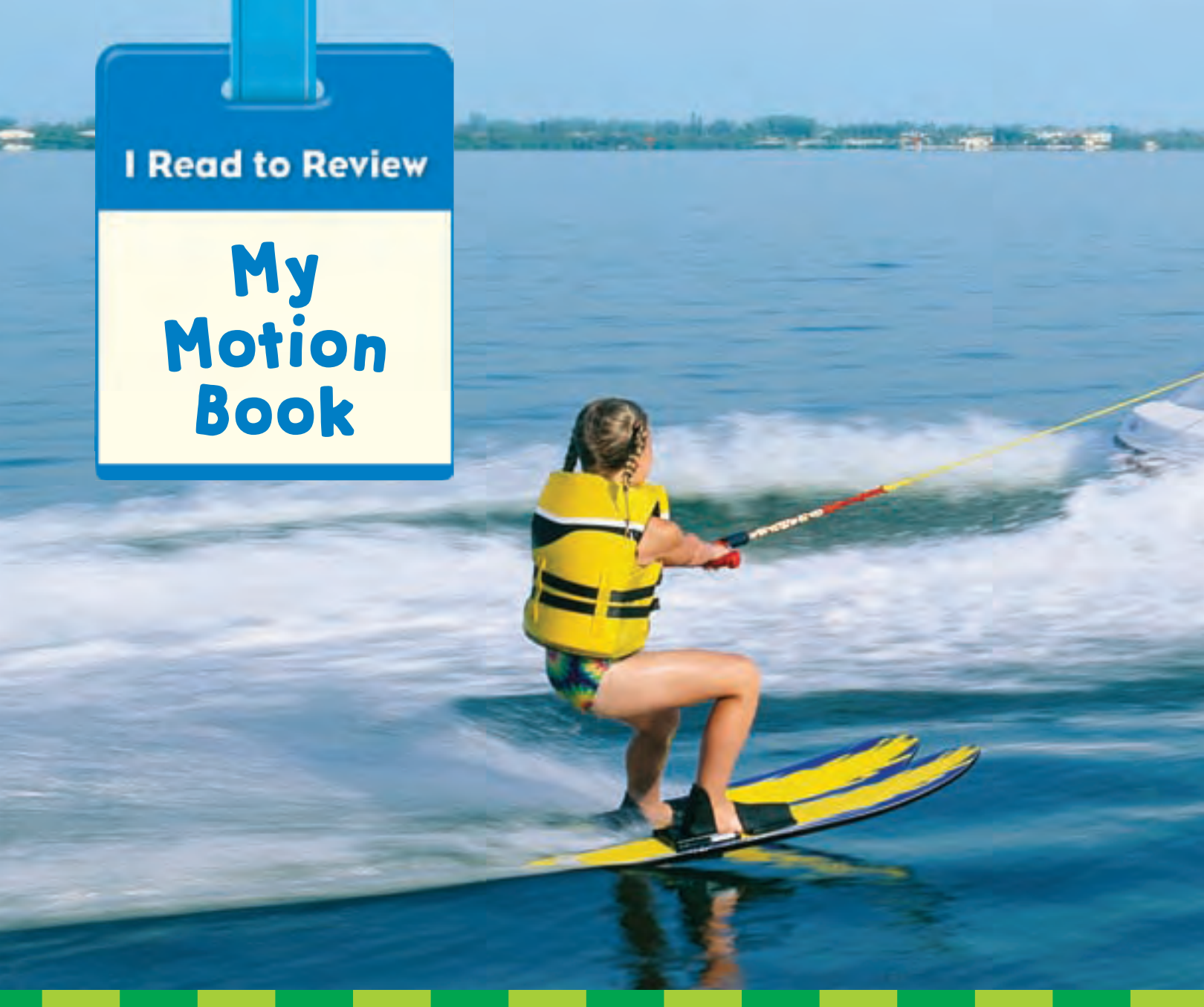
Subtract the smaller number from the larger one to find the difference.



SI-7. Make estimates to compare familiar lengths, weights and time intervals.
M DAP I.4. Read and interpret charts, picture graphs and bar graphs as sources of information to identify main ideas, draw conclusions, and make predictions.

I Read to Review

My Motion Book



Many things can move
with a little force.



A push or a pull
can change your course.



Magnets can move
some metal things around.



Gravity pulls things
to the ground.

CHAPTER 7 Review

Vocabulary

Use each word once to complete the sentences.

1. An object's movement from one place to another is called _____.

PS-6

2. You need _____ to make a computer work.

PS-9

3. When an object is moving, its _____ changes.

PS-6

4. When the two north poles of magnets face each other, they _____.

PS-5

5. Objects made of iron will be attracted to a _____.

PS-1

electricity

magnet

motion

position

repel



Answer the questions below.

6. Use position words to describe where the clowns are in the picture below.

SI-9



7. **Infer.** What will happen if this girl drags her rollerblades' rubber stopper on the ground? Why?

PS-6



8. **Summarize.** Where can we get heat?

PS-8



9. How can you make things move?

PS-6



Literature

Poem

FOR A QUICK



EXIT

by Norma Farber

For going up or coming down,
in big department stores in town,
you take an escalator.
(They come in pairs.)
Or else an elevator.
(Also stairs.)

I wish storekeepers would provide
a **SLIDE!**



Talk About It

What are some ways
to get from one floor to
another in a building?

Careers in Science

Baker

Do you love to make cookies? You could become a baker. A baker makes breads, cookies, cakes, and other foods to sell. Some bakers have their own bakery. Others work for big companies.

You must understand the science of baking to become a baker. Bakers learn that when different foods are mixed, they can change.



baker

More Careers to Think About



chemist



cement truck operator

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Science Handbook

Nonstandard Measurement	R2
Standard Measurement	R3
Measure Volume	R4
Measure Mass	R4
Measure Time	R5
Measure Temperature	R5
Use a Computer	R6
Use a Hand Lens	R6
Use a Bar Graph	R7

Health Handbook

Your Body	R8
Healthful Foods	RI2
Healthy Living	RI4
Safety	RI6

Glossary	RI9
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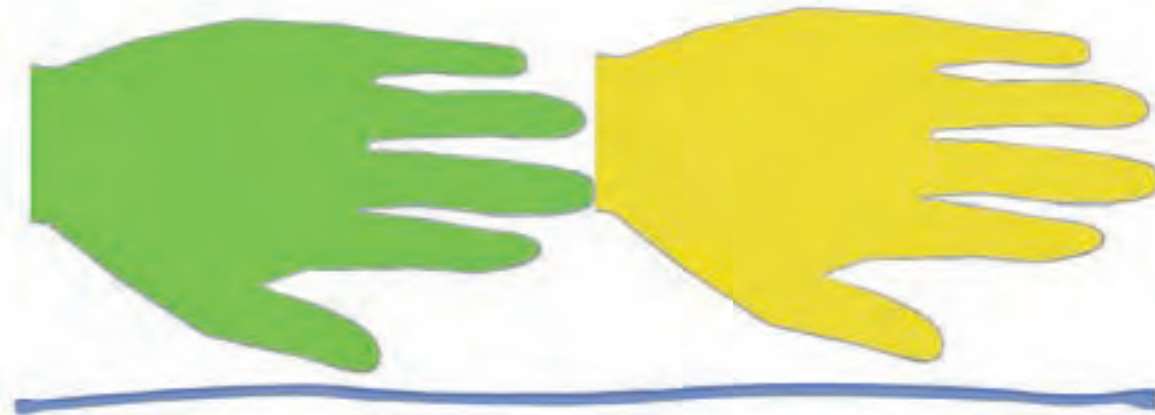
Measurements

Nonstandard

You can use objects to measure the length of some solids. Line up objects and count them. Use objects that are alike. They must be the same size.



▲ This string is about 8 paper clips long.



▲ This string is about 2 hands long.

Try It

Measure a solid in your classroom.
Tell how you did it.

Standard

You can also use a ruler to measure the length of some solids. You can measure in a unit called **centimeters**.



You can also use a ruler to measure in a unit called **inches**. One inch is longer than 1 centimeter.



Try It

Estimate the length of this toy car. Then find its exact length.



Measurements

Volume

You can measure the volume of a liquid with a **measuring cup**. Volume is the amount of space a liquid takes up.



▲ This measuring cup has 1 cup of liquid.

Mass

You can measure mass with a **balance**. The side that has the object with more mass will go down.



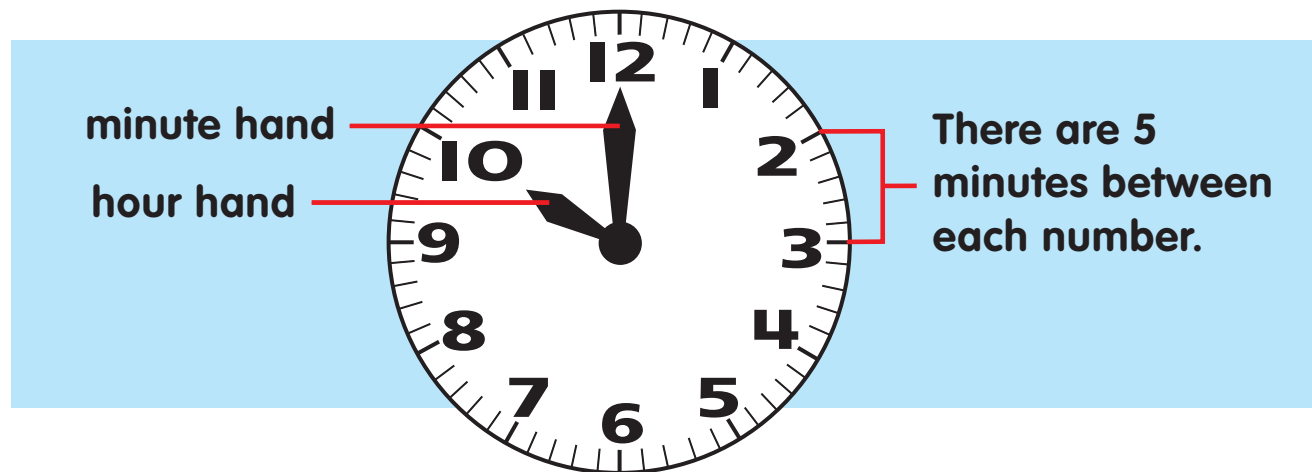
▲ Before you compare the mass of two objects, be sure the arrow points to the line.

Try It

Place two objects on a balance. Which has more mass?

Time

You can measure time with a **clock**.
A clock measures in units called hours, minutes, and seconds. There are 60 minutes in 1 hour.



Temperature

You can measure temperature with a **thermometer**.
Thermometers measure in units called degrees.

Try It

Use a thermometer to find the temperature outside today.

Degrees Fahrenheit



Degrees Celsius

◀ The temperature is 85 degrees Fahrenheit.

Science Tools

Computer

A computer is a tool that can help you get information. You can use the Internet to connect to other computers around the world.

When you use a computer, make sure an adult knows what you are working on.



Hand Lens

A hand lens is another tool that can help you get information. A hand lens makes objects seem larger.



Try It

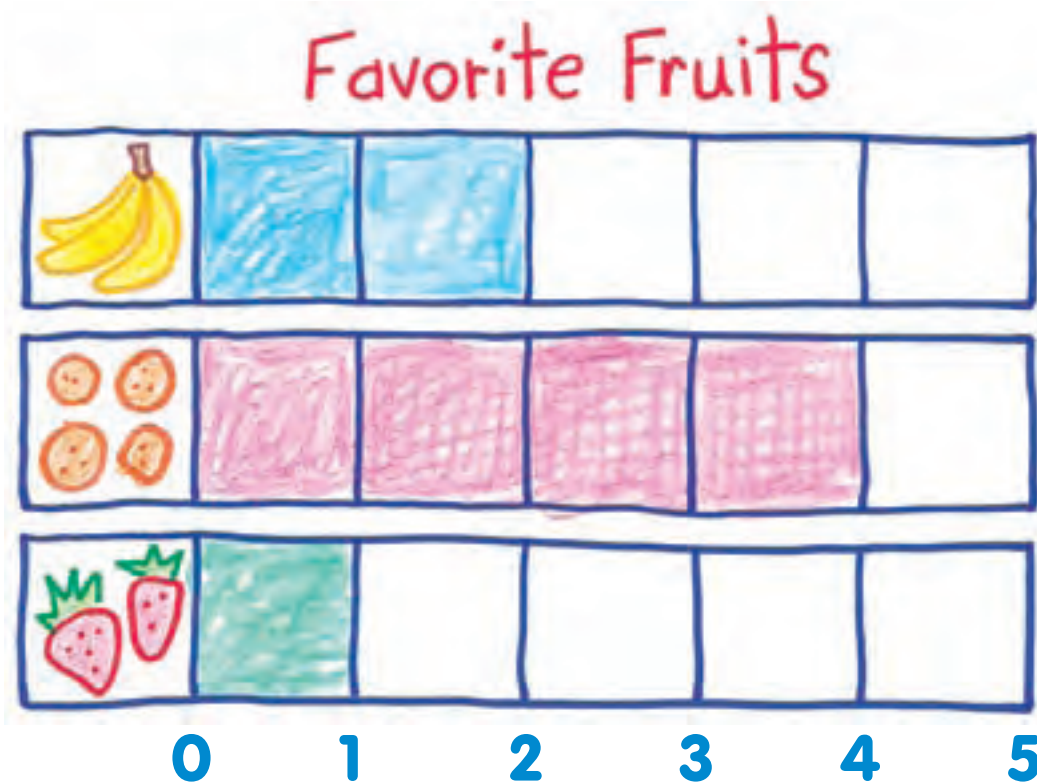
Use a hand lens to look at an object. Draw what you see.



Graphs

Bar Graphs

Bar graphs organize data. The title of the graph tells you what the data is about. The shaded bars tell you how much of each thing there is.



Try It

Make a bar graph that shows your classmates' favorite fruits.



Skeletal System

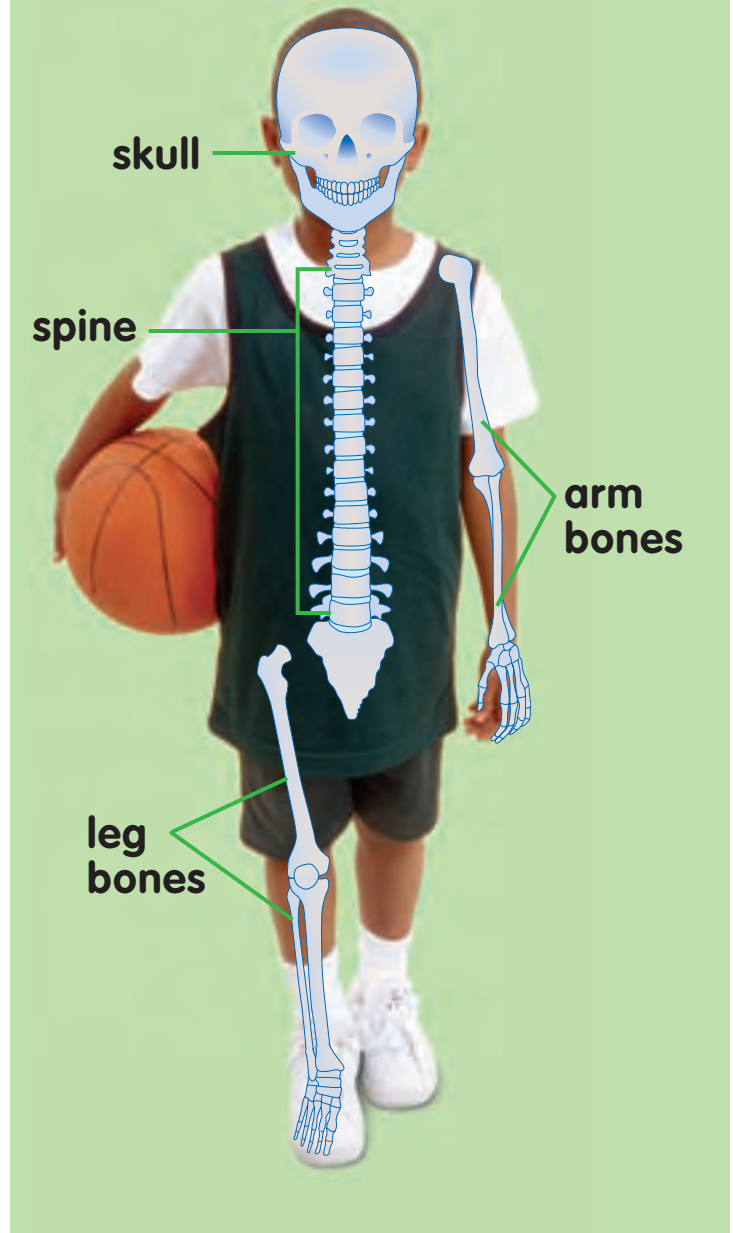
Your body has many parts. All your parts work together to help you live.

Bones are hard body parts inside your body. They help you stand straight. Your bones give your body its shape.

Try It

How many bones do you think there are in your arms? Count them.

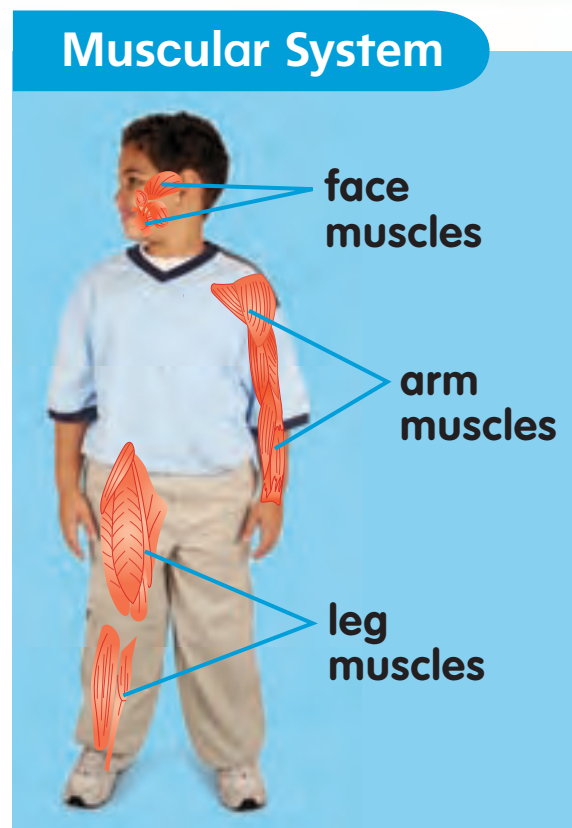
Skeletal System



Muscular System

Muscles are body parts that help you move. They are inside your body.

Muscles get stronger when you exercise them.



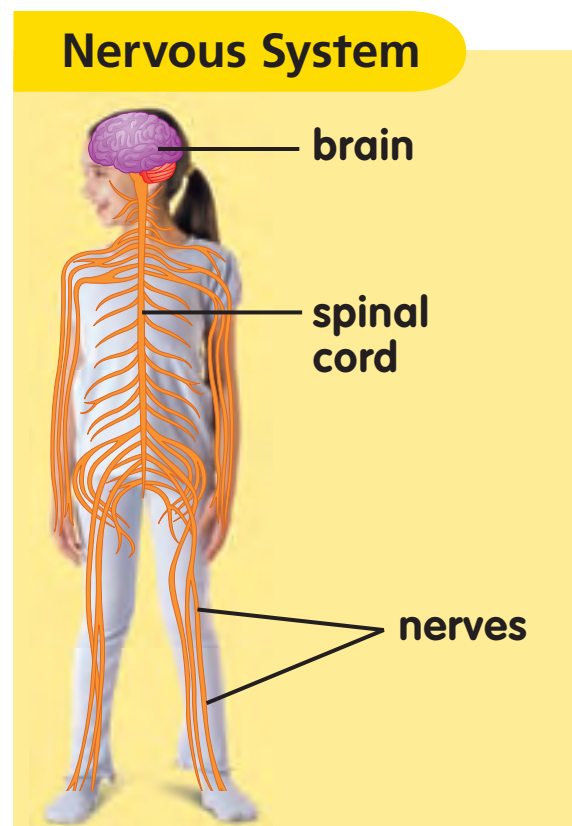
Nervous System

Your brain sends messages all around your body. The messages travel along tiny body parts called nerves.

These messages tell your body parts to move. They can also alert you of danger.

Try It

Jump up and down in place. Which muscles did you use?



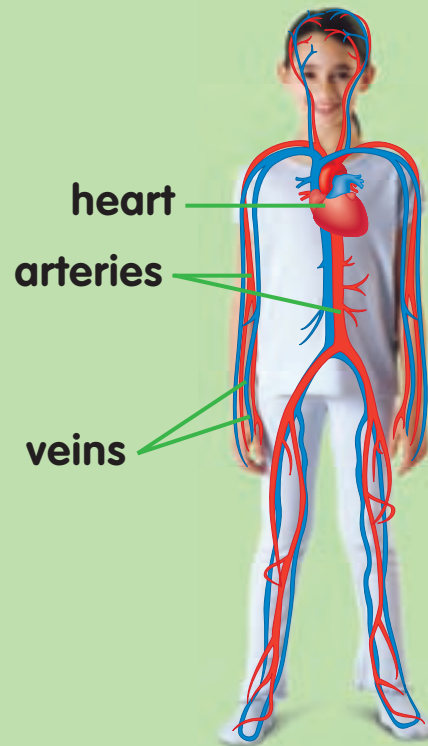
Your Body

Circulatory System

Blood travels through your body. Your heart pumps this blood through blood vessels.

Blood vessels are tubes that carry blood inside your body. Arteries and veins are blood vessels.

Circulatory System



Respiratory System

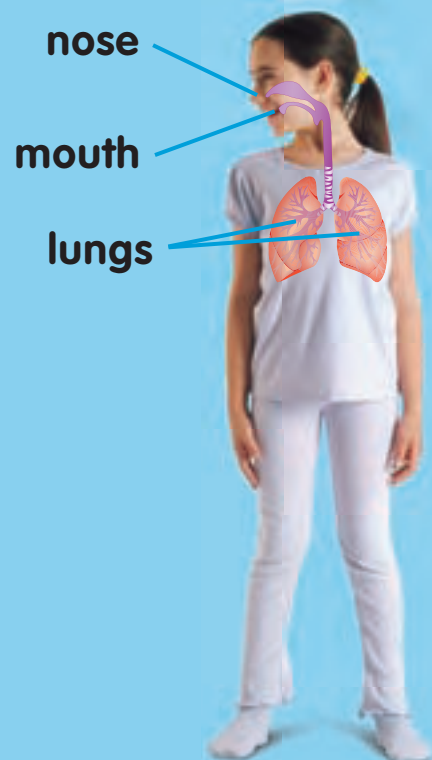
Your mouth and nose take in the oxygen you need from the air.

The oxygen goes into your lungs and travels through your blood.

Try It

Count how many breaths you take in 1 minute. Do ten jumping jacks. Count again.

Respiratory System

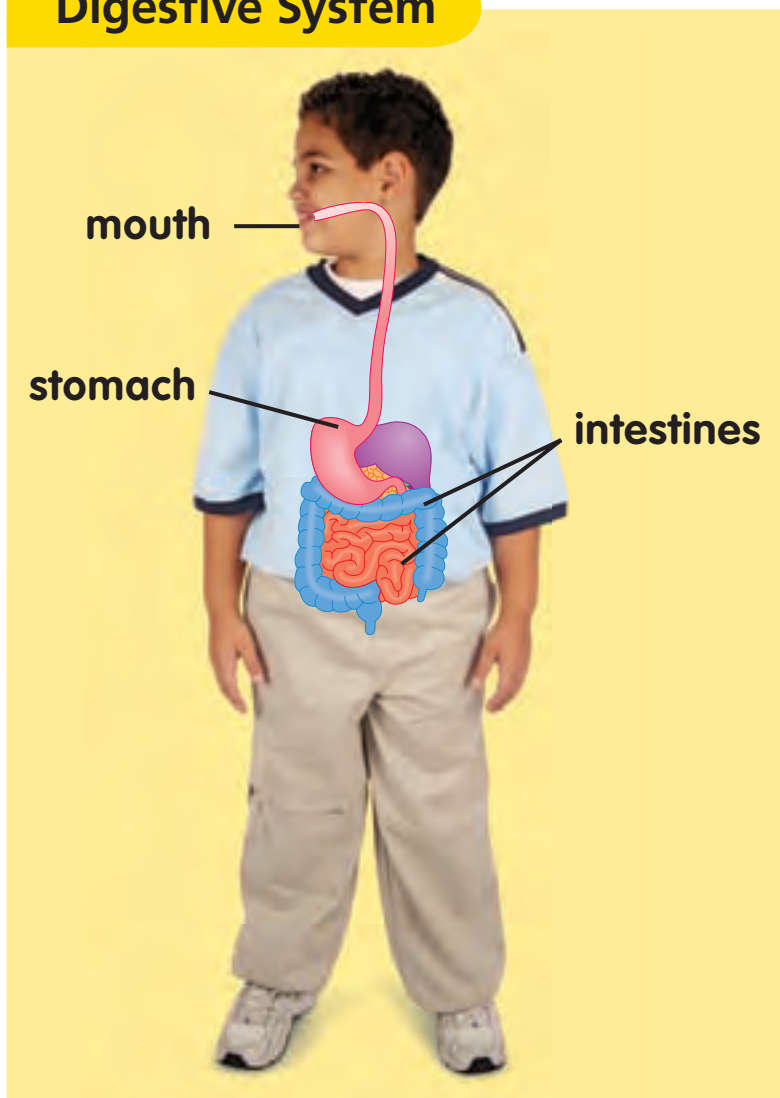


Digestive System

When you eat, your body uses food for energy.

Food enters your body through your mouth. Your stomach and intestines help break down the food in your body. This helps your body get nutrients.

Digestive System



Try It

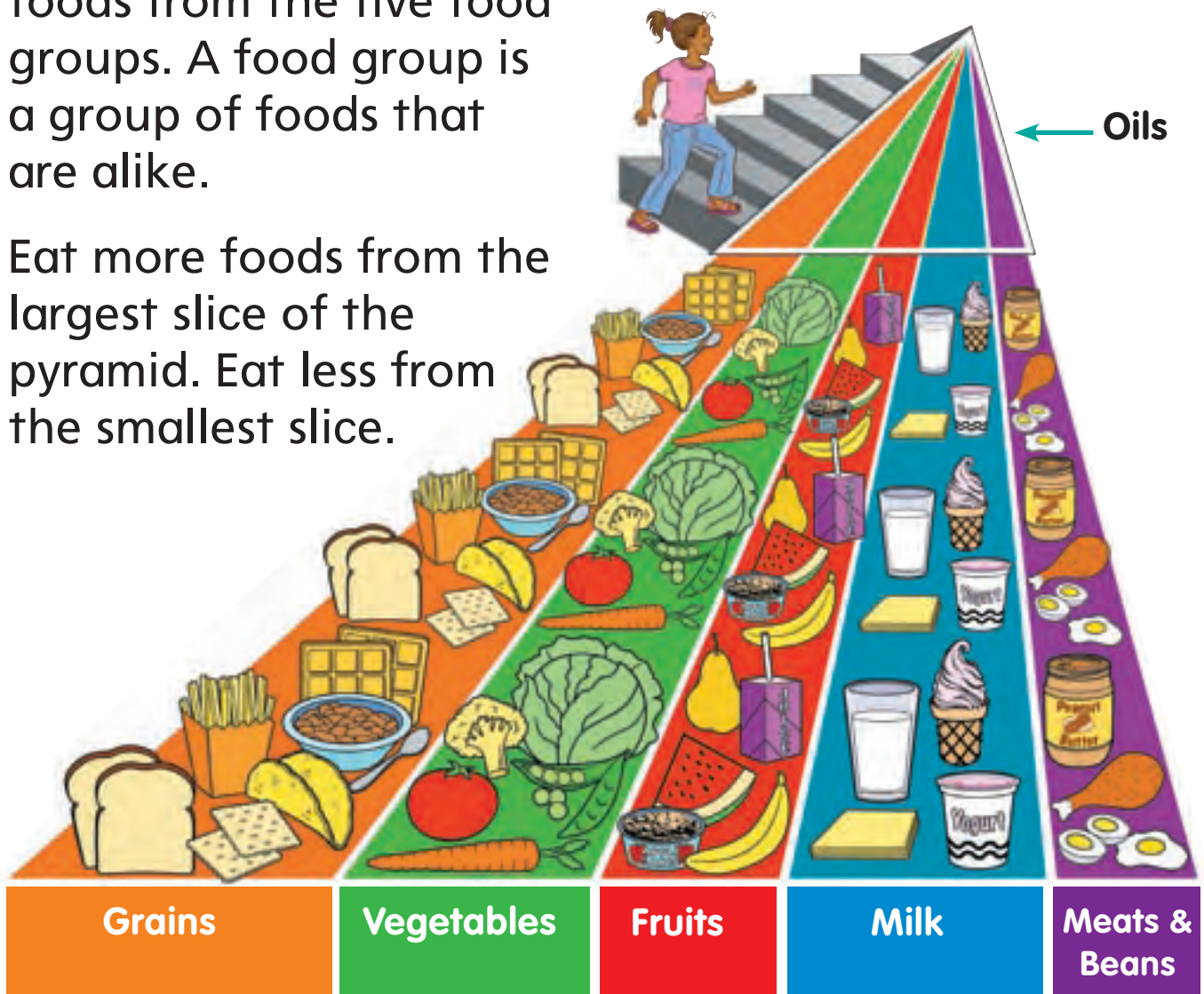
Name some body parts that help you eat food.

Healthful Foods

MyPyramid

MyPyramid is a guide for healthful eating. A healthful meal contains foods from the five food groups. A food group is a group of foods that are alike.

Eat more foods from the largest slice of the pyramid. Eat less from the smallest slice.



Try It

Plan a healthful meal. Include one food from each group.

Healthful Foods

Foods can come from plants or animals. Grains, fruits, and vegetables give you energy to work and play. Foods in the milk group keep your bones strong. Meats, fish, and beans help make your muscles strong.



Where Foods Come From	
Foods from plants	Foods from animals
 bread	 egg
 carrots	 milk
 beans	 meat

Try It

Write down what you ate for breakfast. Where did the foods come from?



Healthy Living

Stay Healthy

Be active every day. Exercise keeps your heart and lungs healthy.

Doctors and dentists can help you stay healthy as you grow.



▲ Exercise is important for a healthy body.



▲ Get a checkup from a doctor and dentist every year.

Try It

Record how many times you exercise in one week.

Take Care of Your Body

Tobacco and alcohol harm you. Tobacco smoke can make it hard to breathe. Alcohol slows down your mind and body.

Here are some ways to take care of your body. ▼



▲ Only take medicines that your parent or doctor gives you.



Try It

Make a poster about being drug free. Share it with your school.

Safety Indoors

To stay safe indoors, do not touch dangerous things. Tell an adult about them right away. Never taste anything without permission.

In case of a fire, get out fast. If your clothes catch fire, remember to stop, drop, and roll.

Try It

Practice stop, drop, and roll. Teach it to a friend.



▲ Do not touch these things.



stop



drop



roll

Safety Outdoors

Be safe outdoors. Follow these rules.



▲ Wear a helmet.



▲ Cross at a crosswalk.



▲ Wear your seat belt.



▲ Follow game rules.

Try It

Choose one of the rules. Make a poster showing the safety rule.

Safety

Get Along

Work and play well with others. Show others respect and care. Be fair and take turns when playing with one another.



Try It

Make a friendship badge.
Give your badge to someone who is being a good friend.

Glossary

A

amphibian An animal that lives on land and in water. (page 71) A frog is an amphibian.



B

balance A tool used to measure mass. (page 214) The side of a balance with more mass will go down.



bird An animal that has two legs, two wings, and feathers. (page 69) A duck is a bird.



burn A way of changing matter using heat. (page 220) When you burn paper, it changes to ash.



C

carnivore An animal that eats other animals. (page 88) A tiger is a carnivore.



conserve To save, keep, or protect.
(page 164) You can conserve resources
by not wasting them.



continent A large piece of land on
Earth. (page 110) There are seven
continents on Earth.



D

dissolve To completely mix into a
liquid. (page 228) Drink mix will
dissolve in water.



E

electricity A form of energy that
gives some things the power to work.
(page 282) Many things in your home
need electricity to work.



energy A force that makes things work
or change. (page 274) Gasoline gives
cars the energy to move.



erosion When rock and soil are moved by wind or water to a new place. (page 132) Erosion slowly changes the shape of land.



evaporate To change from a liquid to a gas. (page 236) Heat from the Sun made the water in this pond evaporate.



F

fall The season after summer. (page 188) Some leaves change colors in fall.



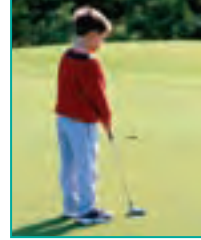
fish An animal that lives in water and has gills and fins. (page 72) Fish use gills to breathe in water.



flower A part of a plant that makes seeds. (page 52) Flowers come in many shapes and colors.



force A push or a pull that makes an object move. (page 258) It takes force, like a push, to move a ball.



freeze To change from a liquid to a solid. (page 234) Water will freeze if it gets very cold.



friction A force that slows things down. (page 261) If you drag a rubber stopper on the ground, friction makes you stop.



fruit The plant part that holds the seeds. (page 53) The peach fruit has a seed inside.



G

gills The part of a fish that takes in oxygen from water. (page 81) A fish uses its gills to breathe in water.



gravity A force that pulls things toward Earth. (page 259) Gravity keeps us from staying up in the air.



H

heat A form of energy that makes things warm. (page 276) Heat can make popcorn pop.



herbivore An animal that eats plants. (page 87) A rabbit is a herbivore.



I

insect An animal with three body parts and six legs. (page 73) An ant is an insect.



L

leaves Plant parts that use sunlight and air to make food. (page 38) Leaves come in different shapes and sizes.



living Something that grows, changes, and needs food, air, and water to survive. (page 28) This girl is a living thing.



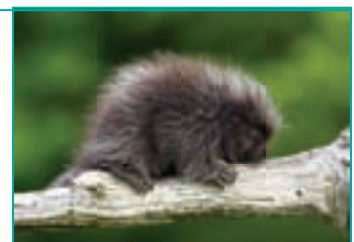
lungs Body parts used to breathe air. (page 81) Birds use lungs to breathe.



magnet Something that can pull, or attract, some objects with metal in them. (page 266) A magnet can attract metal paper clips.



mammal An animal with hair or fur. (page 68) Most mammals give birth to live young.



mass The amount of matter in an object. (page 214) A metal bird has more mass than a sponge bird.



matter What all things are made of. (page 213) A kite is made of matter.



melt To change from a solid to a liquid. (page 235) Ice cubes can melt and become water.



mineral A nonliving thing from the earth. (page 121) All rocks are made of minerals.



mixture Two or more different things put together. (page 226) A fruit salad is a mixture of different fruits.



motion A change in an object's position. (page 252) The airplane is in motion.



mountain Land that is very high.
(page 114) A mountain is the highest
type of land.



N

natural resource Something that comes
from Earth that people use. (page 146)
Rocks are a natural resource.



nonliving Something that does not
grow and change, or need food, air,
or water to survive. (page 29) A rock
is a nonliving thing.



nutrient Something that living things
need to grow. (page 30) Plant roots can
get nutrients from soil.



P

plain Flat land that spreads out a
long way. (page 115) A plain is wide
and flat.



poles The places where a magnet's pull is strongest. (page 268) A magnet has a North pole and a South pole.



pollution Harmful things in the air, land, or water. (page 158) Water pollution can harm animals.



position The place where something is located. (page 250) You can find something if you know its position.



property How something looks, feels, smells, tastes, or sounds. (page 212) Color is a property of the puppets.



pull A force that moves something closer to you. (page 258) The boy pulls the bag of basketballs.



push A force that moves something away from you. (page 258) The girl pushes the basketball when she throws it.



R

recycle To make a new thing from an old thing. (page 167) You can recycle paper, plastic, and glass.



reduce To use less of something. (page 166) You can reduce how much water you use by turning the water off when brushing your teeth.



repel To push away. (page 269) Alike poles on magnets will repel each other.



reptile An animal that has dry skin covered with scales. (page 70) A snake is a reptile.



reuse To use something again. (page 164) You can reuse cans and bottles.



river Fresh water that moves. (page 113)
A river may flow into an ocean.



root Plant part that keeps the plant in the ground. (page 38) Roots hold a plant in the ground.



S

season A time of year. (page 180)
Fall, winter, spring, and summer are the four seasons.



seed A part of a plant that can grow into a new plant. (page 52) A seed inside a peach can grow into a peach tree.



shelter A place where animals can live and be safe. (page 79) These raccoons find shelter in a log.



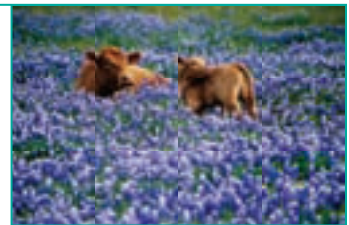
soil The top layer of Earth. (page 122) Soil is a mixture of tiny bits of rock, air, water, dead plants, and dead animals.



speed How fast or slow something moves. (page 253) A rocket ship can move at a fast speed.



spring The season after winter. (page 180) Many baby animals are born in spring.



stem The part of a plant that holds up the plant. (page 38) The stem holds up the flower.



summer The season after spring.
(page 182) Lemonade can cool you
off in the hot summer.



T

trunk The thick stem of a tree.
(page 45) A trunk helps protect a tree
from weather and animals.



V

valley Low land between mountains.
(page 114) The valley is flat.

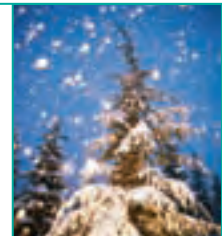


W

weathering When water changes the
shape and size of rocks. (page 128)
Weathering can make rocks crack.

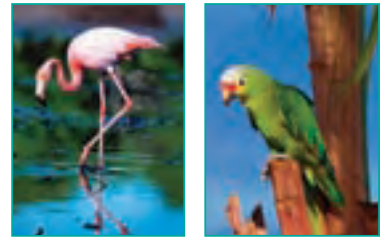


winter The season after fall.
(page 190) It can snow in winter.

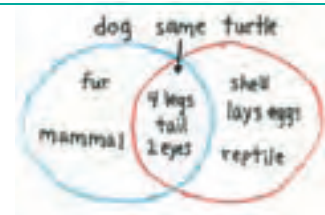


Science Skills

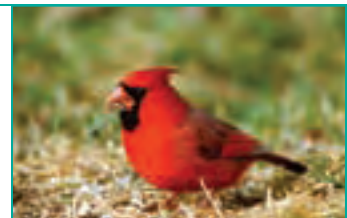
classify To group things by how they are alike. (chapter 1) You can classify these animals as birds because they have feathers.



compare To observe how things are alike or different. (chapter 2) You can use a Venn diagram to compare two things.



draw conclusions To use what you observe to explain what happens. (chapter 7) You can draw the conclusion that the bird was hungry because it ate all the sunflower seeds.



infer To use what you know to figure something out. (chapter 7) Since there are not many plants to eat in winter, you can infer that the bird does not have a lot of food.



investigate To make a plan and try it out. (chapter 4) You can investigate to find out what snails eat.



make a model To make something to show how something looks or works. (chapter 3) You can make a model to show how a river flows into a lake.



measure To find out how far something moves, or how long, how much, or how warm something is. (chapter 6) You can use a thermometer to measure temperature.



Science Content Standards

Ohio Science Indicators

Life Sciences

- LS-1. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter.
- LS-2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests).
- LS-3. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry (e.g., sharp teeth, flat teeth, good nose and sharp vision).
- LS-4. Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.
- LS-5. Recognize that seasonal changes can influence the health, survival or activities of organisms.

Earth and Space Sciences

- ESS-1. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment and that resources are necessary to meet the needs and wants of a population.
- ESS-2. Explain that the supply of many resources is limited but the supply can be extended through careful use, decreased use, reusing and/or recycling.
- ESS-3. Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks).

Physical Sciences

- PS-1. Classify objects according to the materials they are made of and their physical properties.
- PS-2. Investigate that water can change from liquid to solid or solid to liquid.
- PS-3. Explore and observe that things can be done to materials to change their properties (e.g., heating, freezing, mixing, cutting, wetting, dissolving, bending and exposing to light).

- PS-4. Explore changes that greatly change the properties of an object (e.g., burning paper) and changes that leave the properties largely unchanged (e.g., tearing paper).
- PS-5. Explore the effects some objects have on others even when the two objects might not touch (e.g., magnets).
- PS-6. Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop.
- PS-7. Explore how energy makes things work (e.g., batteries in a toy and electricity turning fan blades).
- PS-8. Recognize that the sun is an energy source that warms the land, air and water.
- PS-9. Describe that energy can be obtained from many sources in many ways (e.g., food, gasoline, electricity or batteries).

Science and Technology

- ST-1. Explore that some kinds of materials are better suited than others for making something new (e.g., the building materials used in the *Three Little Pigs*).
- ST-2. Explain that when trying to build something or get something to work better, it helps to follow directions and ask someone who has done it before.
- ST-3. Identify some materials that can be saved for community recycling projects (e.g., newspapers, glass and aluminum).
- ST-4. Explore ways people use energy to cook their food and warm their homes (e.g., wood, coal, natural gas and electricity).
- ST-5. Identify how people can save energy by turning things off when they are not using them (e.g., lights and motors).
- ST-6. Investigate that tools are used to help make things and some things cannot be made without tools.
- ST-7. Explore that several steps are usually needed to make things (e.g., building with blocks).
- ST-8. Investigate that when parts are put together they can do things that they could not do by themselves (e.g., blocks, gears and wheels).

Scientific Inquiry

- SI-1.** Ask “what happens when” questions.
- SI-2.** Explore and pursue student-generated “what happens when” questions.
- SI-3.** Use appropriate safety procedures when completing scientific investigations.
- SI-4.** Work in a small group to complete an investigation and then share findings with others.
- SI-5.** Create individual conclusions about group findings.
- SI-6.** Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, timers and simple balances and other appropriate tools).
- SI-7.** Make estimates to compare familiar lengths, weights and time intervals.
- SI-8.** Use oral, written and pictorial representation to communicate work.
- SI-9.** Describe things as accurately as possible and compare with the observations of others.

Scientific Ways of Knowing

- SWK-1.** Discover that when a science investigation is done the same way multiple times, one can expect to get very similar results each time it is performed.
- SWK-2.** Demonstrate good explanations based on evidence from investigations and observations.
- SWK-3.** Explain that everybody can do science, invent things and have scientific ideas no matter where they live.

Science Content Standards

Ohio Science Benchmarks – Grades K-2

Life Sciences

- A. Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms).
- B. Explain how organisms function and interact with their physical environment.
- C. Describe similarities and differences that exist among individuals of the same kind of plants and animals.

Earth and Space Sciences

- A. Observe constant and changing patterns of objects in the day and night sky.
- B. Explain that living things cause changes on Earth.
- C. Observe, describe and measure changes in the weather, both long term and short term.
- D. Describe what resources are and recognize some are limited but can be extended through recycling or decreased use.

Physical Sciences

- A. Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change.
- B. Recognize that light, sound and objects move in different ways.
- C. Recognize sources of energy and their uses.

Science and Technology

- A. Explain why people, when building or making something, need to determine what it will be made of, how it will affect other people and the environment.
- B. Explain that to construct something requires planning, communication, problem solving and tools.

Scientific Inquiry

- A. Ask a testable question.
- B. Design and conduct a simple investigation to explore a question.
- C. Gather and communicate information from careful observations and simple investigation through a variety of methods.

Scientific Ways of Knowing

- A. Recognize that there are different ways to carry out scientific investigations. Realize that investigations can be repeated under the same conditions with similar results and may have different explanations.
- B. Recognize the importance of respect for all living things.
- C. Recognize that diverse groups of people contribute to our understanding of the natural world.

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