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Published by Macmillan/McGraw-Hill, of McGraw-Hill Education, a division of The McGraw-Hill Companies, Inc., Two Penn Plaza, New York, New York 10121.

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Printed in the United States of America

ISBN-13: 978-0-02-285992-3

ISBN-10: 0022859926

1 2 3 4 5 6 7 8 9 (079) 10 09 08 07 06

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CHAPTER 1

Plants and Their Needs



What are plants?

Vocabulary

plants living things that grow from seeds



energy what gives plants the power to do things



leaves parts of a plant that use sunlight and air to make food



roots parts of a plant that take in water from the soil

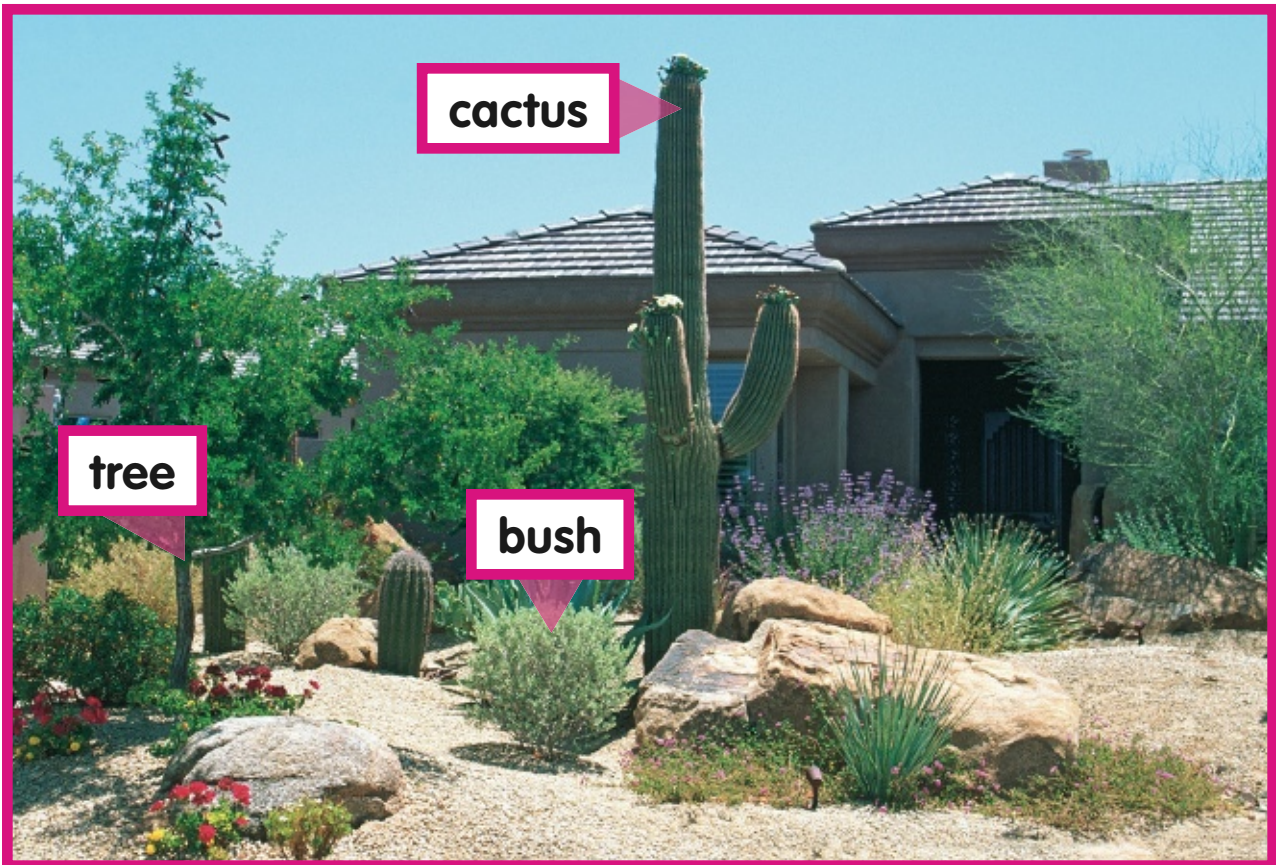


What are plants?

Plants are living things.

Living things grow and change.

Seeds from plants grow into new plants.



▲ Many people grow plants near their homes.

All plants do not look the same.



▲ Some plants have flowers.



▲ Some trees are very tall.

✓ Quick Check

Write the names of three plants.

I.

plants

Where do plants live?

Plants live all over Earth.

They have parts that help them live in different places.

Some plants live in the hot, dry desert.

They have thick skin and spines to help them live there.

desert



▲ These are desert plants.

It rains a lot in the rain forest.

Rain-forest plants have leaves that help them live in wet places.



▲ Rain-forest leaves grow large to get sunlight.



Quick Check

Name two places where plants live.

— — — — —

2. _____

— — — — —

3. _____

Do all plants need the same things to grow?

Plants need water, air, space, and sunlight to grow.

Some plants grow in warm places.



▲ Orange trees grow in warm places.

Some plants need a lot of water to grow.



◀ Rice plants grow in very wet places



Quick Check

List what plants need.

sunlight

4.

How do plants use sunlight?

Energy gives plants the power to do things.

Plants get energy from the Sun.



▲ Sunflowers need a lot of sunlight to grow.

Plants use sunlight to make the food they need.



forest

Forest plants need very little sunlight to grow.

Quick Check

Fill in the blanks.

5. Plants get _____
from the Sun.

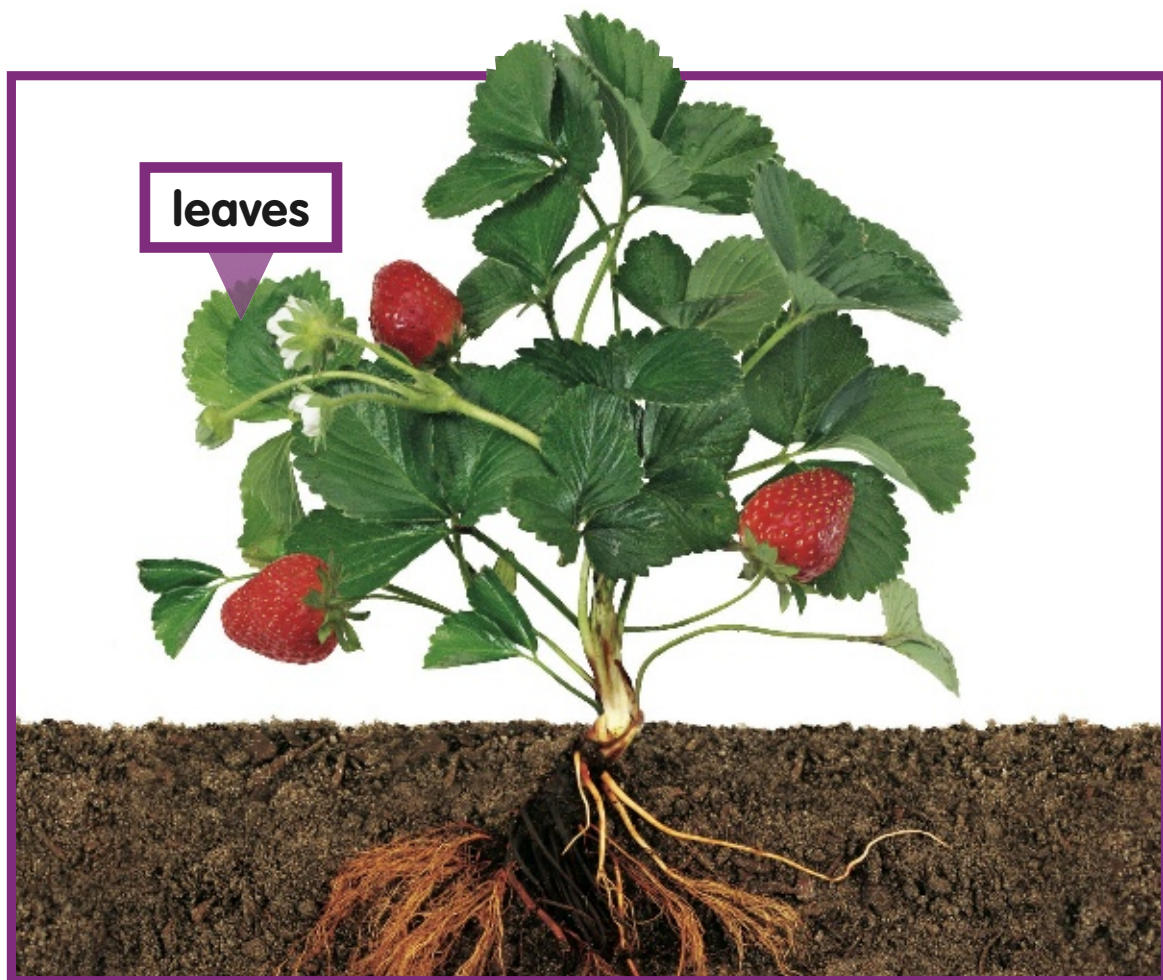
6. Plants use sunlight to make

_____.

What are the parts of a plant?

Leaves are parts of a plant.

Leaves use sunlight and air to make food.

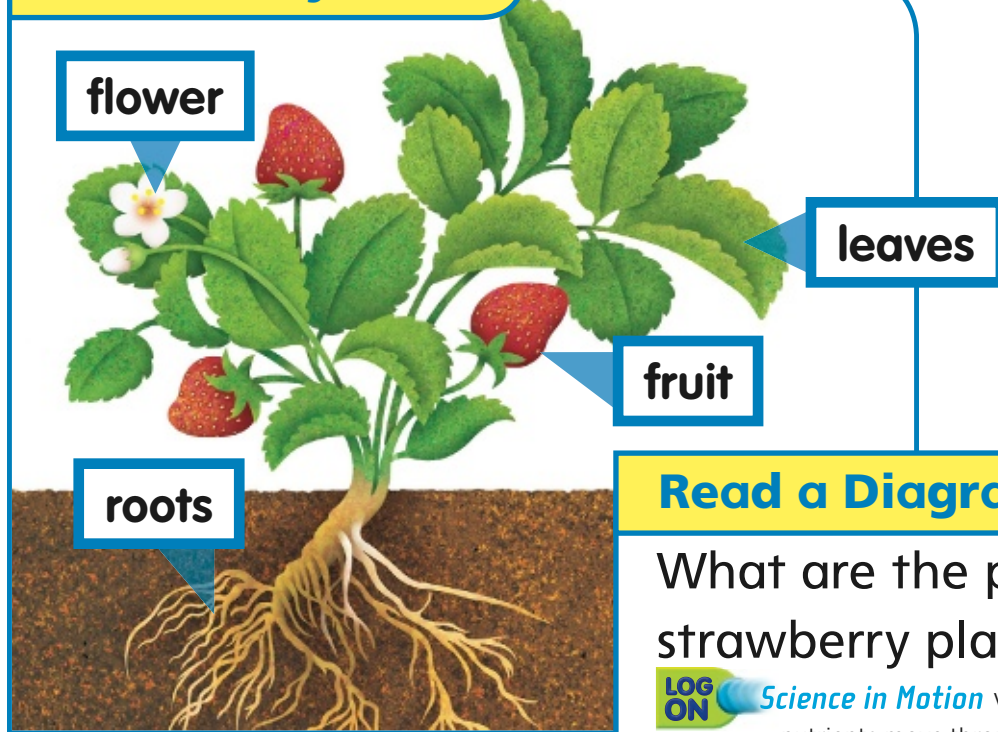


▲ This plant has green leaves.

Some plants have flowers.

Some flowers grow into fruit.

Strawberry Plant



Read a Diagram

What are the parts of a strawberry plant?



Science in Motion Watch how water and nutrients move through a plant @ www.macmillanmh.com



Quick Check

7. Draw a plant. Label the leaves.

What do roots do?

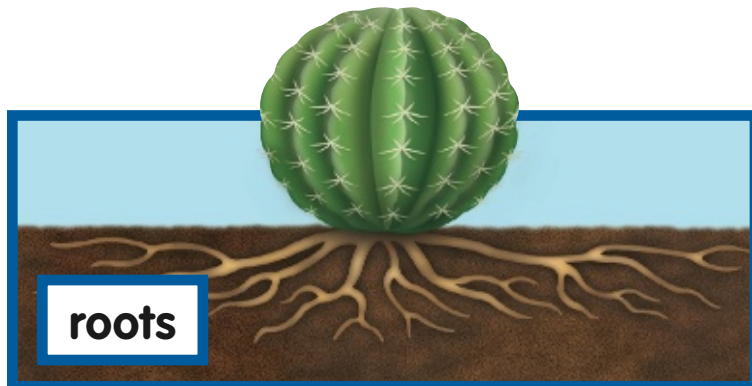
A plant's **roots** take in water from the soil.



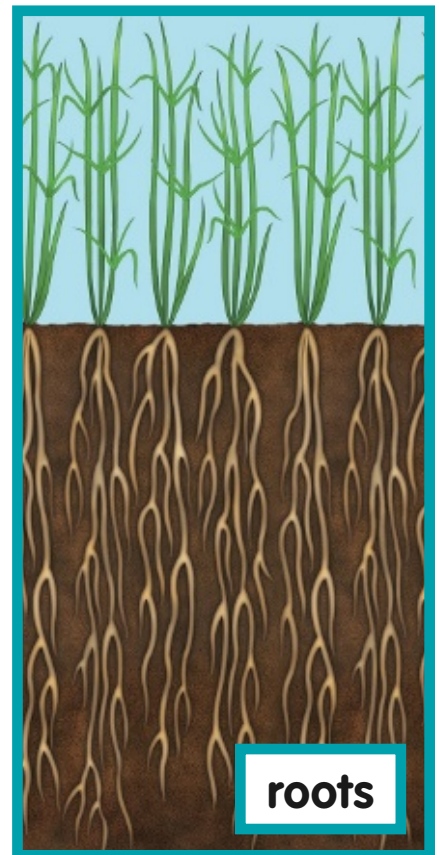
▲ Roots also help plants stay in the ground.

Some plants have long roots.

Other plants have roots that spread out.



▲ These roots are near the ground.



▲ These roots are long and deep.



Quick Check

Circle the answer.

8. Roots help plants stay in the _____.

sky ground

9. Roots get _____ from soil.

water air

Vocabulary Review

Use the words in the box to answer the questions.

energy

leaves

plants

roots

1. What gives plants the power to do things?

2. What plant parts get water from soil?

3. What living things grow from seeds?

4. What plant parts make food?

CHAPTER 2

Animals and Their Needs



What do you know about animals?

Vocabulary

mammals animals with hair or fur



birds animals that have feathers



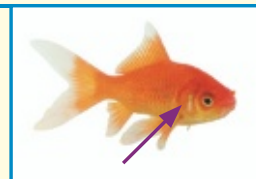
reptiles animals that have dry skin covered with scales



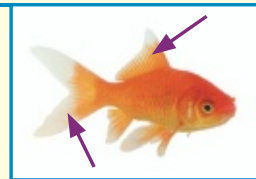
insects animals that have three body parts and six legs



gills help fish take in air from the water



fins help fish swim in water



What are some kinds of animals?

There are many kinds of animals.

Animals have different body coverings to help them live.



▲ Fur keeps otters warm and dry in cold water.

Mammals are animals with hair or fur.

Birds are animals with feathers.



▲ A horse is a mammal.



▲ A duck is a bird.

✓ **Quick Check**

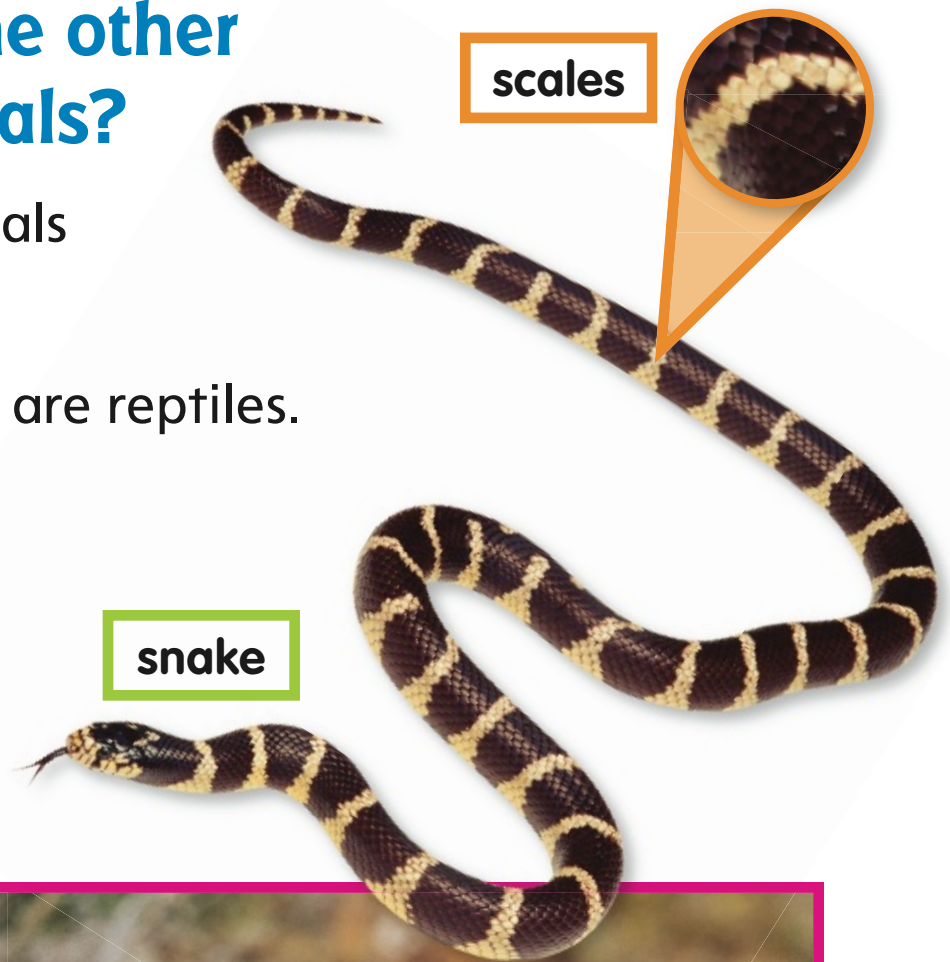
1. Name a mammal.

2. Name a bird.

What are some other kinds of animals?

Reptiles are animals that have scales.

Snakes and lizards are reptiles.



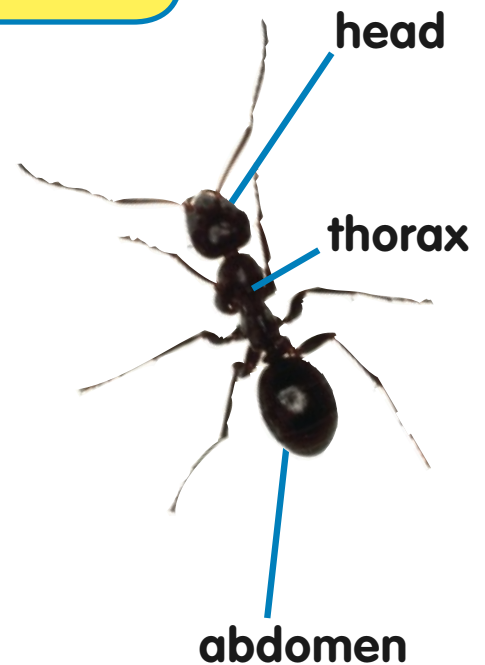
Insects are animals that have three body parts and six legs.

Ants and ladybugs are insects.

ladybug



Ant



Read a Diagram

 Quick Check

Circle the answer.

3. An insect has _____.

10 legs

4 legs

6 legs

4. An insect's body has _____.

2 parts

3 parts

4 parts

What do animals need to live?

Animals need food, water, and air.

They need a safe place to live.



plant

◀ This bear eats plants.

These raccoons
live in a log. ▶

log





▲ These zebras drink water.



Quick Check

5. Draw an animal and one thing it needs to live.
Label your picture.

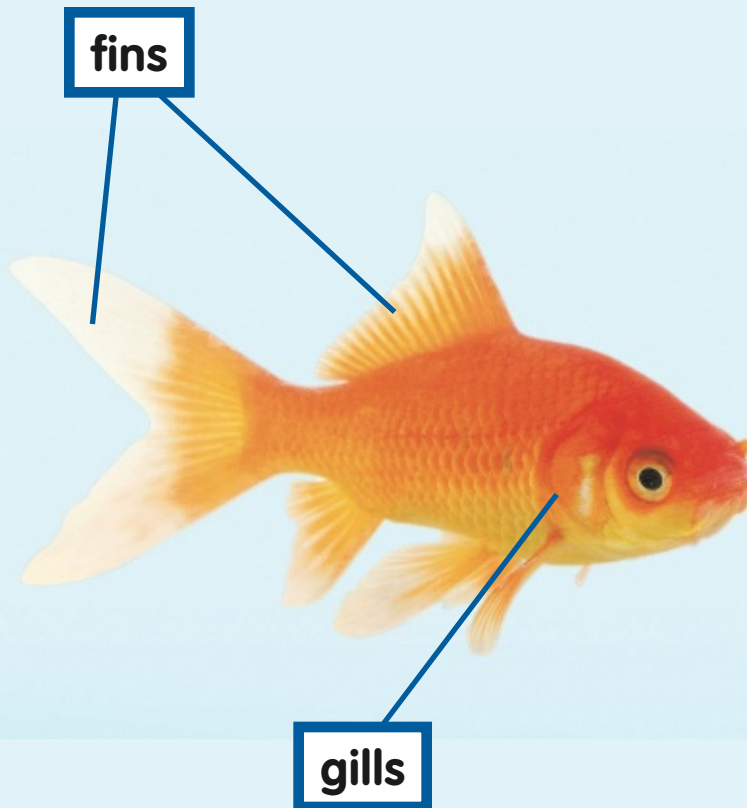
What helps animals live?

All animals need air to live.

Gills help fish get air from water.

Fins help fish swim.

Parts of a fish



Read a Diagram

Why do fish have fins?



Science in Motion Watch how fish

move and breathe

@ www.macmillanmh.com

Animals move to find food, water,
or a place to live.



▲ Wings help birds fly to find food.

 Quick Check

Fill in the blanks.

6.

help fish get air.

7.

help fish swim.

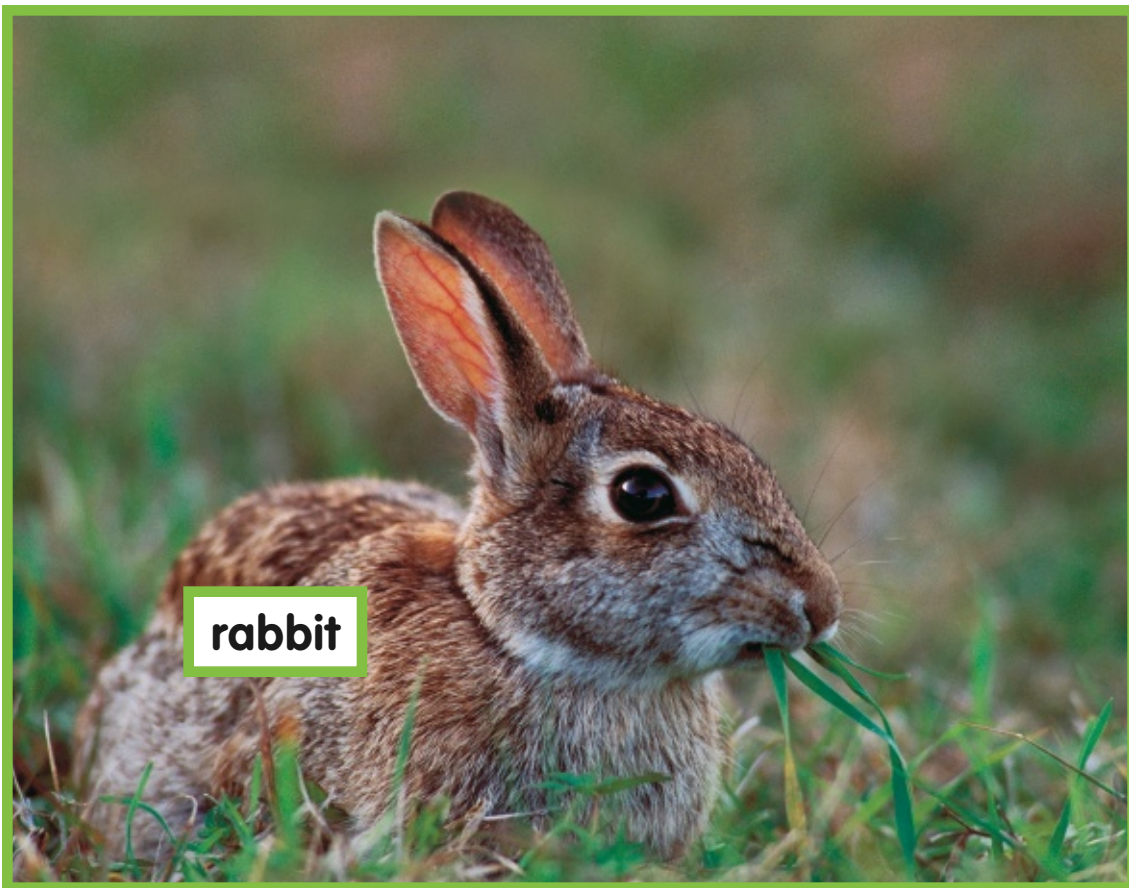
8.

help birds fly.

What do animals eat?

Different animals eat different things.

Some animals eat only plants.



▲ **A rabbit has flat teeth to chew plants.**

Some animals eat only meat.



▲ A tiger has sharp teeth to tear meat.

✓ **Quick Check**

9. Name an animal that eats plants.

10. Name an animal that eats meat.

All About Animals

Draw a line from the word to the picture that tells about it.

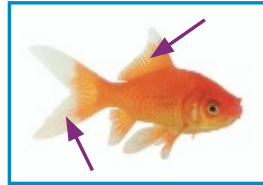
1. reptile



2. insect



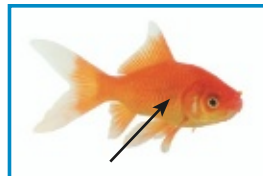
3. fins



4. bird



5. mammal



6. gills



CHAPTER 3

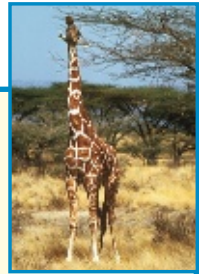
Plants and Animals Together



How do plants and animals need each other?

Vocabulary

grassland a dry place with a lot of grass



forest a place where there are a lot of trees



pond a small body of water that has little or no salt



ocean a large body of salt water



pollen powder inside a flower that makes seeds



food chain shows the order in which living things get the food they need



How do plants and animals live in a grassland?

A **grassland** is a dry place with a lot of grass.

Some grassland animals are small.

They hide from animals that can eat them.



prairie dog

▲ **Prairie dogs hide in holes in the ground.**

Large grassland animals have other ways to stay safe.

Giraffes' long necks help them see danger. ►



Quick Check

Fill in the blanks.

1. _____ hide in holes in the ground.

2. _____ have long necks.

How do plants and animals live in a forest?

A **forest** is a place with many trees.

Big and small animals live in forests.



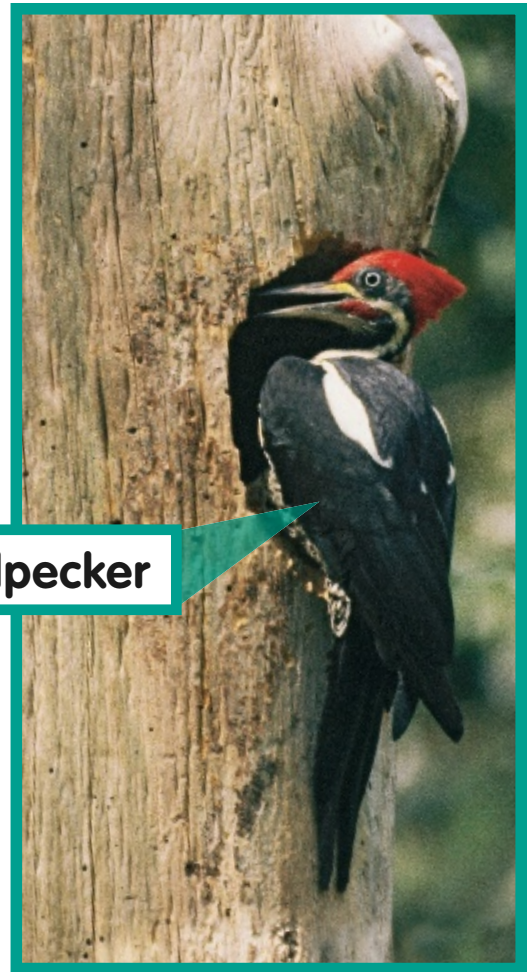
▲ This elk eats forest plants.

Some animals find food
in the trees.

Some animals make a
home in the trees.

woodpecker

This bird made a hole in
the tree for a home. ►



✓ **Quick Check**

Write the names of two forest animals in the chart.

3.

Forest Animals	Grassland Animals
— — — — —	prairie dogs
— — — — —	giraffes

What lives in a pond?

A **pond** is a small body of water that has little or no salt.

Fish and plants live in a pond.



▲ Some birds live near ponds.

Many animals find food and build homes in a pond.



▲ Beavers make their homes in ponds.

 Quick Check

4. Draw a pond with an animal that lives there.
Label your picture.

What lives in an ocean?

An **ocean** is a large body of salt water.

An ocean is very deep.



▲ Many kinds of whales live in the ocean.

Many mammals, fish, and plants live in the ocean.



▲ Sea lions and fish live in the ocean.

✓ **Quick Check**

Fill in the chart. Write the names of three ocean animals.

5.

ocean animals		
 ----- 		 -----

How do plants and animals help each other?

Animals use plants for homes and food.



◀ **This mouse eats berries from a plant.**

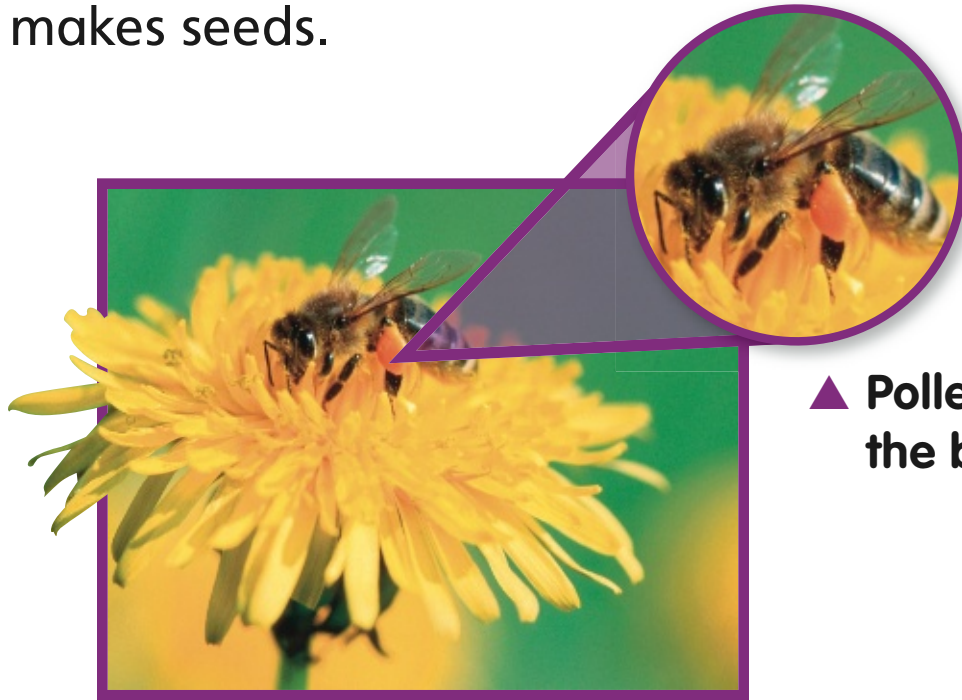
These skunks live in a tree trunk. ▶



Bees help plants make new plants.

They carry pollen from flower to flower.

Pollen is powder inside a flower that makes seeds.



▲ Pollen sticks to the bee's legs.

✓ Quick Check

6. What animal carries pollen?

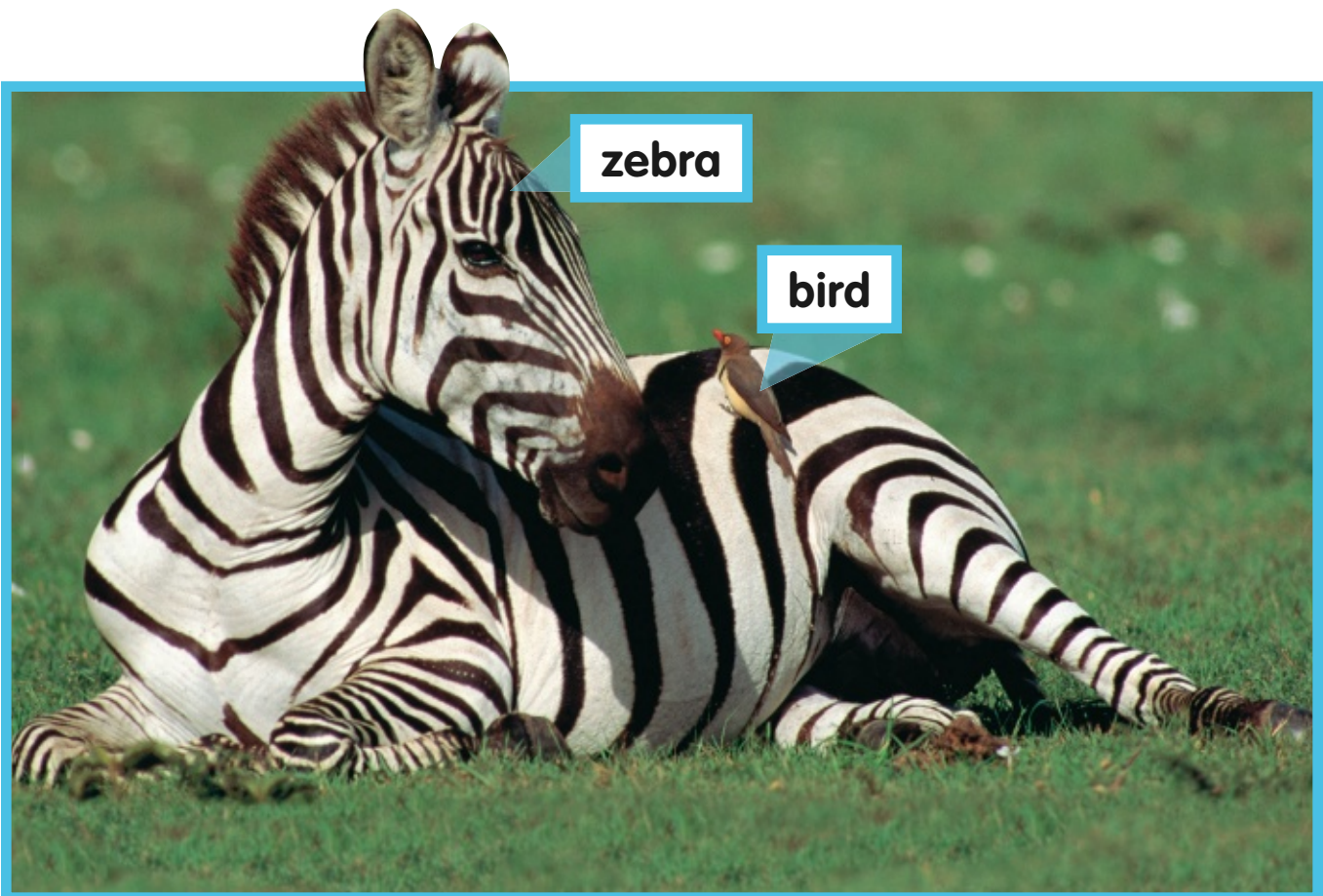
7. A bee moves pollen from flower to

Why do some animals need other animals?

Some animals harm other animals.

Some animals help other animals.

Insects that live on a zebra
can harm a zebra.



- ▲ This bird helps the zebra by eating insects that live on the zebra.

A flea can live on a dog.
It feeds off the dog and
can make the dog sick.



▲ Fleas can harm dogs.

Quick Check

Circle the answer.

8. A bird can _____ a zebra.

help

harm

9. Fleas can _____ a dog.

help

harm

What is a food chain?

All living things need food.

A **food chain** shows the order in which living things get their food.

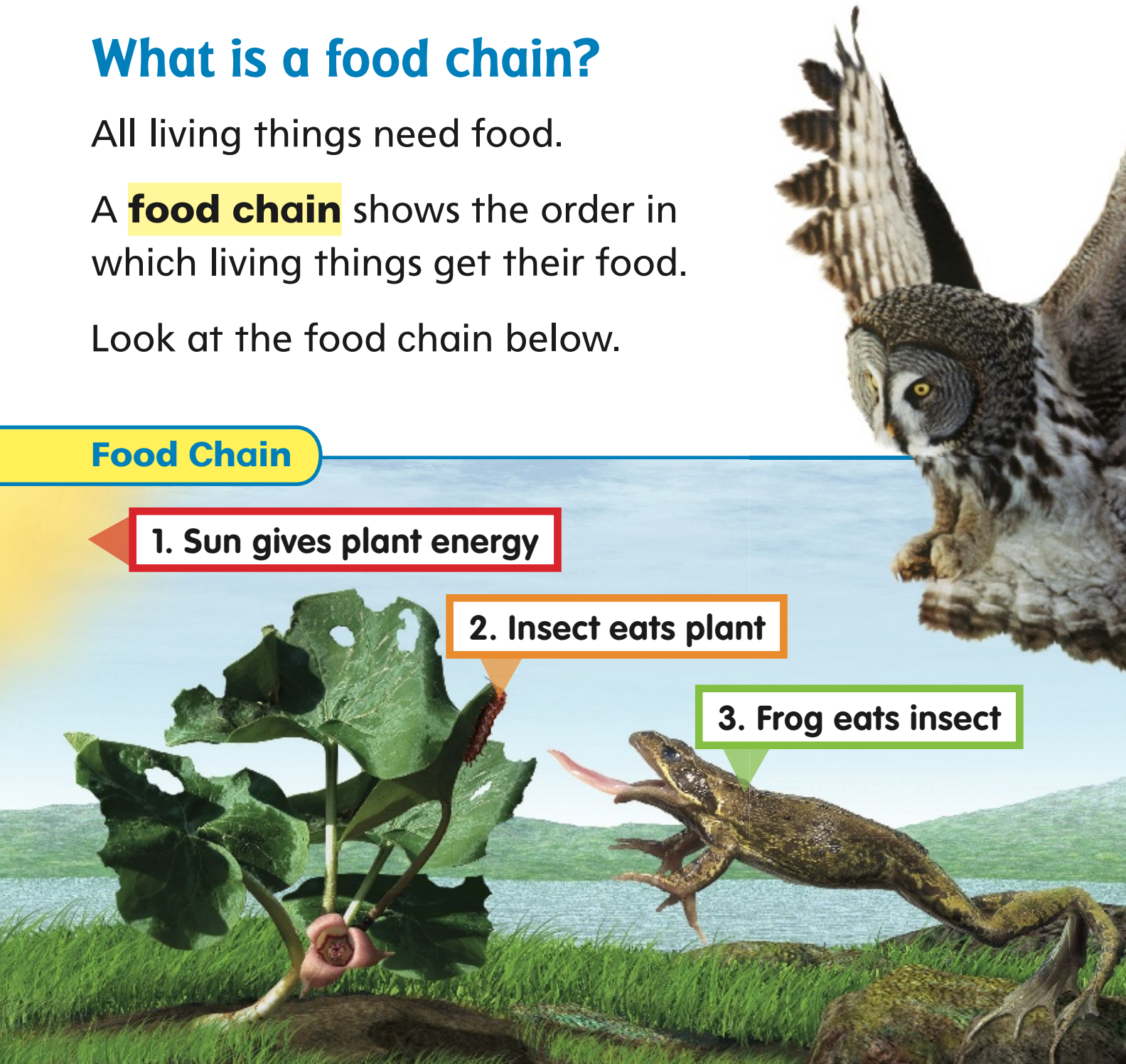
Look at the food chain below.

Food Chain

1. Sun gives plant energy

2. Insect eats plant

3. Frog eats insect





Some animals eat plants.

Some animals eat animals.

Some animals eat both plants and animals.

Read a Diagram

What is the first living thing in this food chain?



Science in Motion Watch a food chain
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4. Owl eats frog



Quick Check

Write the answers to the questions.

I. What do all living things need?

II. What is the last thing in this food chain?



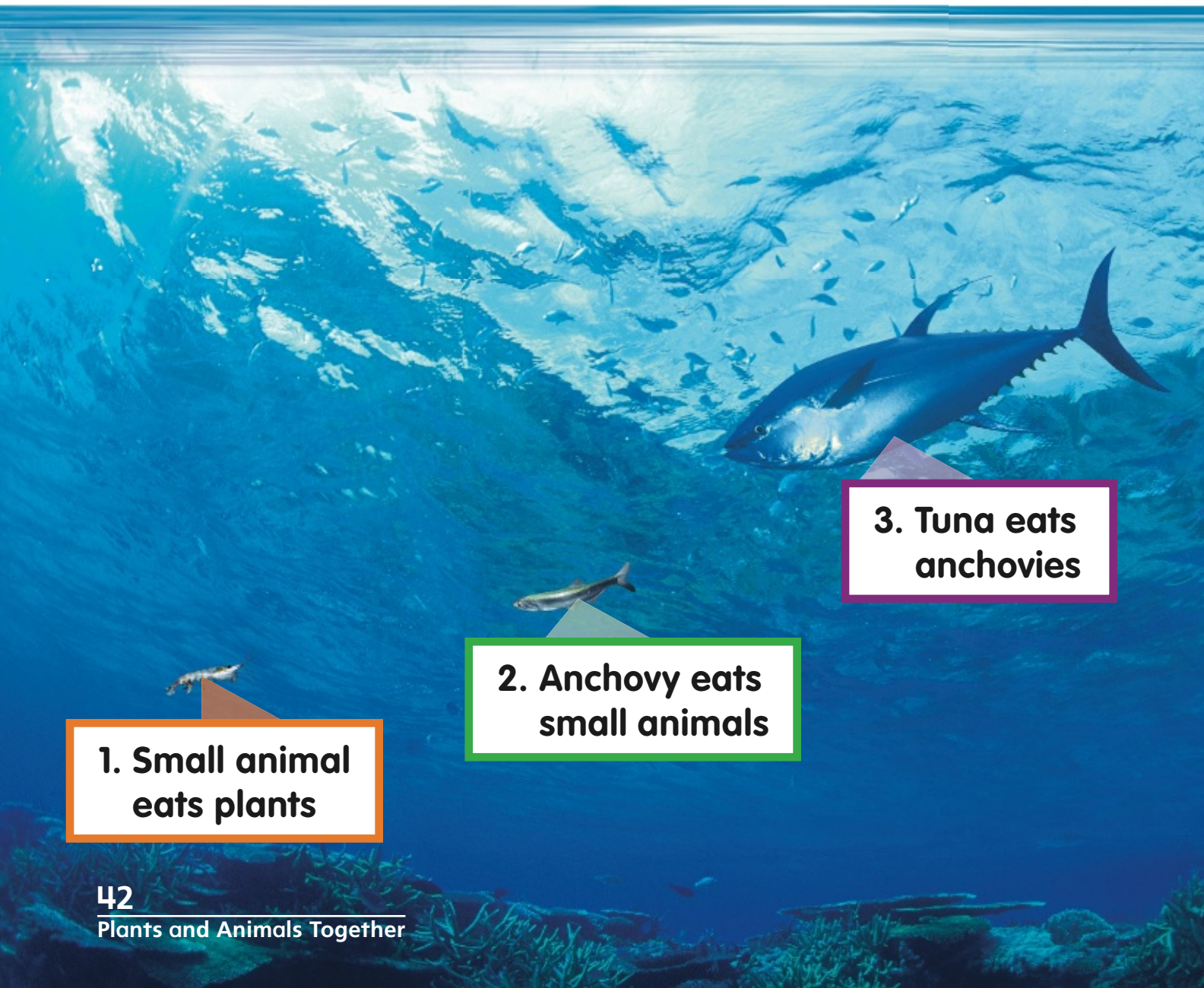
What happens in a food chain?

The Sun starts every food chain.

The Sun helps plants grow.

Plants give animals food to eat.

▼ This diagram shows a water food chain.



**1. Small animal
eats plants**

**2. Anchovy eats
small animals**

**3. Tuna eats
anchovies**

Plants are the first step in most food chains.

People are the last step in this food chain.

People eat tuna.



4. People fish for tuna to eat.

Quick Check

Fill in the blanks about the food chain.

12. Tuna eat _____ .

13. People eat _____ .

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Vocabulary Review

Circle the correct answer.

1. The powder inside a flower is _____.

pink pollen energy

2. A grassland is a _____ place.

wet small dry

3. A _____ shows the order in which living things get food.

food chain forest feather

4. A _____ is a small body of water.

plant pond wing

5. A forest has lots of _____.

fish sand trees

6. An ocean has _____ water.

hot dark salt

CHAPTER 4

Weather



What do you know about weather?

Vocabulary

weather what the air and sky are like each day



temperature how cold or warm the air is



wind moving air



Sun a star that heats Earth



thermometer a tool that measures the temperature of air and water



rain gauge a tool that measures how much rain falls



wind vane a tool that shows which way the wind blows



What is weather?

Weather is what the air and sky are like each day.

The weather may be sunny.

The weather may be cloudy.

sunny



cloudy



The weather may be rainy, snowy, or dry.

rainy



snowy



Quick Check

Write words that tell about four kinds of weather.

I.

Kinds of
Weather

How can weather change?

Temperature is how cold or warm the air is.

Sometimes the air feels cold.

Sometimes the air feels warm.

Some days the sky is clear.

Some days the sky is full of clouds.



▲ It is a cold day.



▲ It is a warm day.

Wind can change, too.

Wind is moving air.

Sometimes wind moves slowly.

Sometimes wind moves fast.



▲ It is a windy day.

Quick Check

2. Draw a picture of today's weather. Write a sentence about it.

What does the Sun do?

The **Sun** is a star that heats Earth.

The Sun's energy warms the land, air, and water.



▲ The Sun makes the sand warm.

The Sun also helps to make wind, rain, clouds, and snow.



Sun



Quick Check

Fill in the blanks.

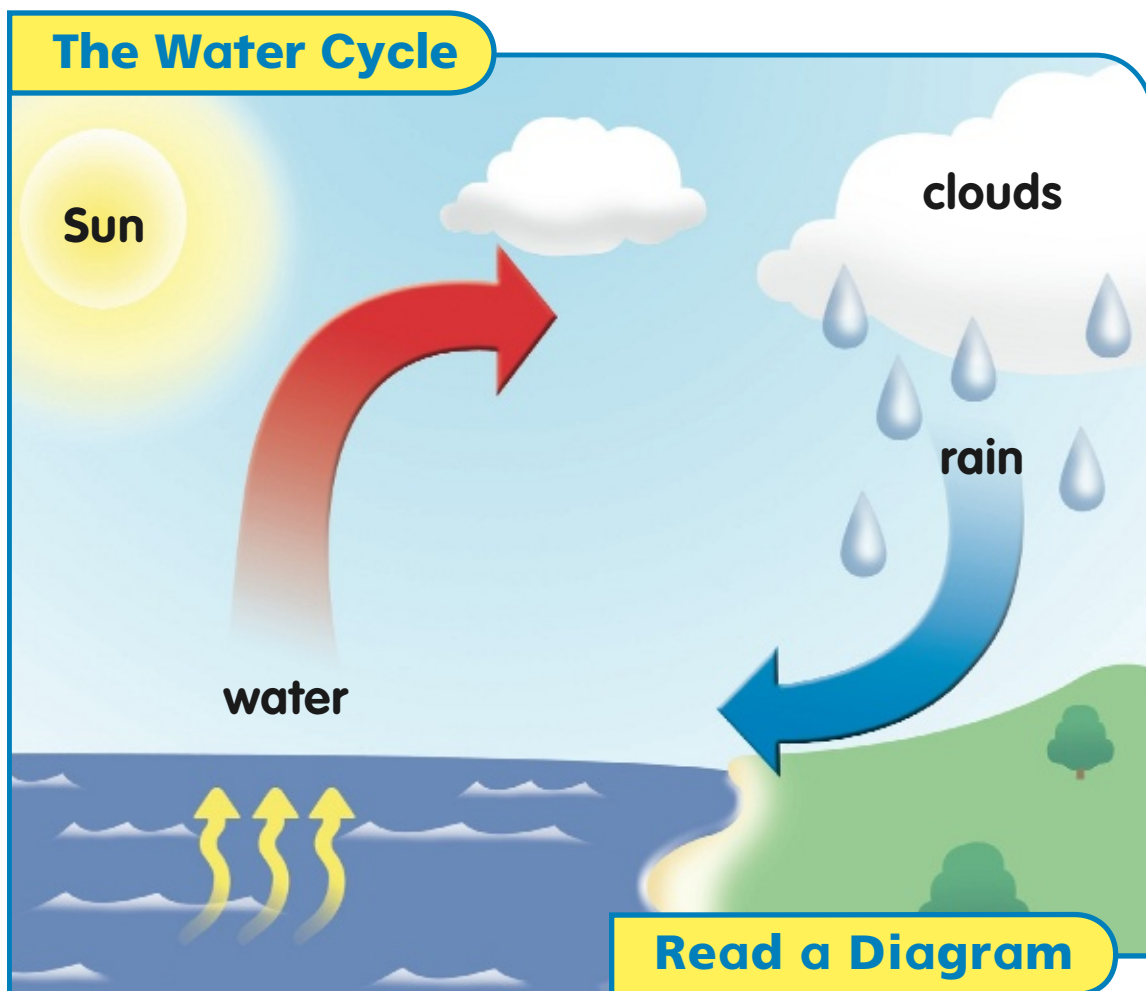
3. The Sun is a _____ .

4. The Sun's energy _____
the land, air, and water.

What does the Sun do to water?

As the Sun warms water, some of the water goes up into the air.

You cannot see the water, but it is there.



Read a Diagram

What falls from clouds?



Science in Motion Watch the water cycle
@ www.macmillanmh.com

As water in the air cools, it turns into drops of water.

When it is cold out, the water turns into bits of ice.

Clouds are made of water and ice.

The drops of water or bits of ice fall to Earth as rain or snow.



▲ The rain is falling.

Quick Check

What are clouds made of?

- - - - -

5. _____

- - - - -

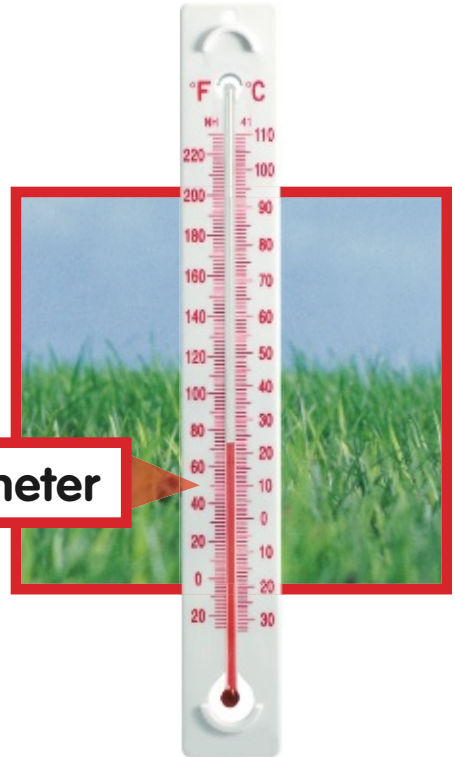
6. _____

How can you measure weather?

There are many kinds of tools to measure weather.

A **thermometer** measures the temperature of air and water.

thermometer

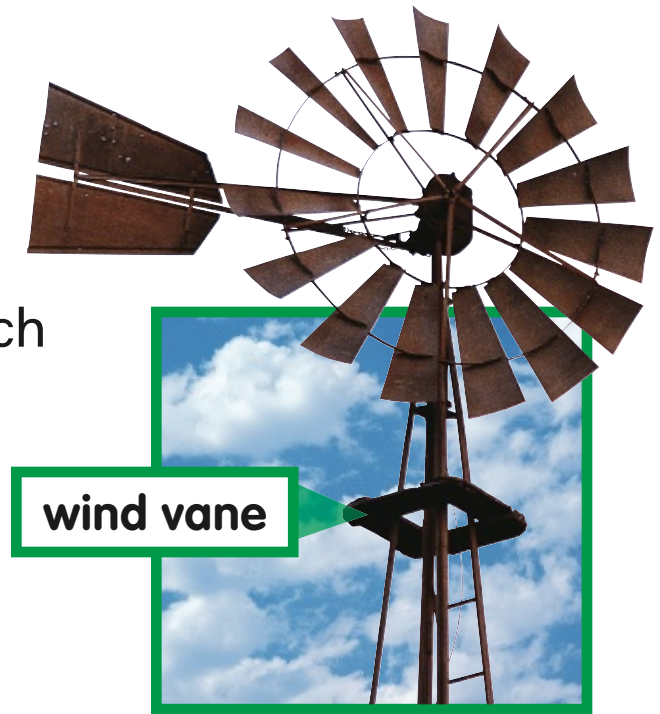


A **rain gauge** measures how much rain falls.

rain gauge



A **wind vane** shows which way the wind blows.



Quick Check

Write the name of the tool next to what it measures.

7.

— — — — —	wind
— — — — —	rain
— — — — —	temperature

How can you learn more about the weather?

You can use tools to measure weather, too.

You can collect information.

You can listen to weather reports.

Weather Report

Monday's Weather

Sunny	
High 	83°
Low 	62°
Wind	strong

Read a Chart

Tell about Monday's weather.



▲ This man is giving a weather report.

You can find weather reports in many places.

You can find them on TV, in the newspaper, and on the computer.



▲ Here is a weather report on the computer.

Quick Check

8. Use the chart. What was the low temperature

on Monday? _____

9. Where can you find out about the weather?

Vocabulary Review

Write the letter of the word or words that answer each question.

- a. rain gauge b. Sun c. wind d. wind vane
e. thermometer f. weather g. temperature

1. What tool shows which way the wind blows?

2. What is a star that heats Earth?

3. What is moving air?

4. What tool measures rain?

5. What tells how hot or cold the air is?

6. What tells what the air and sky are like?

7. What tool measures temperature?

CHAPTER 5

Seasons



What can you predict about the seasons?

Vocabulary

season a time of year: winter, spring, summer, or fall



winter the coldest season



spring the season after winter when many plants grow



summer the hottest season



fall the season after summer when it is cooler



How do you know when it is winter?

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

Winter, spring, summer, and fall are the four seasons of the year.

Winter is the coldest season.



▲ In winter, the air can be very cold.
You can see this boy's breath.

There are fewer hours of sunlight in winter.

Less sunlight means plants have less energy to make food.

Some plants die.



▲ Some plants lose their leaves in winter.

Sunlight in Winter

Date	Sunrise	Sunset	Hours of Sunlight
December 21	6:54 A.M.	4:47 P.M.	9 hours, 53 minutes

Read a Chart



Quick Check

Circle the answer.

1. The coldest season is _____.

fall

winter

spring

2. Use the chart. There are more than _____ hours of sunlight.

9

10

11

What is winter weather like?

Some places are very cold.

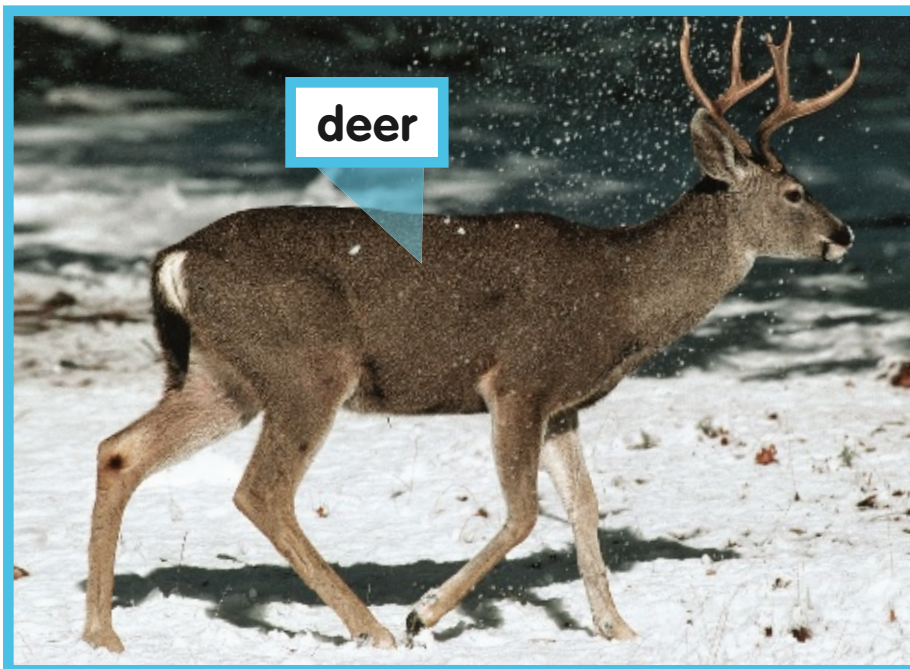
There is not a lot of food for animals to eat.

Some animals look for food.

Others put food away before winter begins, so they have food to eat.



▲ The squirrel puts food away.



▲ The deer looks for food.

In some places, it snows in winter.

In other places, like California, it does not get cold enough to snow.

But it might rain a lot.



▲ It can rain a lot in California.

Quick Check

3. Draw a picture of winter weather where you live. Label your picture.

How do you know when it is spring?

Spring is the season after winter.

Look around you.

You might see butterflies.



butterfly



The sunlight warms the
land, air, and water.



Sunlight in Spring

Sunlight in Spring			
Date	Sunrise	Sunset	Hours of Sunlight
March 21	5:55 A.M.	6:04 P.M.	12 hours, 9 minutes

Read a Chart



What happens in spring?

When spring comes, the weather gets warmer.

It might rain a lot.

Rain and sunlight help plants grow.



▲ In spring, plants begin to grow.

Many animals are born in spring.

Animals eat the plants that grow.

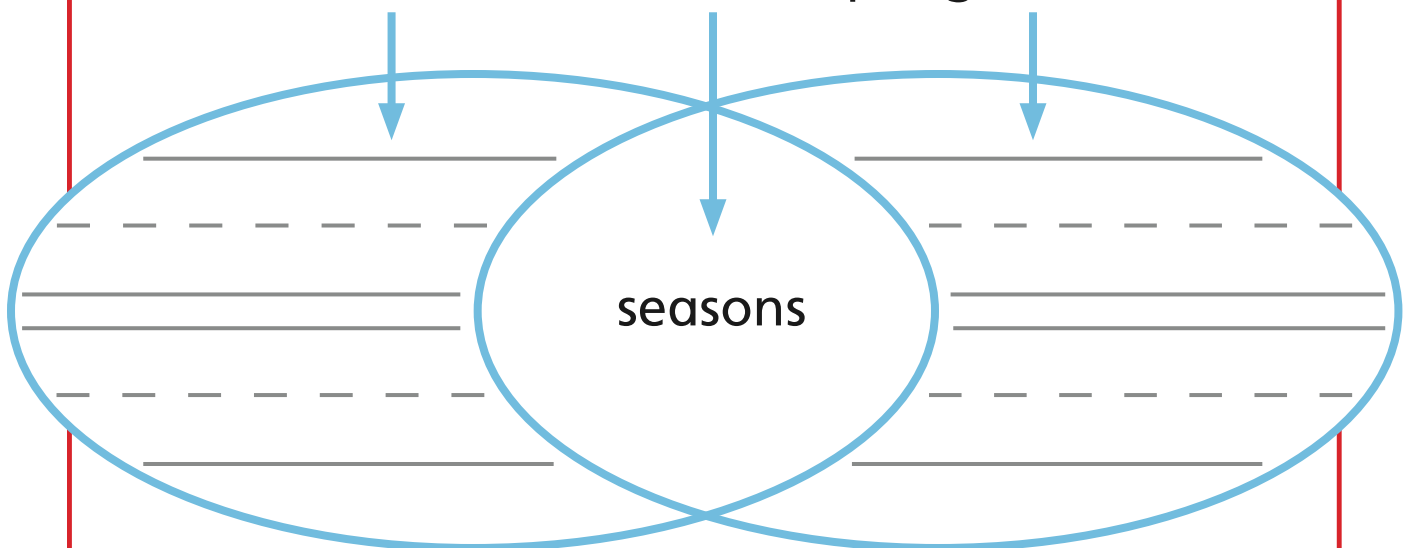
Birds build nests for their young. ▶



✓ **Quick Check**

How are winter and spring different? Write two facts about each season.

6. winter (different) alike spring (different)



How do you know when it is summer?

Summer is the season after spring.

It is the hottest season.

People spend a lot of time outside in summer.



▲ These boys are having fun.

Summer has more hours of sunlight than any other season.

Some animals look for shade to stay cool.



▲ This horse eats grass in the shade.

Summer Sunlight

Date	Sunrise	Sunset	Hours of Sunlight
June 21	5:41 A.M.	8:07 P.M.	14 hours, 26 minutes

Read a Chart



Quick Check

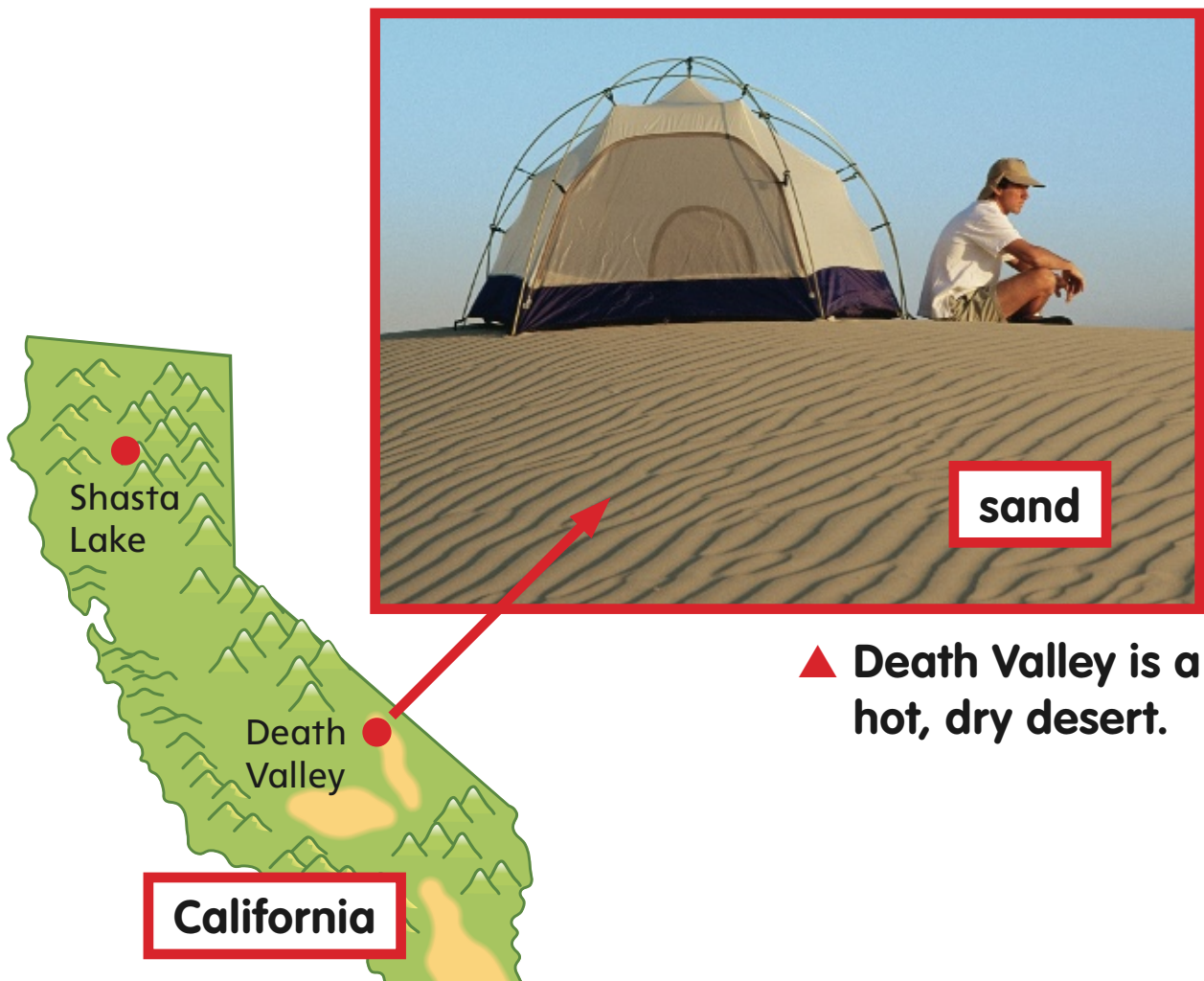
Fill in the blanks.

- _____
- — — — —
7. _____ is the hottest season.
8. Use the chart. There were more _____
- — — — —
- than _____ hours of sunlight on June 21.

What is summer weather like?

In most places in California, it is hot and dry in summer.

Deserts have very hot summers.



Summers may be cooler near the water or in the forest.



▲ Shasta Lake is cool in summer.

✓ Quick Check

Circle the answer.

9. Summers in Death Valley are _____.

cool

wet

hot

10. Summers may be _____ near the water.

hotter

cooler

drier

How do you know when it is fall?

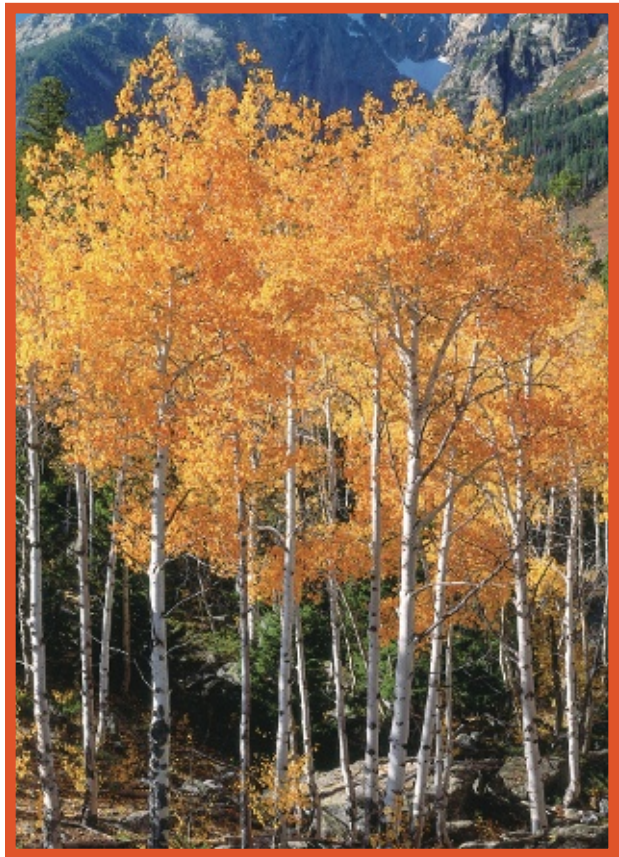
Fall is the season after summer.

Sometimes the air feels cooler.

Some leaves change color in fall.



▲ The leaves of aspen trees are green in summer.



▲ The leaves of aspen trees are orange in fall.

Fall has fewer hours of sunlight than summer.

Less sunlight makes the temperature cooler.

Many places in California stay warm all year.



▲ In fall, some people go to the beach.

Fall Sunlight

Date	Sunrise	Sunset	Hours of Sunlight
September 22	6:40 A.M.	6:50 P.M.	12 hours, 10 minutes

Read a Chart

✓ Quick Check

Fill in the blanks.

11. In fall, less sunlight makes the _____
_____ temperature _____.

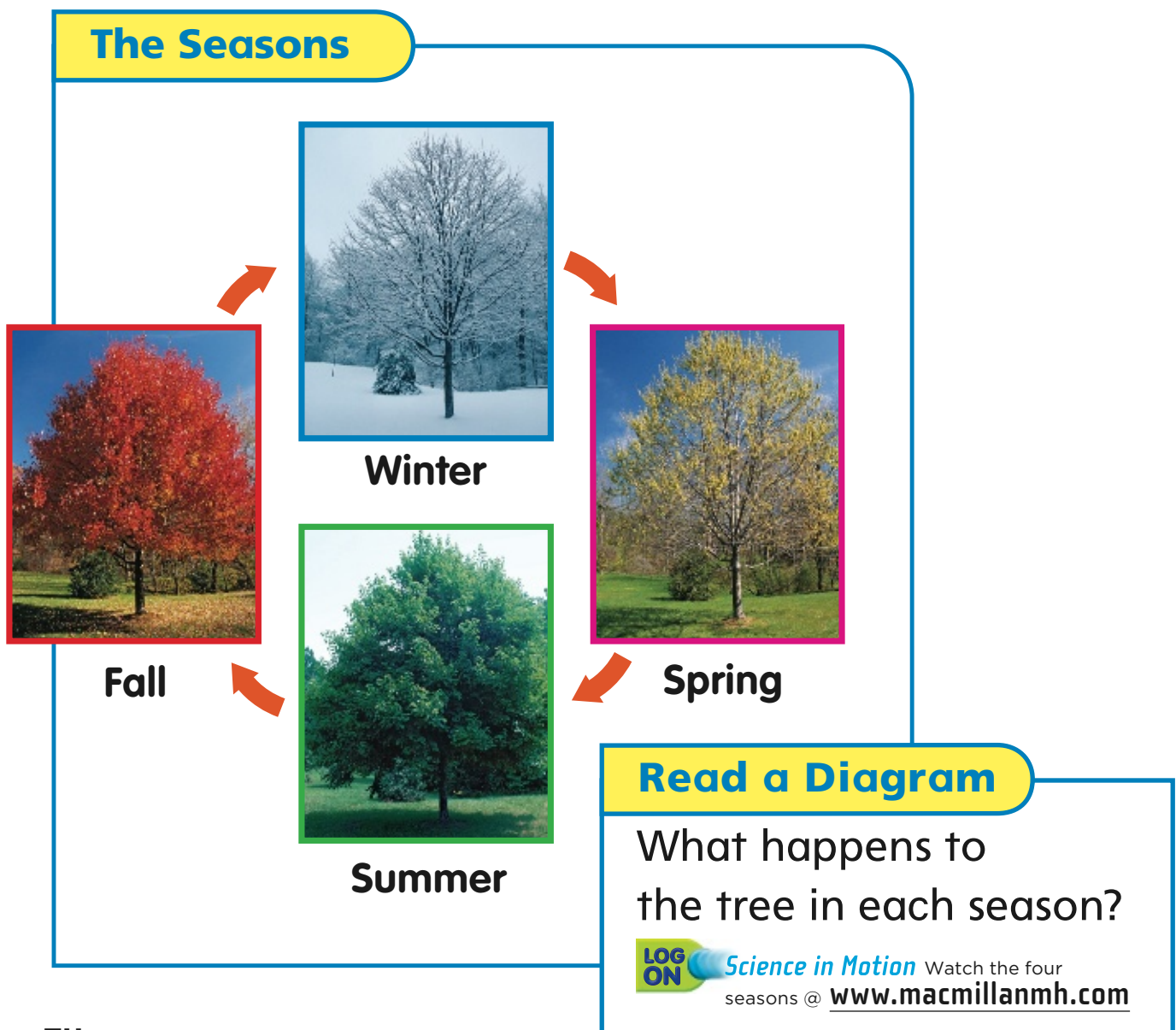
12. Use the chart. There were more than _____
_____ hours of sunlight on September 22.

What happens in fall?

In many places, it rains more in fall than in summer.

Many animals begin to put food away for winter.

Some animals go to warmer places.



In many places, people wear warmer clothes.

Some fruits are ready to be picked in fall.

These pumpkins are ready to be picked. ►



Quick Check

- 13.** Draw a picture that shows what you like to do in fall. Label your picture.

Vocabulary Review

Use the clues below to help you find the words hidden in the puzzle. Two words go across and three words go down.

1. the season after spring
2. the coldest season
3. the season after summer
4. the season after winter
5. a time of year

q	n	s	n	b	v	k
s	v	e	h	c	u	w
p	f	a	l	l	y	i
r	w	s	n	e	s	n
i	b	o	c	g	j	t
n	k	n	p	r	z	e
g	s	u	m	m	e	r

CHAPTER 6

Solids, Liquids, and Gases



What is the world made of?

Vocabulary

matter what all things are made up of



mass how much matter is in an object



balance a tool that can be used to measure mass



solid matter that has a shape of its own



liquid matter that can take the shape of the container it is in



gas matter that spreads out to fill all the space of whatever it is in



How Can You Describe Matter?

Matter is what all things are made up of.

You can describe matter by talking about its color, shape, and size.

You can also describe how matter feels, smells, or tastes.



◀ This toy bear is brown and soft.

There are three kinds of matter.

They are solid, liquid, and gas.



▲ The air inside the raft is a gas.

Quick Check

- I. Draw a picture of an object in your classroom. Tell how it looks and feels.

What is mass?

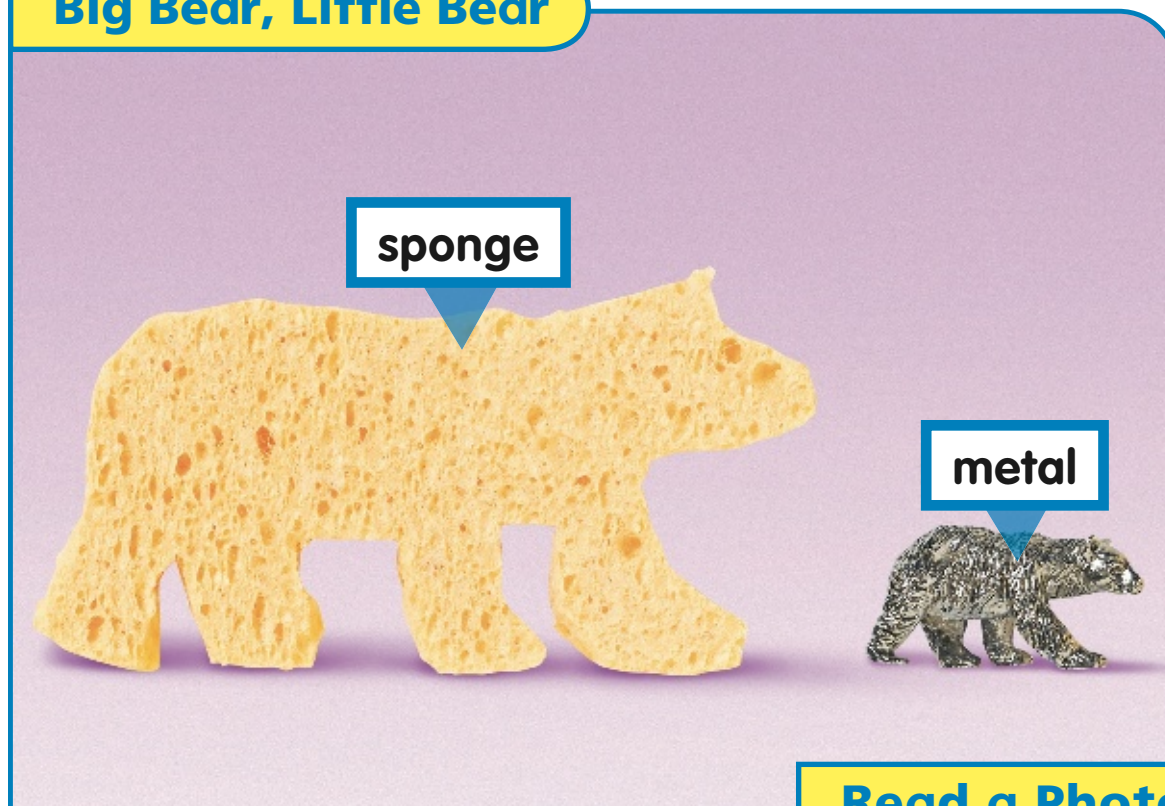
Mass is how much matter is in an object.

Heavy things have more mass than light things.

Look at the photo. The little bear is made of metal.

It is heavier than the big bear that is made from a sponge.

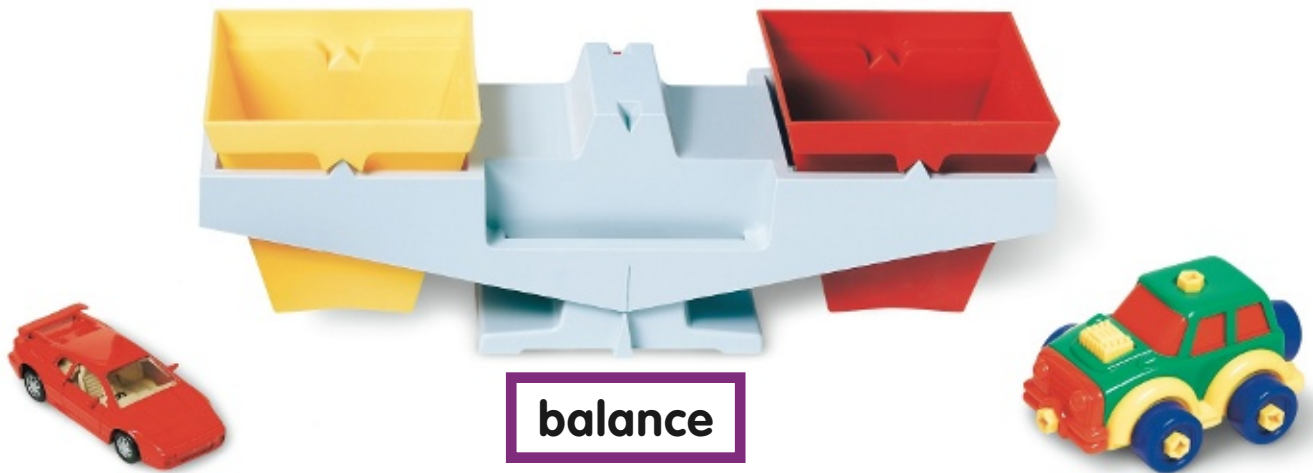
Big Bear, Little Bear



Read a Photo

A **balance** measures mass.

You can find out which toy car has more mass by putting them in a balance.



Quick Check

Circle the answer.

2. Heavier things have _____ mass than lighter things.

less more

3. The little bear in the photo has _____ mass than the big bear.

less more

What is a solid?

A **solid** is matter that has a shape of its own.

Look at the photo. The boy is building with solid wooden blocks.



▲ Solids come in different sizes, shapes, and colors.

The amount of matter in a solid stays the same.

When you take apart a puzzle, the amount of matter in the puzzle does not change.



puzzle



puzzle pieces



Quick Check

List some solids you see on these pages.

4.

5.

How can you describe solids?

Solids can be large or small.

They can be different shapes and colors.

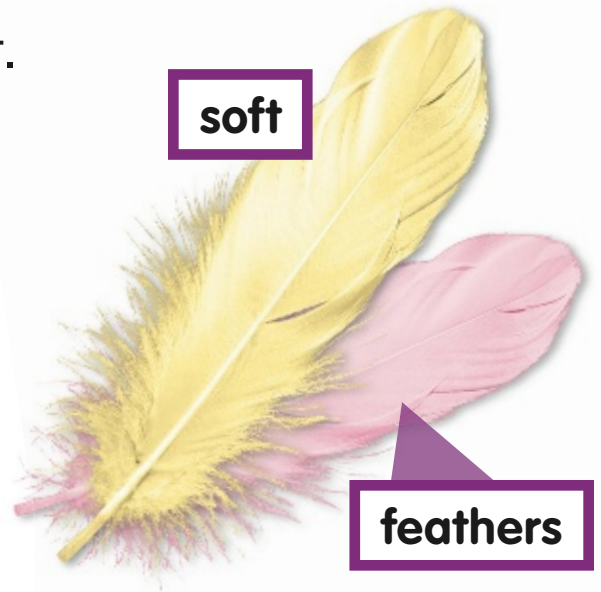
You can fold and bend some solids.

▼ What solids can you see on the puppets?



A solid can feel hard or soft.

A solid can feel smooth or rough.



Quick Check

Circle the answer.

6. A solid that is soft is a _____.

table

feather

brick

7. A solid that can fold is a _____.

rock

wall

piece of paper

What is a liquid?

A **liquid** is matter that can take the shape of the container it is in.

Liquids do not have a shape of their own.

Liquids can move, or flow.



▲ Water is flowing into a lake.

When you put a liquid into different containers, its shape changes.

But the amount of liquid is the same.

Measuring a Liquid



Read a Photo

Quick Check

Fill in the blanks.

8. Liquids do not have their own

9. Look at the three photos. The amount of liquid in each photo is the

How can you describe liquids?

There are many kinds of liquids.

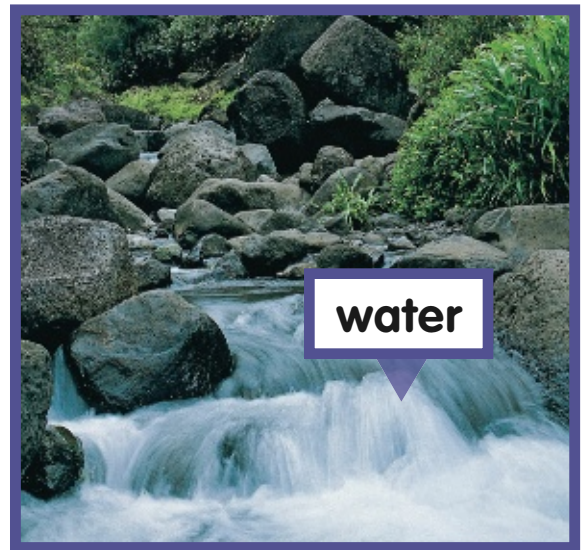
Some liquids are thick.

Mustard and honey are thick liquids. They flow slowly.



Milk and water are thin liquids.

They flow quickly.



Quick Check

Complete the chart. Write the names of two thick liquids and two thin liquids.

10.

Thick Liquids	Thin Liquids
— — — — —	— — — — —
— — — — —	— — — — —

What is a gas?

Gas is matter that spreads out to fill the space of whatever it is in.

Gas does not have its own shape.

These balloons are filled with gas. ►



The air we breathe is made up of different gases.

You cannot see the gases, but you can feel them.



▲ These wind socks are filled with air.



▲ Moving air helps this ribbon stay up.

Quick Check

Circle the answer.

11. The air is made up of different _____.

solids

gases

12. You cannot _____ the air.

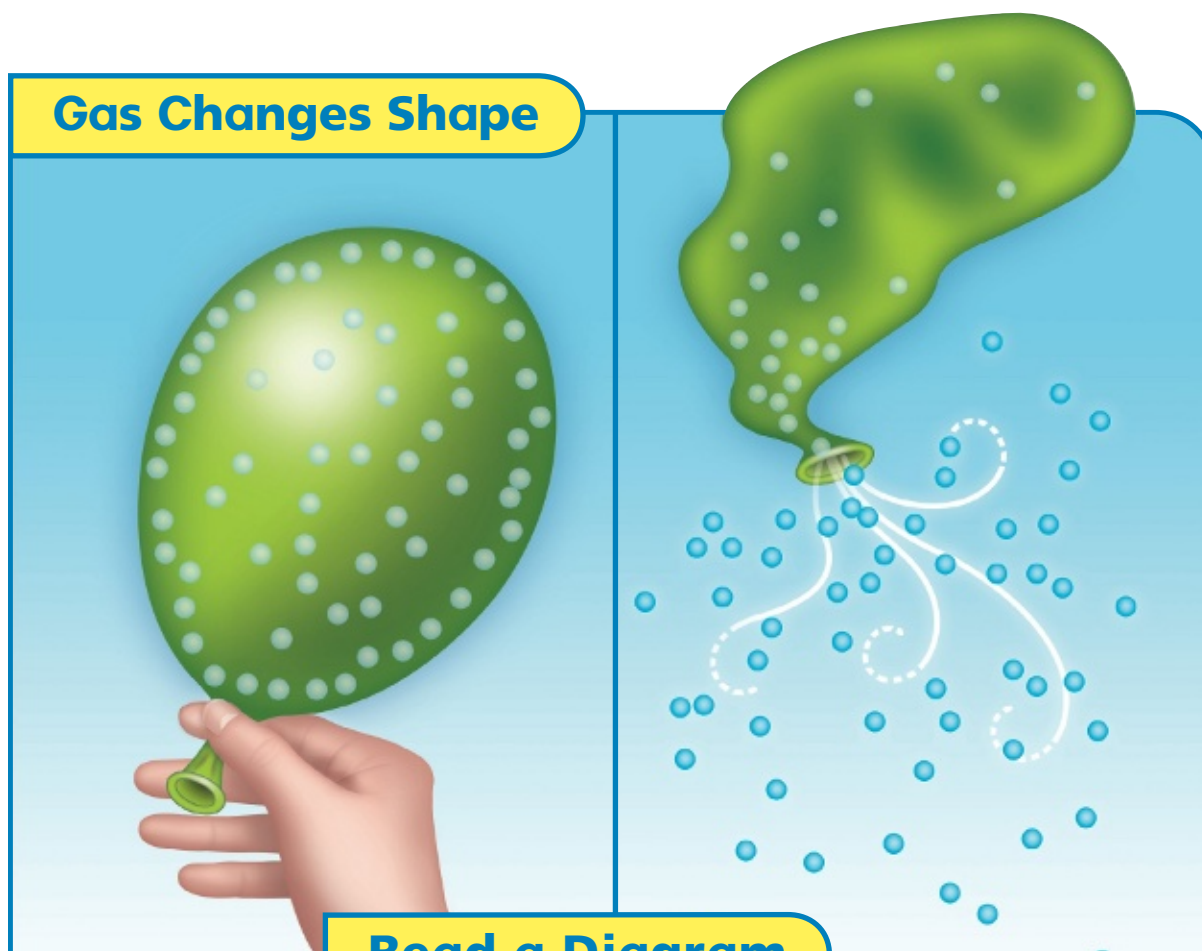
see

feel

How can you describe gases?

Gas spreads out evenly.

Gas can flow up, down, and all around.



Gas Changes Shape

Read a Diagram

Why did the shape of the balloon change? What happened to the gas?



Science in Motion Watch gas changing shape

@ www.macmillanmh.com

When you blow into a balloon, gas fills the inside.

Gas gives these balloons their shape. ►



Quick Check

- 13.** Draw a picture of a balloon filled with gas.
Draw a picture of a balloon that has no gas.
Label the pictures.

Vocabulary Review

Complete each sentence with a word or words from the box.

balance scale gas liquid mass matter solid

1. All things are made up of _____ .

2. Something that is _____
may feel smooth or rough.

3. Milk is a thin _____ .

4. An object's _____
is how much matter it has.

5. You can fill a balloon with _____ .

6. A _____ is a tool
that measures mass.

CHAPTER 7

Changing Matter



How can matter change?

Vocabulary

melt change from a solid to a liquid



evaporate change from a liquid to a gas



boil heat a liquid so that it changes from a liquid to a gas



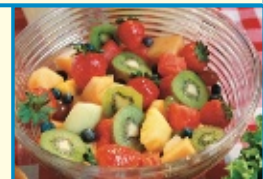
freeze change from a liquid to a solid



cool take heat away



mixture two or more different things put together



How does heat change a solid?

When solids get enough heat, they melt.

To **melt** is to change from a solid to a liquid.



▲ Cheese melts when it is heated.



▲ Ice can melt.

Solids can melt with a little heat or with a lot of heat.



melted glass

▲ It takes a lot of heat to melt glass.



candle wax

▲ It takes only a little heat to melt wax.

✓ Quick Check

Write the names of four solids that can melt.

I.

Solids
That Can
Melt

How can heat change a liquid?

When water is heated, some of it will evaporate.

To **evaporate** is to go into the air as gas.



▲ The Sun's heat evaporated the water and dried the soil.



▲ Each day, some of the water evaporates.

When a liquid gets enough heat, it boils.

When a liquid **boils**, it changes from a liquid to a gas.

Boiling Water



Read a Photo

Quick Check

Circle the answer.

2. Water that evaporates goes into the air as _____.

solid

liquid

gas

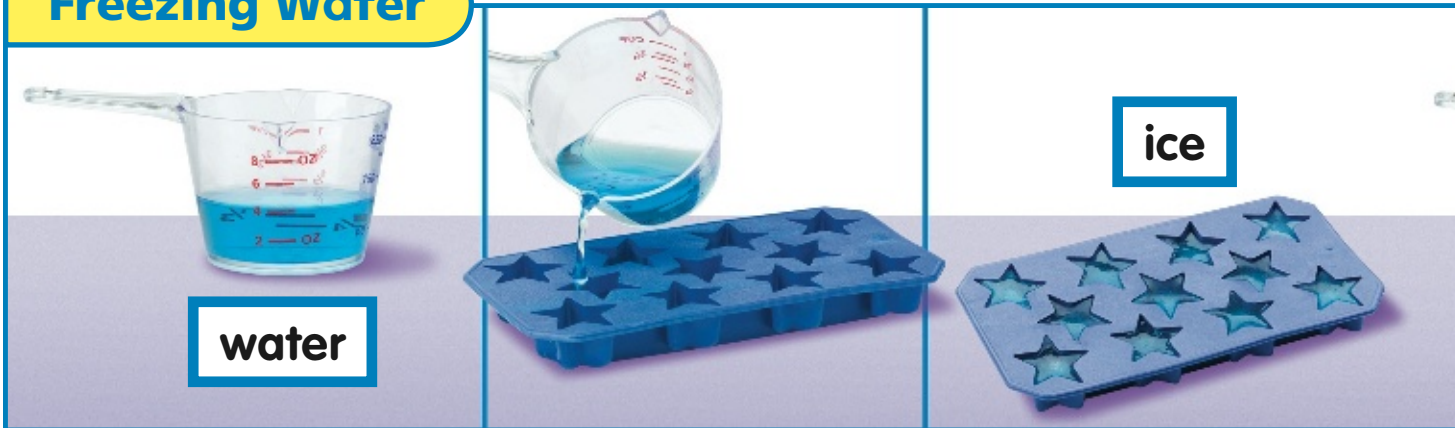
3. When a liquid gets enough heat it _____.

melts

boils

grows

Freezing Water



How can liquids change?

When you put liquid in a freezer, it changes.

When you **freeze** a liquid, it turns into a solid.

You can change frozen water back into a liquid.

When you take the ice out of the freezer, it melts.



Read a Diagram

How can you change the water back into star shapes?



Science in Motion Watch water change
@ www.macmillanmh.com.



Quick Check

Fill in the blanks.

4. When you freeze water, it turns into a

5. When ice melts, it turns into a

How can you cool matter?

When you **cool** something, you take heat away.

Look at the boy in the photo.

He is cooling the soup by blowing on it.

Cooling takes heat away. ▼



When you freeze a liquid, you take away a lot of heat.

Liquids turn into solids when they freeze.

When water freezes, it takes up more space. ►



✓ Quick Check

Circle the answer.

6. When you cool something, you take away the _____.

cold heat

7. When you freeze a liquid, it turns into a _____.

solid gas

What is a mixture?

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

When you mix solids, you can see the different parts of the mixture.

It is easy to pick apart the things in the mixture.

snack



fruit



Find the parts in each mixture.

Some solids completely mix into a liquid.

The solid and the water form a mixture. This mixture is hard to take apart.



Quick Check

8. Draw a picture of a mixture that you like to eat or drink. Label your picture.

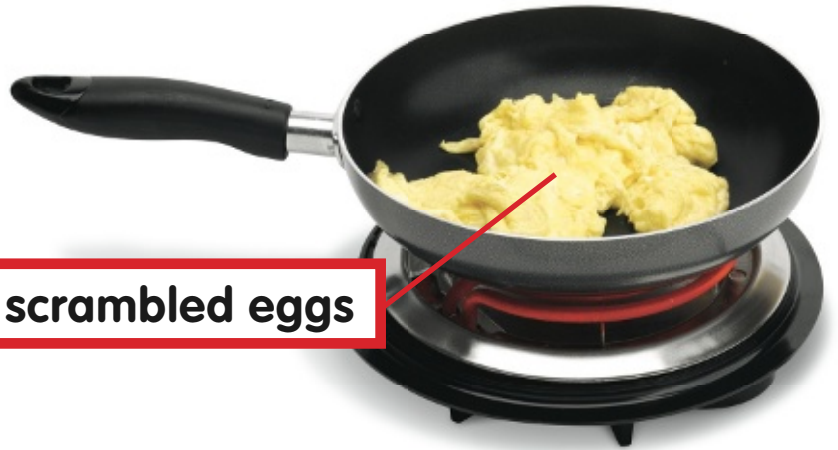
What are other kinds of mixtures?

Sometimes when you mix things, it is not easy to get them back to what they were when you started.



▲ They are mixing eggs and milk.

When you cook a mixture,
heat can change it into
something else.



milk + eggs + heat = scrambled eggs



Quick Check

Fill in the blanks.

9. A mixture of milk + eggs + heat is

10. When you cook something, _____
can change it into something else.

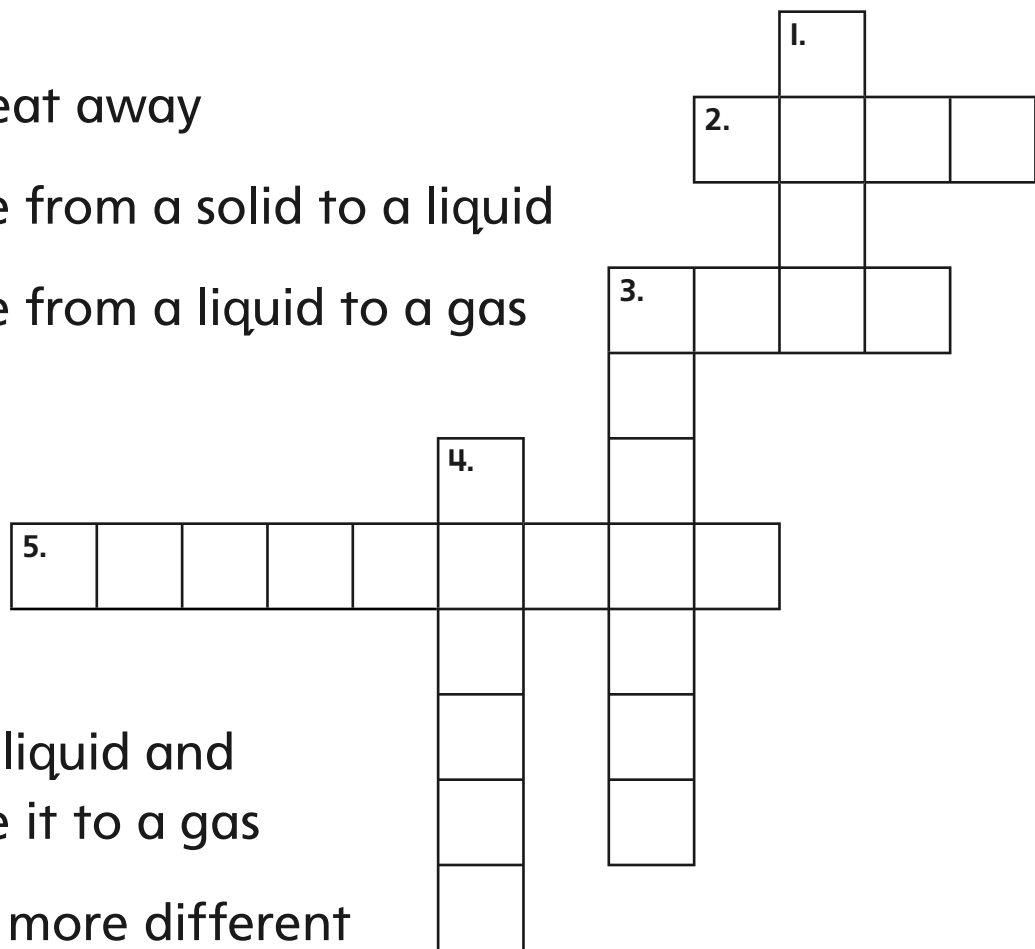
Vocabulary Review

Find the word in the box that matches the clue. Write the word in the puzzle.

boil cool evaporate freeze melt mixture

Across

2. take heat away
3. change from a solid to a liquid
5. change from a liquid to a gas



Down

1. heat a liquid and change it to a gas
3. two or more different things put together
4. turn from a liquid to a solid