Grade 2

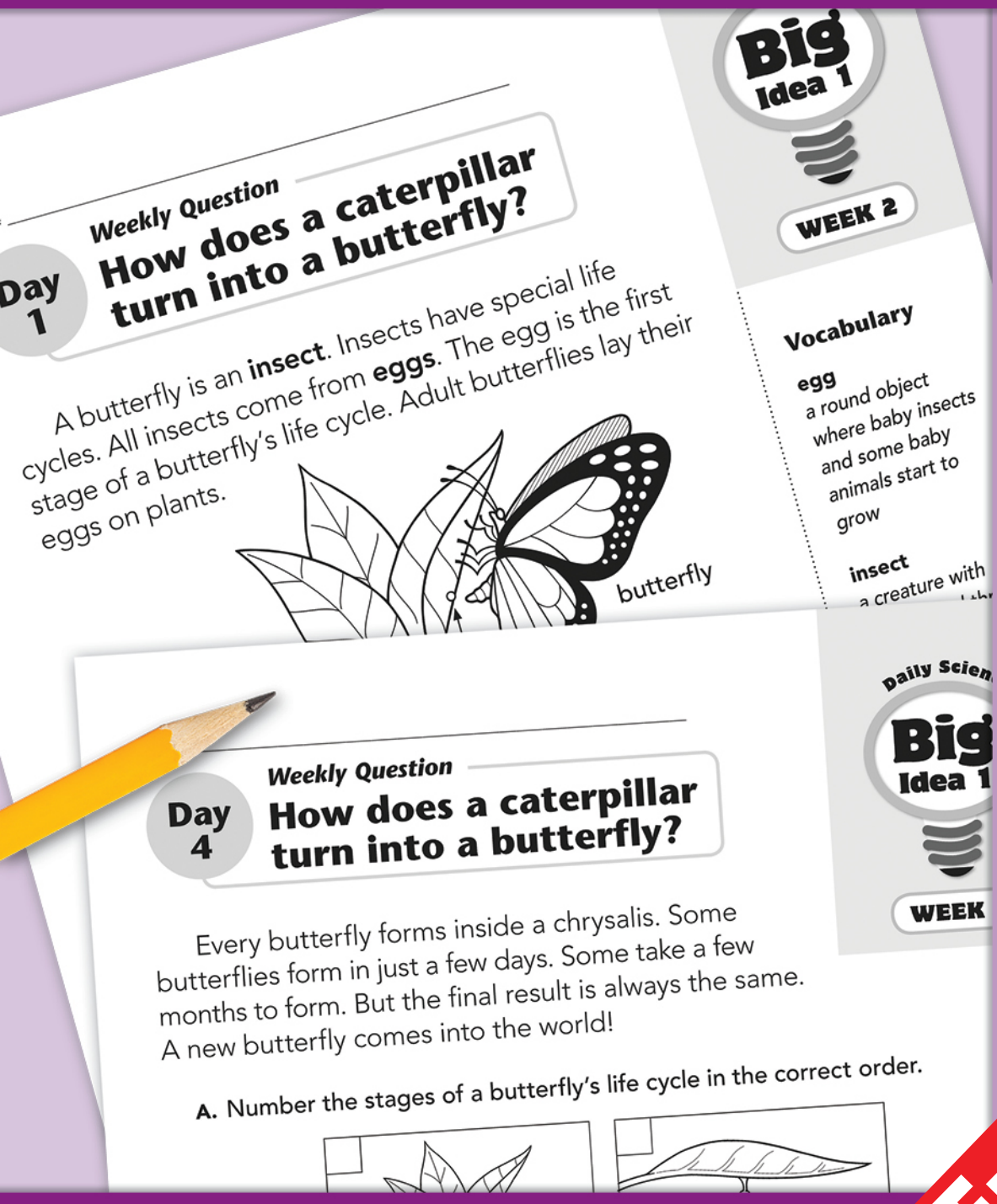
Evan-Moor
EMC 5012

Daily Science

GRADE 2

Correlated to State and Common Core State Standards

- 6 Big Idea units with:
  - 4 standards-based weekly lessons
  - 24 activity pages
  - teacher lesson plans
- Content vocabulary, comprehension, and visual literacy practice
- 6 hands-on activities



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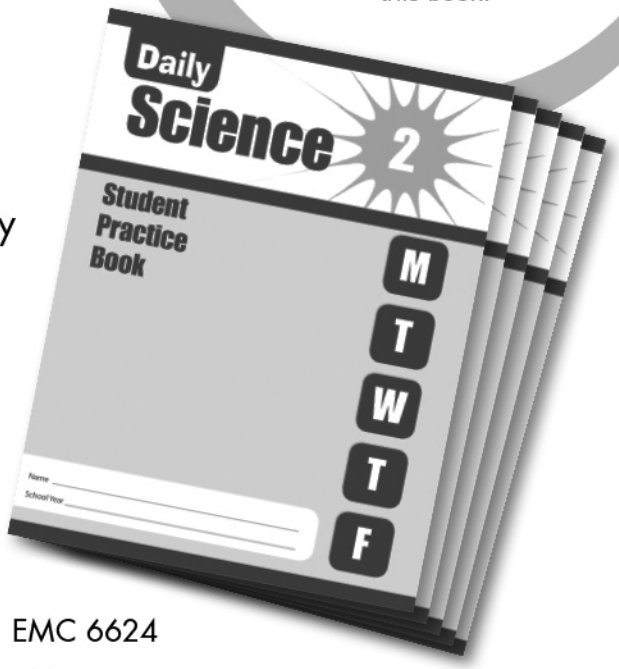

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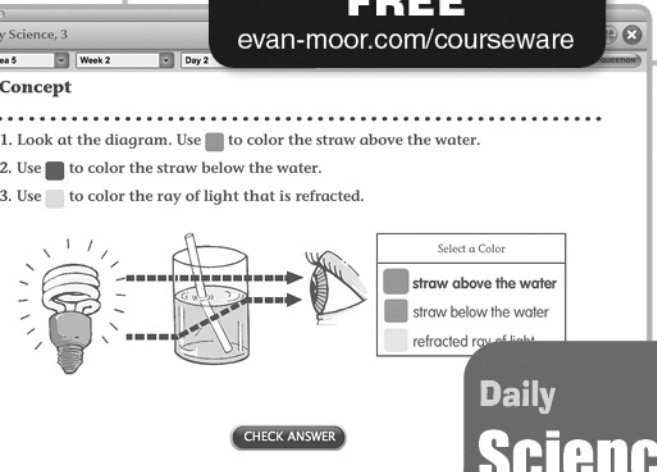

Daily Science

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Daily Science

GRADE 2

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What's in This Book?

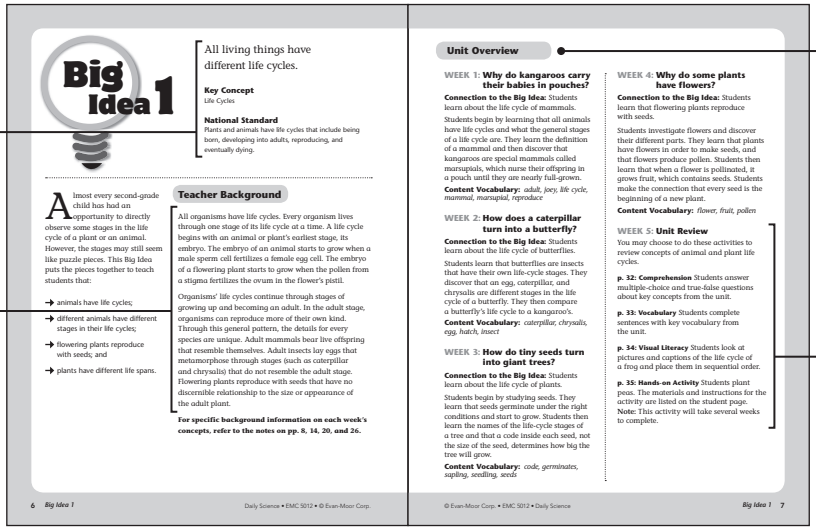
Daily Science provides daily activity pages grouped into six units, called Big Ideas, that explore a wide range of topics based on the national standards for life, earth, and physical sciences. Every Big Idea includes five weekly lessons. The first four weeks each center around an engaging question that taps into students' natural curiosity about the world to develop essential concepts and content vocabulary. The fifth week of each unit offers a hands-on activity and review pages for assessment and extra practice.

The short 10- to 15-minute activities in *Daily Science* allow you to supplement your science instruction every day while developing reading comprehension and practicing content vocabulary.

Unit Introduction

Key science concepts and national science standards covered in the unit are indicated.

Background information is provided on the topic, giving you the knowledge you need to present the unit concepts confidently.



Big Idea 1

All living things have different life cycles.

Key Concept
Life Cycles

National Standard
Plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying.

Teacher Background

Almost every second-grade child has had an opportunity to directly observe some stages in the life cycle of a plant or an animal. However, the stages may still seem like puzzle pieces. This Big Idea puts the pieces together to teach students that:

- animals have life cycles;
- different animals have different stages in their life cycles;
- flowering plants reproduce with seeds; and
- plants have different life spans.

All organisms have life cycles. Every organism lives through one stage of its life cycle at a time. A life cycle begins with an animal or plant's earliest stage, its embryo. The embryo of an animal starts to grow when a male sperm cell fertilizes a female egg cell. The embryo of a flowering plant starts to grow when the pollen from a stigma fertilizes the ovum in the flower's pistil.

Organisms' life cycles continue through stages of growing up and becoming an adult. In the adult stage, organisms can reproduce more of their own kind. Through this general pattern, the details for every species are unique. Adult mammals bear live offspring that resemble themselves. Adult insects lay eggs that metamorphose through stages (such as caterpillar and chrysalis) that do not resemble the adult stage. Flowering plants reproduce with seeds that have no discernible relationship to the size or appearance of the adult plant.

For specific background information on each week's concepts, refer to the notes on pp. 8, 14, 20, and 26.

6 *Big Idea 1*

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Unit Overview

WEEK 1: Why do kangaroos carry their babies in pouches?

Connection to the Big Idea: Students learn about the life cycle of mammals.

Students begin by learning that all animals have life cycles and what the general stages of a life cycle are. They learn the definition of a mammal and then discover that kangaroos are special mammals called marsupials, which nurse their offspring in a pouch until they are nearly full-grown.

Content Vocabulary: *adult, joey, life cycle, mammal, marsupial, reproduce*

WEEK 2: How does a caterpillar turn into a butterfly?

Connection to the Big Idea: Students learn about the life cycle of butterflies.

Students learn that butterflies are insects that have their own life-cycle stages. They discover that an egg, caterpillar, and chrysalis are different stages in the life cycle of a butterfly. They then compare a butterfly's life cycle to a kangaroo's.

Content Vocabulary: *caterpillar, chrysalis, egg, hatch, insect*

WEEK 3: How do tiny seeds turn into giant trees?

Connection to the Big Idea: Students learn about the life cycle of plants.

Students begin by studying seeds. They learn that seeds germinate under the right conditions and start to grow. Students then learn the names of the life-cycle stages of a tree and that a code inside each seed, not the size of the seed, determines how big the tree will grow.

Content Vocabulary: *cone, germinates, sapling, seedling, seeds*

WEEK 4: Why do some plants have flowers?

Connection to the Big Idea: Students learn that flowering plants reproduce with seeds.

Students investigate flowers and discover their different parts. They learn that plants have flowers in order to make seeds, and that flowers produce pollen. Students then learn that when a flower is pollinated, it grows fruit, which contains seeds. Students make the connection that every seed is the beginning of a new plant.

Content Vocabulary: *flower, fruit, pollen*

WEEK 5: Unit Review

You may choose to do these activities to review concepts of animal and plant life cycles.

p. 32: Comprehension Students answer multiple-choice and true-false questions about key concepts from the unit.

p. 33: Vocabulary Students complete sentences with key vocabulary from the unit.

p. 34: Visual Literacy Students look at pictures and captions of the life cycle of a frog and place them in sequential order.

p. 35: Hands-on Activity Students plant peas. The materials and instructions for the activity are listed on the student page. **Note:** This activity will take several weeks to complete.

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Big Idea 1 7

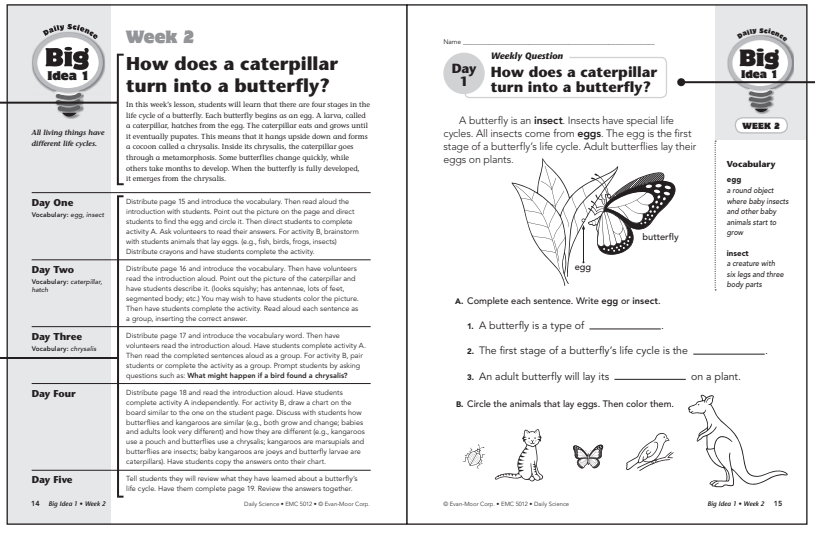
An overview of the four weekly lessons shows you each weekly question, explains what students will learn, and lists content vocabulary.

Week 5 review activities are summarized.

Weekly Lessons (Weeks 1–4)

Each week begins with a teacher page that provides additional background information specific to the weekly question.

Ideas are given for presenting the daily activity pages, including content vocabulary and materials needed for any demonstrations or group activities.



Daily Science Big Idea 1

All living things have different life cycles.

Week 2

How does a caterpillar turn into a butterfly?

In this week's lesson, students will learn that there are four stages in the life cycle of a butterfly. Each butterfly begins as an egg. A larva, called a caterpillar, hatches from the egg. The caterpillar eats and grows until it eventually pupates. This means that it hangs upside down and forms a cocoon called a chrysalis. Inside its chrysalis, the caterpillar goes through a metamorphosis. Some butterflies change quickly, while others take months to develop. When the butterfly is fully developed, it emerges from the chrysalis.

Day One
Vocabulary: *egg, insect*
Distribute page 15 and introduce the vocabulary. Then read aloud the introduction with students. Point out the picture on the page and direct students to find the egg and circle it. Then direct students to complete activity A. Ask volunteers to read their answers. For activity B, brainstorm with students animals that lay eggs. (e.g., fish, birds, frogs, insects) Distribute crayons and have students complete the activity.

Day Two
Vocabulary: *caterpillar, hatch*
Distribute page 16 and introduce the vocabulary. Then have volunteers read the introduction aloud. Point out the picture of the caterpillar and have students describe it. (looks squishy; has antennae; lots of feet, segmented body; etc.) You may wish to have students color the picture. Then have students complete the activity. Read aloud each sentence as a group, inserting the correct answer.

Day Three
Vocabulary: *chrysalis*
Distribute page 17 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Have students complete activity A. Then read the completed sentences aloud as a group. For activity B, pair students or complete the activity as a group. Prompt students by asking questions such as: **What might happen if a bird found a chrysalis?**

Day Four
Distribute page 18 and read the introduction aloud. Have students complete activity A independently. For activity B, draw a chart on the board similar to the one on the student page. Discuss with students how butterflies and kangaroos are similar (e.g., both grow and change; babies and adults look very different) and how they are different (e.g., kangaroos use a pouch and butterflies use a chrysalis; kangaroos are marsupials and butterflies are insects; baby kangaroos are joeys and butterfly larvae are caterpillars). Have students copy the answers onto their chart.

Day Five
Tell students they will review what they have learned about a butterfly's life cycle. Have them complete page 19. Review the answers together.

14 *Big Idea 1 • Week 2*

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Name _____

Weekly Question

Day 1 **How does a caterpillar turn into a butterfly?**

A butterfly is an **insect**. Insects have special life cycles. All insects come from **eggs**. The egg is the first stage of a butterfly's life cycle. Adult butterflies lay their eggs on plants.

butterfly

egg

A. Complete each sentence. Write **egg** or **insect**.

1. A butterfly is a type of _____.
2. The first stage of a butterfly's life cycle is the _____.
3. An adult butterfly will lay its _____ on a plant.

B. Circle the animals that lay eggs. Then color them.

Daily Science Big Idea 1 WEEK 2

Vocabulary

egg
a round object where baby insects and other baby animals start to grow

insect
a creature with six legs and three body parts

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Big Idea 1 • Week 2 15

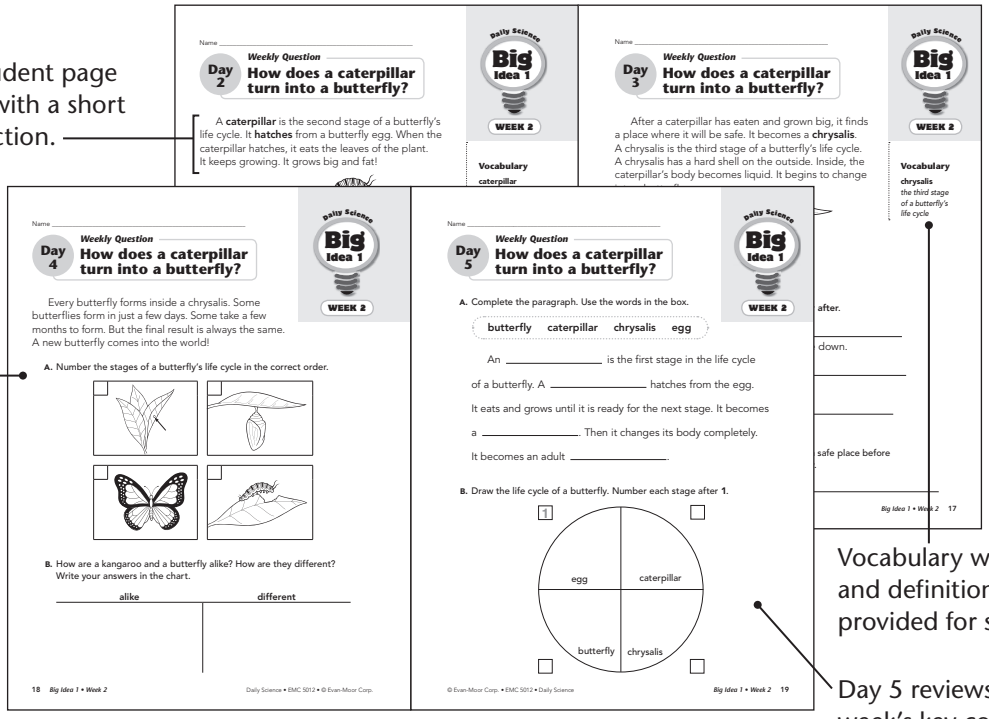
The student activity pages for Days 1–4 of each week use an inquiry-based model to help students answer the weekly question and understand fundamental concepts related to the Big Idea.

You may wish to have students complete the pages independently or collaboratively.

Weekly Lessons, continued

Each student page begins with a short introduction.

Activities include a variety of writing, comprehension, vocabulary, critical thinking, visual literacy, and oral language practice.



Vocabulary words and definitions are provided for students.

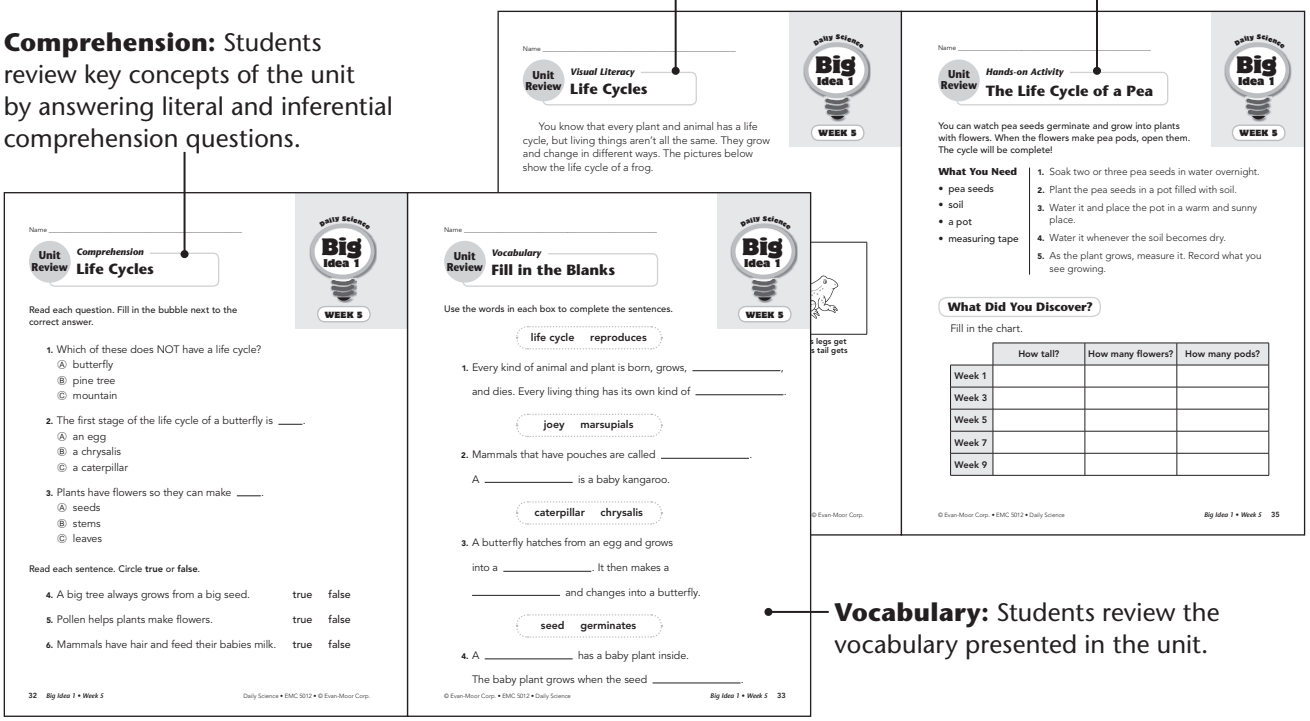
Day 5 reviews the week's key concepts and vocabulary.

Unit Review (Week 5)

Visual Literacy: Students practice skills such as labeling diagrams, reading captions, and sequencing steps in a process.

Hands-on Activity: Students participate in a hands-on learning experience.

Comprehension: Students review key concepts of the unit by answering literal and inferential comprehension questions.



Vocabulary: Students review the vocabulary presented in the unit.

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Content Vocabulary: *adult, joey, life cycle, mammal, marsupial, reproduce*

WEEK 2: How does a caterpillar turn into a butterfly?

Connection to the Big Idea: Students learn about the life cycle of butterflies.

Students learn that butterflies are insects that have their own life-cycle stages. They discover that an egg, caterpillar, and chrysalis are different stages in the life cycle of a butterfly. They then compare a butterfly's life cycle to a kangaroo's.

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WEEK 3: How do tiny seeds turn into giant trees?

Connection to the Big Idea: Students learn about the life cycle of plants.

Students begin by studying seeds. They learn that seeds germinate under the right conditions and start to grow. Students then learn the names of the life-cycle stages of a tree and that a code inside each seed, not the size of the seed, determines how big the tree will grow.

Content Vocabulary: *code, germinates, sapling, seedling, seeds*

WEEK 4: Why do some plants have flowers?

Connection to the Big Idea: Students learn that flowering plants reproduce with seeds.

Students investigate flowers and discover their different parts. They learn that plants have flowers in order to make seeds, and that flowers produce pollen. Students then learn that when a flower is pollinated, it grows fruit, which contains seeds. Students make the connection that every seed is the beginning of a new plant.

Content Vocabulary: *flower, fruit, pollen*

WEEK 5: Unit Review

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All living things have different life cycles.

Week 1

Why do kangaroos carry their babies in pouches?

Kangaroos belong to a group of mammals called marsupials. Marsupial babies are born while they are still fetuses, about four to five weeks old. Female marsupials have a pouch where their babies continue to grow after they are born. The baby crawls up its mother's belly to the pouch, where it continues to develop. Later, it temporarily leaves the pouch but returns for warmth and milk. A young kangaroo leaves the pouch permanently at about eight months, when it is almost its mother's size.

Day One

Vocabulary: *adult, life cycle, reproduce*

Tell students they will learn about life cycles. Distribute page 9, preview the vocabulary, and read the introduction with students. Point out the pictures on the page and say: **Before we learn about kangaroos, let's look at a more familiar animal. This is the life cycle of a dog.** Discuss each picture and explain how the cycle progresses. Have students complete the first two activities. For the oral activity, divide students into pairs or complete the activity as a group. Help students understand that both kangaroos and dogs grow from babies to adults, but that they grow differently.

Day Two

Vocabulary: *mammal, marsupial*

Materials: pictures of marsupials

Distribute page 10, introduce the vocabulary, and read the introduction with students. Invite students to name mammals that they know. (cat, mouse, monkey, etc.) Then show students the pictures of marsupials that you brought, such as opossums, koalas, and so on. Have students complete the activities, and go over the answers together.

Day Three

Materials: pictures of marsupials

Distribute page 11 and read the introduction with students. Point out the pictures on the page and have a volunteer read the caption. Explain: **Baby marsupials cannot care for themselves after they are born. They need time to grow. This is why they stay in their mothers' pouches.** Have students complete the activity. Then go over the answers together.

Day Four

Vocabulary: *joey*

Distribute page 12 and introduce the vocabulary word. Then read the introduction with students. Have students complete activity A independently. For activity B, read aloud each statement and have students circle their answers. For the oral activity, divide students into pairs or complete the activity as a group.

Day Five

Tell students they will review everything they have learned about life cycles and kangaroos. Distribute page 13 and have students complete the activities. Then go over the answers together.

Name _____

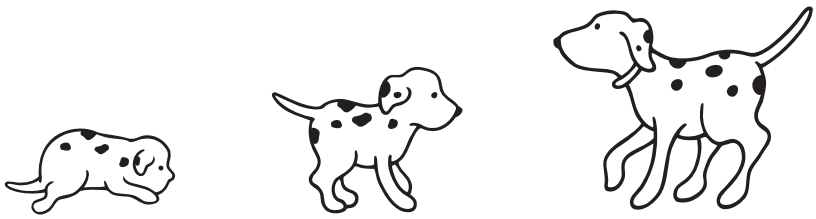
Daily Science
Big Idea 1
WEEK 1

Day 1

Weekly Question

Why do kangaroos carry their babies in pouches?

All animals have a **life cycle**. They begin by being born. They grow from babies to **adults**. Adults **reproduce** and have their own babies. The babies begin new life cycles. They will grow into adults, just like their parents.



puppy → 6 months old → adult

A. Look at the pictures of the dog again. Then write vocabulary words to complete the sentences.

1. The pictures show the _____ of a dog.
2. Dogs _____ by having puppies.
3. A baby puppy grows into an _____ dog.

B. Complete the sentence. Write **babies** or **adults**.

Only _____ can reproduce.

Talk

Do you think kangaroos have a life cycle like dogs do? Why or why not? Tell your partner.

Vocabulary

adult
a living thing that is fully grown and can reproduce

life cycle
a pattern of being born, growing, reproducing, and dying

reproduce
to make more of the same kind

Name _____

Daily Science
Big Idea 1
WEEK 1

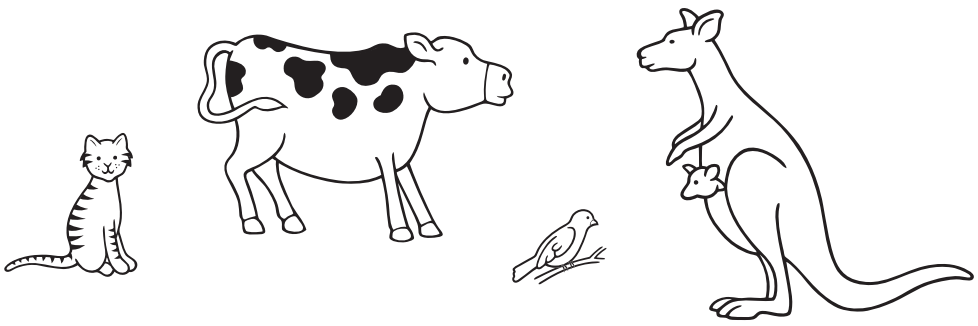
Day 2

Weekly Question

Why do kangaroos carry their babies in pouches?

Dogs, horses, and humans are all **mammals**. Mammals have fur or hair. Mammal mothers feed their babies milk. They also care for their babies for a long time. Kangaroos are a special kind of mammal called a **marsupial**. A marsupial is a mammal that has a pouch.

A. Circle the mammals. Draw a star by the marsupial.



B. Complete each sentence. Write **mammal** or **marsupial**.

1. A cat is a _____.
2. A kangaroo is a special mammal called a _____.

C. Read each sentence. Write **yes** or **no** next to it.

1. All mammals have pouches. _____
2. All mammals have fur or hair. _____
3. Marsupials feed their babies milk. _____
4. Humans are mammals. _____

Vocabulary

mammal
an animal that is warmblooded, has a backbone, and nurses its babies with milk

marsupial
a mammal that carries its babies in a pouch

Name _____

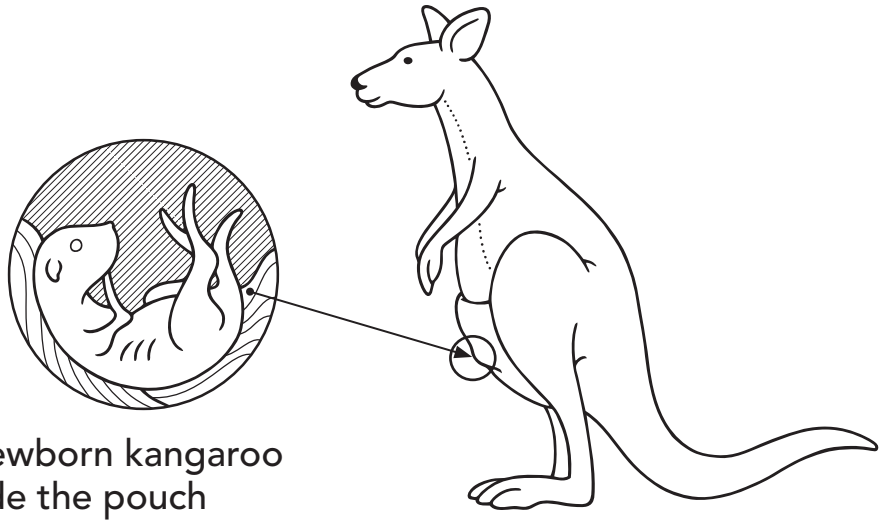
Daily Science
Big Idea 1
WEEK 1

Day 3

Weekly Question

Why do kangaroos carry their babies in pouches?

When a kangaroo is born, it is small and helpless. It is the size of a jelly bean. It crawls through its mother's fur until it reaches her pouch. There, it drinks her milk, stays warm, and grows. The baby is protected inside the pouch. All marsupials spend time in their mothers' pouches.



A newborn kangaroo inside the pouch

Fill in the bubble next to the correct answer.

1. How does the baby kangaroo reach its mother's pouch?

Ⓐ It hops. Ⓑ It crawls. Ⓒ The mother carries it.

2. Why does the baby kangaroo stay in its mother's pouch?

Ⓐ to get milk Ⓑ to stay warm Ⓒ both of these

3. When a kangaroo is born, it is the size of _____.

Ⓐ a jelly bean Ⓑ an apple Ⓒ a cupcake

Name _____

Daily Science
Big Idea 1
WEEK 1

Day 4

Weekly Question

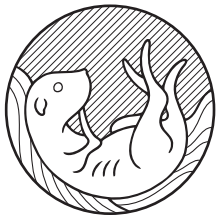
Why do kangaroos carry their babies in pouches?

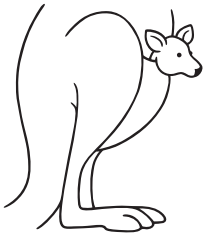
A young kangaroo is called a **joey**. It lives in its mother's pouch for eight months. It leaves the pouch to play and learn, but it returns to the pouch to sleep. A joey leaves its mother's pouch for good when it is ready to be an adult. Then it can reproduce. The cycle of life begins again.

Vocabulary

joey
a young kangaroo

A. Label the pictures to show the stages in a kangaroo's life cycle. Use the words in the box.





_____ _____ _____

adult

joey

baby

B. Read each sentence. Circle **yes** or **no**.

1. Baby kangaroos are called joeys. yes no
2. Babies leave the pouch to sleep and eat. yes no
3. Joeys leave the pouch when they are ready to be adults. yes no

Talk

How is a kangaroo's pouch like a house? How is it different? Tell your partner.

Name _____

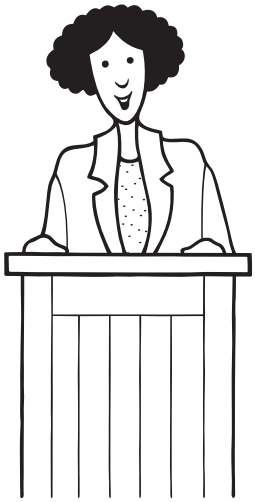
Daily Science
Big Idea 1
WEEK 1

Day 5

Weekly Question

Why do kangaroos carry their babies in pouches?

A. Look at the stages of the human life cycle. Draw arrows to show their order.



Human Life Cycle

B. Complete the sentences. Use the words in the box.

adult	life cycle	mammal	marsupial	reproduce

1. A kangaroo is a special mammal called a _____.
2. All living things have a _____.
3. Humans and horses are both a kind of _____.
4. A mother will _____ and have a baby.
5. A young person will grow into an _____.

All living things have different life cycles.

Week 2

How does a caterpillar turn into a butterfly?

In this week's lesson, students will learn that there are four stages in the life cycle of a butterfly. Each butterfly begins as an egg. A larva, called a caterpillar, hatches from the egg. The caterpillar eats and grows until it eventually pupates. This means that it hangs upside down and forms a cocoon called a chrysalis. Inside its chrysalis, the caterpillar goes through a metamorphosis. Some butterflies change quickly, while others take months to develop. When the butterfly is fully developed, it emerges from the chrysalis.

Day One

Vocabulary: *egg, insect*

Distribute page 15 and introduce the vocabulary. Then read aloud the introduction with students. Point out the picture on the page and direct students to find the egg and circle it. Then direct students to complete activity A. Ask volunteers to read their answers. For activity B, brainstorm with students animals that lay eggs. (e.g., fish, birds, frogs, insects) Distribute crayons and have students complete the activity.

Day Two

Vocabulary: *caterpillar, hatch*

Distribute page 16 and introduce the vocabulary. Then have volunteers read the introduction aloud. Point out the picture of the caterpillar and have students describe it. (looks squishy; has antennae, lots of feet, segmented body; etc.) You may wish to have students color the picture. Then have students complete the activity. Read aloud each sentence as a group, inserting the correct answer.

Day Three

Vocabulary: *chrysalis*

Distribute page 17 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Have students complete activity A. Then read the completed sentences aloud as a group. For activity B, pair students or complete the activity as a group. Prompt students by asking questions such as: **What might happen if a bird found a chrysalis?**

Day Four

Distribute page 18 and read the introduction aloud. Have students complete activity A independently. For activity B, draw a chart on the board similar to the one on the student page. Discuss with students how butterflies and kangaroos are similar (e.g., both grow and change; babies and adults look very different) and how they are different (e.g., kangaroos use a pouch and butterflies use a chrysalis; kangaroos are marsupials and butterflies are insects; baby kangaroos are joeys and butterfly larvae are caterpillars). Have students copy the answers onto their chart.

Day Five

Tell students they will review what they have learned about a butterfly's life cycle. Have them complete page 19. Review the answers together.

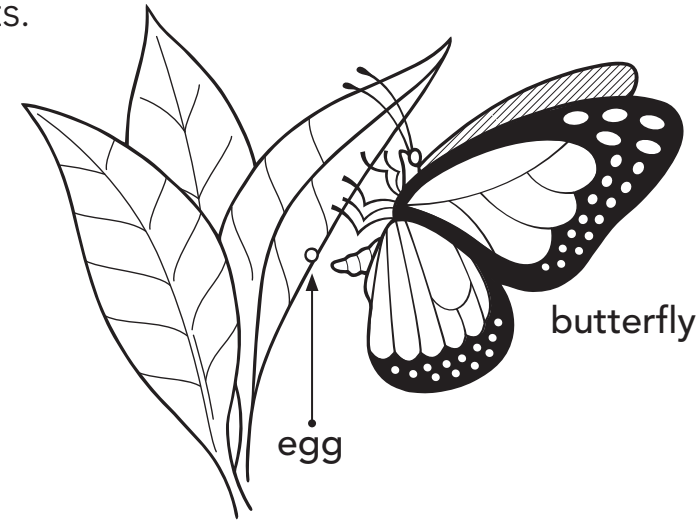
Name _____

Daily Science
Big Idea 1
WEEK 2

Weekly Question

Day 1 How does a caterpillar turn into a butterfly?

A butterfly is an **insect**. Insects have special life cycles. All insects come from **eggs**. The egg is the first stage of a butterfly's life cycle. Adult butterflies lay their eggs on plants.



Vocabulary

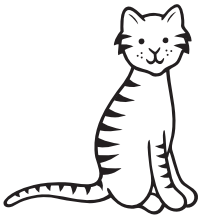
egg
a round object where baby insects and other baby animals start to grow

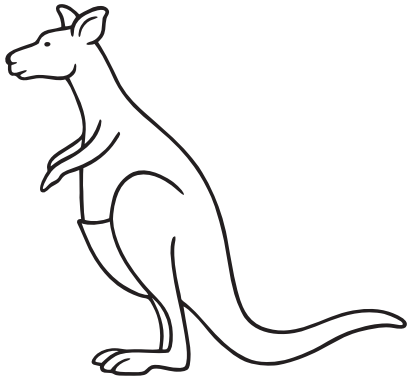
insect
a creature with six legs and three body parts

A. Complete each sentence. Write **egg** or **insect**.

1. A butterfly is a type of _____.
2. The first stage of a butterfly's life cycle is the _____.
3. An adult butterfly will lay its _____ on a plant.

B. Circle the animals that lay eggs. Then color them.

Name _____

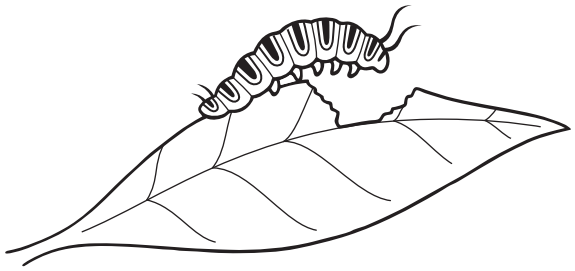
Daily Science
Big Idea 1
WEEK 2

Day 2

Weekly Question

How does a caterpillar turn into a butterfly?

A **caterpillar** is the second stage of a butterfly's life cycle. It **hatches** from a butterfly egg. When the caterpillar hatches, it eats the leaves of the plant. It keeps growing. It grows big and fat!



A caterpillar eats a lot of food.

Vocabulary

caterpillar
the second stage of a butterfly's life cycle

hatch
to be born from an egg

Circle the word that completes each sentence.

1. A caterpillar is the _____ stage in the life cycle of a butterfly.

   first second third

2. A _____ will eat until it grows big and fat.

   egg caterpillar stage

3. A caterpillar eats _____.

   leaves eggs roots

4. Caterpillars _____ from eggs.

   eat fly hatch

Name _____

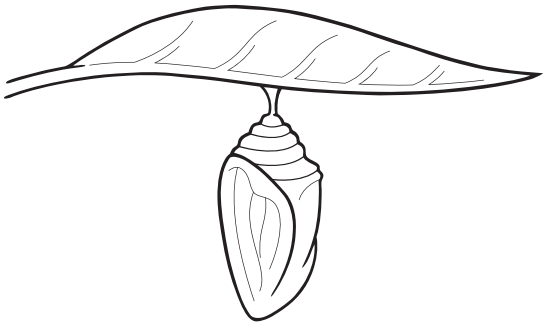
Daily Science
Big Idea 1
WEEK 2

Day 3

Weekly Question

How does a caterpillar turn into a butterfly?

After a caterpillar has eaten and grown big, it finds a place where it will be safe. It becomes a **chrysalis**. A chrysalis is the third stage of a butterfly's life cycle. A chrysalis has a hard shell on the outside. Inside, the caterpillar's body becomes liquid. It begins to change into a butterfly.



chrysalis

Vocabulary

chrysalis
the third stage of a butterfly's life cycle

A. Complete each sentence. Write **before** or **after**.

1. A caterpillar eats and grows big _____ it finds a safe place to hang upside down.

2. A caterpillar becomes a chrysalis _____ it hatches from an egg.

3. A caterpillar finds a safe place _____ it becomes a chrysalis.

B. Why do you think a caterpillar must find a safe place before it becomes a chrysalis? Write your answer.

_____

Name _____

Daily Science
Big Idea 1
WEEK 2

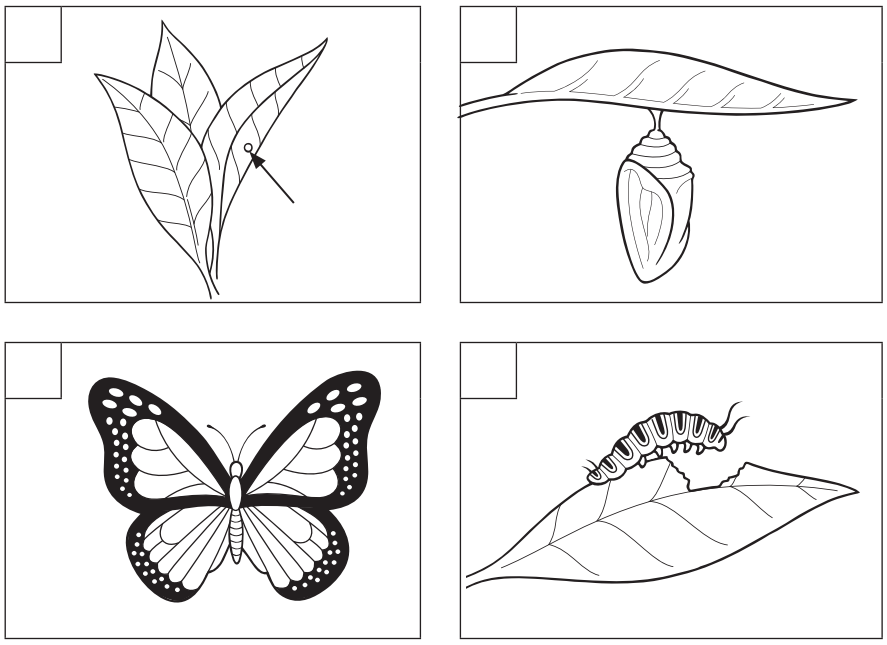
Day 4

Weekly Question

How does a caterpillar turn into a butterfly?

Every butterfly forms inside a chrysalis. Some butterflies form in just a few days. Some take a few months to form. But the final result is always the same. A new butterfly comes into the world!

A. Number the stages of a butterfly's life cycle in the correct order.



B. How are a kangaroo and a butterfly alike? How are they different? Write your answers in the chart.

alike	different

Name _____

Daily Science
Big Idea 1
WEEK 2

Day 5

Weekly Question

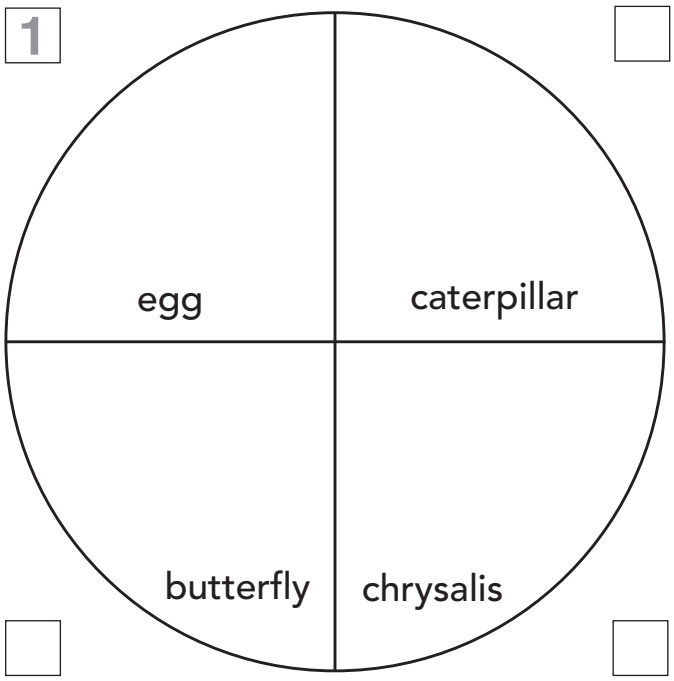
How does a caterpillar turn into a butterfly?

A. Complete the paragraph. Use the words in the box.

butterfly **caterpillar** **chrysalis** **egg**

An _____ is the first stage in the life cycle of a butterfly. A _____ hatches from the egg. It eats and grows until it is ready for the next stage. It becomes a _____. Then it changes its body completely. It becomes an adult _____.

B. Draw the life cycle of a butterfly. Number each stage after **1**.



All living things have different life cycles.

Week 3

How do tiny seeds turn into giant trees?

This week, students will learn that most trees come from seeds. The tiny seed germinates and produces a seedling, which is a small plant. But as the seedling grows into a young tree, it will begin to look more and more like its parent. When a tree reaches maturity, it produces seeds and begins the cycle again. Some trees can develop from offshoots of the original tree, such as from a fallen limb or part of the root. However, this week will focus on the life cycle of a tree, beginning with the seed.

Day One

Vocabulary: *germinates, seeds*

Materials: variety of seeds

Bring a variety of seeds to show students. Have students describe them. (color, size, shape, etc.) Distribute page 21 and introduce the vocabulary. Then read aloud the introduction with students. Have them use the vocabulary words to complete activity A. For activity B, read aloud each question. Refer students back to the introduction and, if needed, help them find the answer. Then have students complete the activity.

Day Two

Vocabulary: *seedling*

Distribute page 22 and introduce the vocabulary word. Then have volunteers read aloud the introduction. Direct students to complete the activities independently. After students have completed activity B, ask volunteers to read each word and its definition aloud.

Day Three

Vocabulary: *sapling*

Distribute page 23 and introduce the vocabulary word. Read the introduction aloud with students. If needed, review properties of a seedling from the previous day. Then ask students different questions about each picture on the page. For example, ask: **Which plant has bark?** (sapling) **Which plant has a shoot?** (seedling) Depending on your students' capabilities, you may want to complete the activity as a group, with students copying responses from the board, or have students complete the activity independently. Then allow students to share their responses.

Day Four

Vocabulary: *code*

Distribute page 24 and introduce the vocabulary word. Relate its meaning to the definition of *code* that students may be more familiar with (a combination of letters or numbers that are used for delivering messages). Then read the introduction aloud with students. Direct students to complete the activities independently. When they have finished, have students read the sentences from activity B with the answers they chose.

Day Five

Tell students they will review everything they have learned about seeds and trees. Have students complete page 25. Then go over the answers together.

Name _____

Daily Science
Big Idea 1
WEEK 3

Day 1

Weekly Question

How do tiny seeds turn into giant trees?

Plants have life cycles, just like animals do. Most trees come from **seeds**. A seed has a hard shell. It protects the baby plant inside. When the baby plant is ready to grow, it **germinates**, or sprouts. This means it pushes out of the seed just like a chick from an egg.

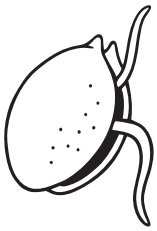
Vocabulary

germinates
sprouts, or starts to grow

seeds
the parts of a plant that make new plants

A. Look at each picture. Use a vocabulary word to complete each sentence.

This is a _____.



This is what a seed looks like when it _____.

B. Read each question. Write your answer.

1. Why do seeds have hard outsides?

_____

2. What does a baby plant do when it germinates?

_____

Name _____

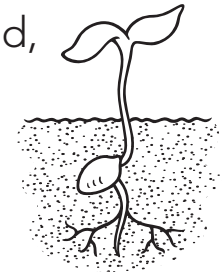
Daily Science
Big Idea 1
WEEK 3

Day 2

Weekly Question

How do tiny seeds turn into giant trees?

When a tree first germinates from a seed, it is called a **seedling**. The seedling needs air, light, and water to grow. It must also be in good soil, or dirt. If the seedling gets all of these things, it will grow bigger.



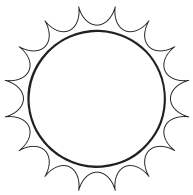
Vocabulary

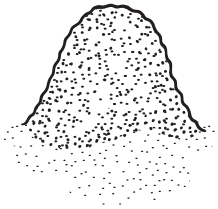
seedling
a baby plant that has just sprouted from a seed

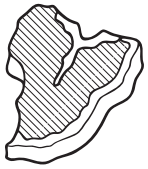
A. Circle the things that a seedling needs to grow.


water


music


light


soil


meat

B. Read each word. Draw a line from the word to its meaning.

1. seed	•	• to start to grow
2. germinate	•	• dirt
3. seedling	•	• a baby plant that has sprouted
4. soil	•	• the plant part that makes new plants

Name _____

Daily Science
Big Idea 1
WEEK 3

Day 3

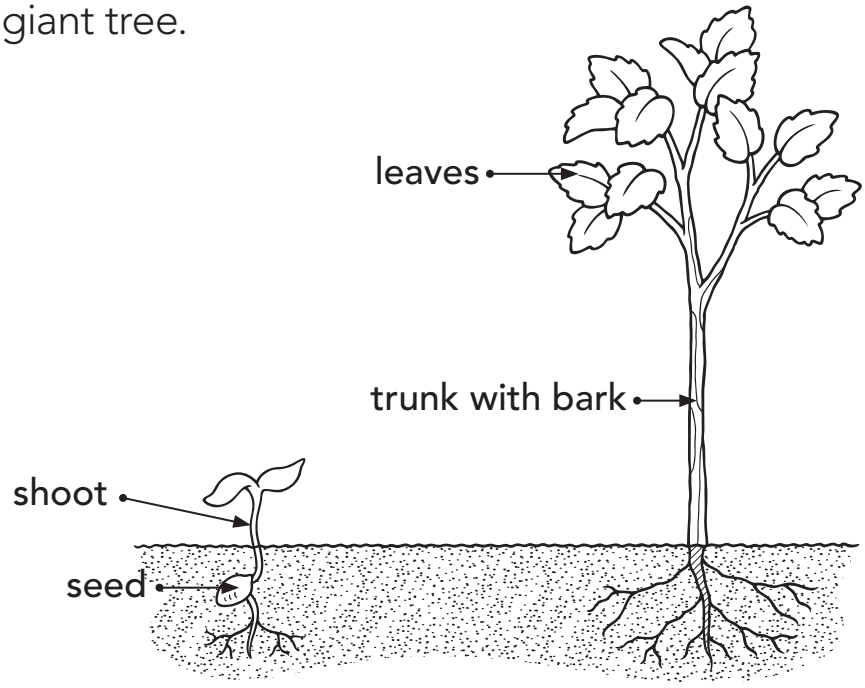
Weekly Question

How do tiny seeds turn into giant trees?

As a seedling grows, it begins to look more like a tree. The shoot, or stem, of the seedling grows taller. The plant is now called a **sapling**. The sapling grows bark, or an outer covering on its trunk. It also grows leaves. It will keep growing bigger and bigger until it is a giant tree.

Vocabulary

sapling
a young tree



Look at the pictures. Write three things about a seedling and three things about a sapling.

Seedling	Sapling
_____	_____
_____	_____
_____	_____

Name _____

Daily Science
Big Idea 1
WEEK 3

Day 4

Weekly Question

How do tiny seeds turn into giant trees?

What makes trees grow taller than other plants? It is because of a built-in **code** that all seeds have. The code tells a seedling what it will become. A pine nut will grow into a pine tree. An acorn will grow into an oak tree. And a small redwood seed will grow into a giant redwood tree. The size of the seed has nothing to do with how tall a tree grows. It's the code inside the seed that is the most important.

Vocabulary

code
a set of instructions

A. Draw lines to match each seed to the tree it grows into.

1. acorn	•	• redwood tree
2. pine nut	•	• oak tree
3. redwood seed	•	• pine tree

B. Circle the words that complete the sentences.

1. Pine nuts will become _____ trees.

redwood pine oak

2. A _____ tells the seed what tree it will become.

code seedling redwood

3. Oak trees come from _____.

redwood seeds pine nuts acorns

Name _____

Daily Science
Big Idea 1
WEEK 3

Day 5

Weekly Question

How do tiny seeds turn into giant trees?

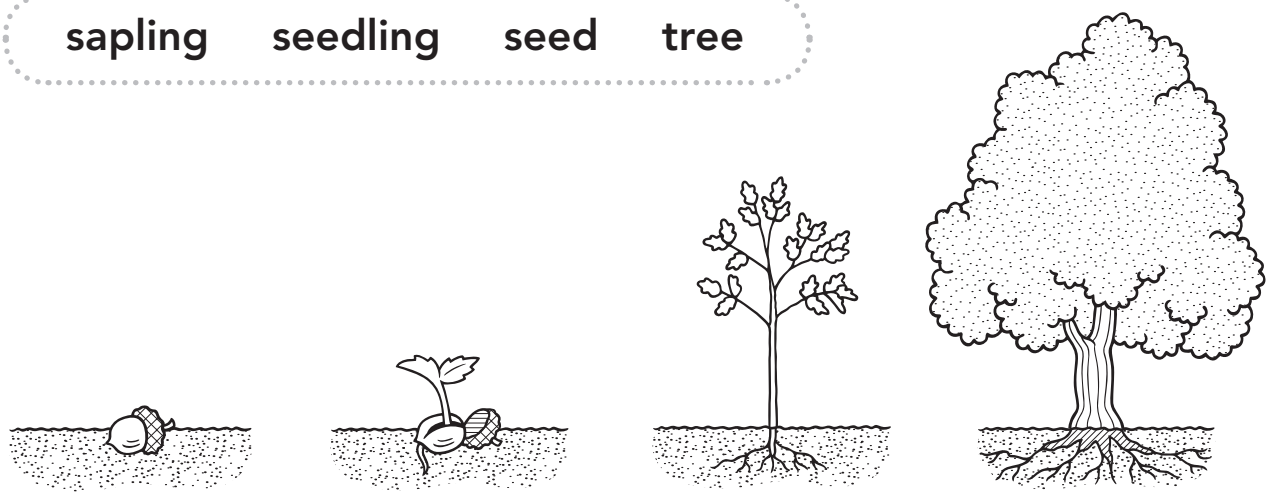
A. Complete each sentence. Use the words in the box.

code **germinates** **seeds** **seedling**

1. An acorn and a pine nut are kinds of _____.
2. When a seed _____, it begins to grow.
3. A _____ is a baby plant.
4. Seeds have a built-in _____ that tells them what to become.

B. Write the name of each stage in a tree's life cycle. Use the words in the box.

sapling **seedling** **seed** **tree**



_____ _____ _____ _____

All living things have different life cycles.

Week 4

Why do some plants have flowers?

Students at this grade do not need to learn the reproductive parts of a flower (stamen, pistil, and so on), but they will learn that all flowers make seeds and some type of fruit. Flowering plants are the most abundant and diverse plants on Earth. A flower is a plant's reproductive part, and it appears after the plant has fully matured. Just like animals, plants have a life cycle. Plants grow from seeds and become mature. Most mature plants create flowers. The flowers produce fruit and grow new seeds. New seeds start the cycle again by becoming new plants.

Day One

Vocabulary: *flower*

Materials: flowers or pictures of flowers

Distribute page 27 and introduce the vocabulary word. Then read the introduction aloud with students. Show the flowers or pictures of flowers you brought. Have students describe the flowers. (shape, color, smell, and so on) If needed, review the parts of a plant (roots, stem, leaves, flower) before distributing crayons and having students complete activity A. For activity B, read the question aloud and have students write their answer.

Day Two

Vocabulary: *pollen*

Distribute page 28 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Point out the pictures on the page and ask students if they have ever seen bees or butterflies around flowers before. Then have students complete activity A independently. For activity B, read each question aloud and have students write their answers.

Day Three

Vocabulary: *fruit*

Distribute page 29 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Point out the chart on the page and help students understand how to read it. Read the name of the first fruit and then ask: **Does it have seeds inside it?** (yes) **Is it a fruit?** (yes) **Then let's write *yes* in the box.** Have students finish the activity on their own. For activity B, read each question aloud and have students circle their answers. For the oral activity, pair students or discuss the answers as a group.

Day Four

Distribute page 30 and read the introduction aloud with students. Then have students look at the pictures in activity A and complete the activity. When students finish, point out that no matter which step in the cycle you start with, the order stays the same. For activity B, have the class answer as a group after a volunteer reads each statement.

Day Five

Tell students they will review everything they have learned about flowers and fruit. Have them complete page 31. Go over the answers together.

Name _____

Daily Science
Big Idea 1
WEEK 4

Day 1

Weekly Question

Why do some plants have flowers?

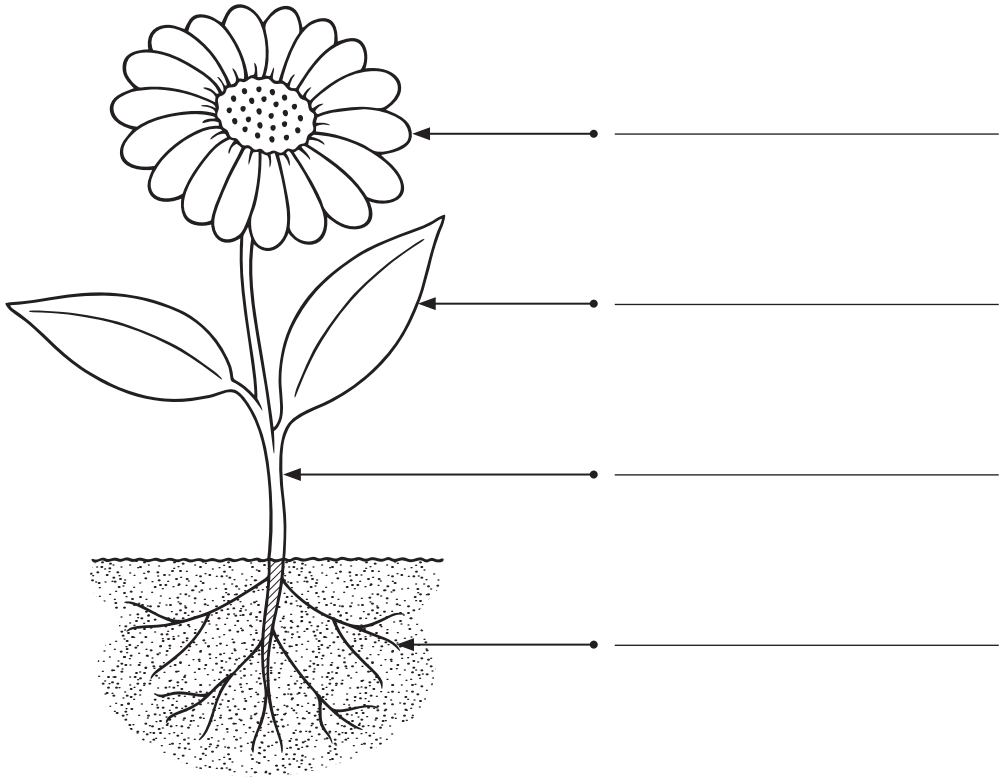
Most plants come from seeds. A seed has a baby plant inside it. But where do seeds come from? Most seeds come from **flowers**. Flowers have a special way of making seeds.

Vocabulary

flower
the part of a plant that makes seeds

A. Label the parts of the plant. Use the words in the box. Then color the picture.

leaf stem flower roots



B. Where do most seeds come from? Write a complete sentence to answer the question.

_____

Name _____

Daily Science
Big Idea 1
WEEK 4

Day 2

Weekly Question

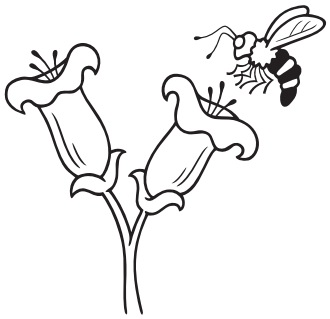
Why do some plants have flowers?

Flowers need **pollen** to make seeds. Pollen is like a dust that flowers make. Sometimes a flower's pollen stays with the flower that made it. Sometimes pollen travels to another flower. Wind can carry pollen. Animals can also take pollen from one flower to another.

Vocabulary

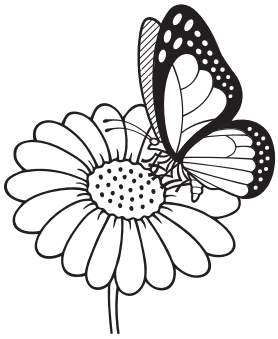
pollen
a special powder made by flowers

A. Look at each picture. Check the box that tells how the pollen is traveling.



❒ in the wind
❒ on an animal

❒ in the wind
❒ on an animal



❒ in the wind
❒ on an animal

B. Write a word from the box to answer each question.

pollen **flowers** **bees**

1. What must a flower have to make seeds? _____
2. What helps pollen travel? _____
3. Where does pollen come from? _____

Name _____

Daily Science
Big Idea 1
WEEK 4

Day 3

Weekly Question

Why do some plants have flowers?

When pollen lands on a special part of a flower, the flower swells. It makes a **fruit**. The flower dies, but the fruit grows. A fruit has seeds inside it. Apples, lemons, and cherries are examples of fruit. They all grow from flowers and have seeds inside them.

Vocabulary

fruit
a part of the plant that has seeds inside it

A. Read the chart. Write **yes** or **no** in the second column to say if each thing is a fruit or not.

	Does it have seeds?	Is it a fruit?
Apple	yes	
Spinach	no	
Tomato	yes	
Watermelon	yes	

B. Read each question. Circle the answer.

1. Which of these is NOT a fruit? pear lettuce tomato

2. Which plant part has seeds? fruit leaf pollen

Talk

Were you surprised that a tomato is really a fruit? Can you think of other "vegetables" that have seeds inside them? Tell your partner.

Name _____

Daily Science
Big Idea 1
WEEK 4

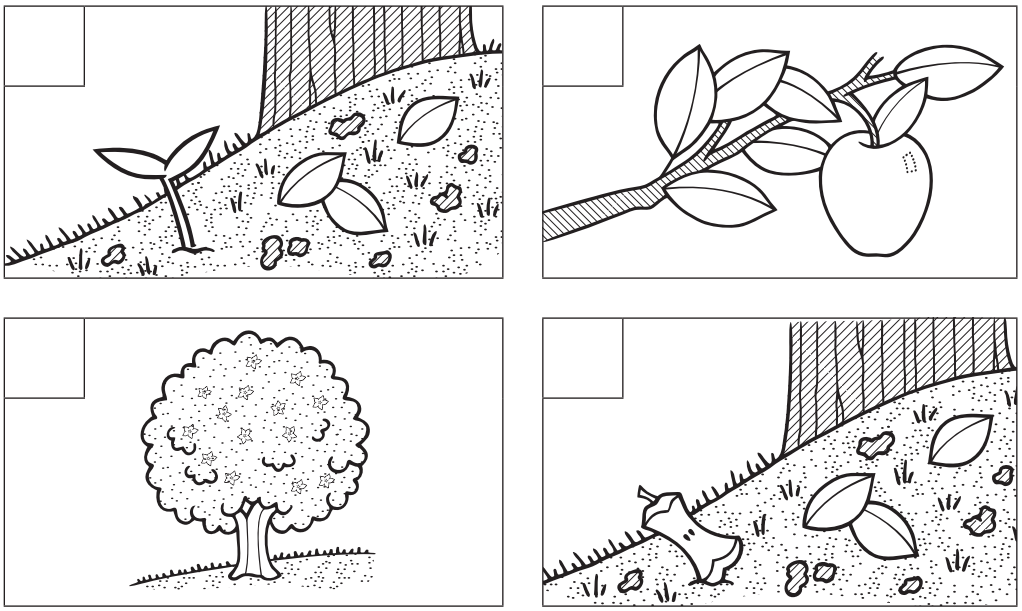
Day 4

Weekly Question

Why do some plants have flowers?

We eat fruit because it tastes good and is good for us. Fruit is also good food for the seeds inside it. When a seed germinates, the fruit gives the seed the food it needs to keep growing. The fruit breaks down into food for the new plant. So, without flowers, there would be no fruit. And without fruit, there would be no seeds.

A. Number the pictures in the correct order.



B. Read each sentence. Write **true** or **false**.

1. Fruit can grow without flowers. _____
2. Sometimes seedlings use fruit as food. _____
3. Seeds make fruit before they germinate. _____

Name _____

Daily Science
Big Idea 1
WEEK 4

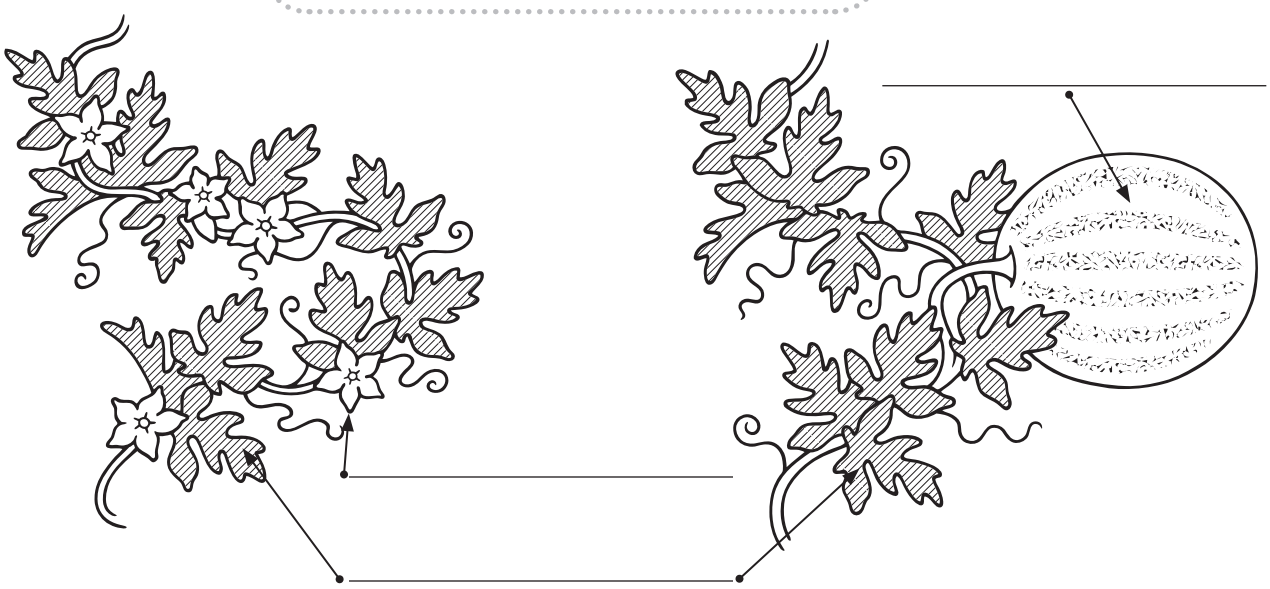
Day 5

Weekly Question

Why do some plants have flowers?

A. Label the parts of each plant below. Use the words in the box.

flower **fruit** **leaves**



B. Complete the paragraph. Use the words in the box.

flowers **fruit** **pollen**

Many plants grow pretty _____. When a flower gets _____ on it, a part of the flower begins to swell. The flower grows a fruit. New seeds are inside the _____. Now a new plant can grow.

Name _____

Daily Science
Big Idea 1
WEEK 5

Unit Review

Comprehension

Life Cycles

Read each question. Fill in the bubble next to the correct answer.

1. Which of these does NOT have a life cycle?
- Ⓐ butterfly
- Ⓑ pine tree
- Ⓒ mountain

2. The first stage of the life cycle of a butterfly is _____.
- Ⓐ an egg
- Ⓑ a chrysalis
- Ⓒ a caterpillar

3. Plants have flowers so they can make _____.
- Ⓐ seeds
- Ⓑ stems
- Ⓒ leaves

Read each sentence. Circle **true** or **false**.

4. A big tree always grows from a big seed. **true** **false**

5. Pollen helps plants make flowers. **true** **false**

6. Mammals have hair and feed their babies milk. **true** **false**

Name _____

Daily Science
Big Idea 1
WEEK 5

Unit Review

Vocabulary

Fill in the Blanks

Use the words in each box to complete the sentences.

life cycle **reproduces**

1. Every kind of animal and plant is born, grows, _____,
and dies. Every living thing has its own kind of _____.

joey **marsupials**

2. Mammals that have pouches are called _____.
A _____ is a baby kangaroo.

caterpillar **chrysalis**

3. A butterfly hatches from an egg and grows
into a _____. It then makes a
_____ and changes into a butterfly.

seed **germinates**

4. A _____ has a baby plant inside.
The baby plant grows when the seed _____.

Name _____

Daily Science
Big Idea 1
WEEK 5

Unit Review

Visual Literacy

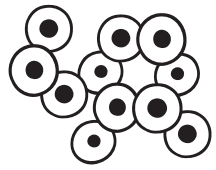
Life Cycles

You know that every plant and animal has a life cycle, but living things aren't all the same. They grow and change in different ways. The pictures below show the life cycle of a frog.

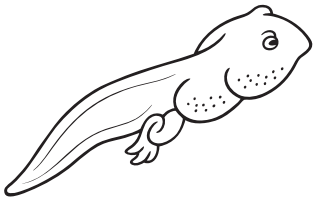
Look at each picture and read its caption. Then number the pictures in the correct order. The first one has been done for you.

The Life Cycle of a Frog

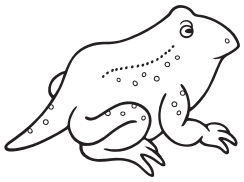
1



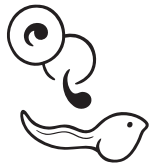
A female frog lays her eggs.



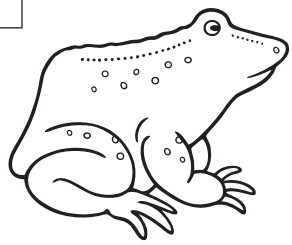
The tadpole begins growing legs.



The tadpole's legs get longer and its tail gets shorter.



A tadpole hatches from an egg.



The tadpole becomes an adult frog.

Name _____

Daily Science
Big Idea 1
WEEK 5

Unit Review

Hands-on Activity

The Life Cycle of a Pea

You can watch pea seeds germinate and grow into plants with flowers. When the flowers make pea pods, open them. The cycle will be complete!

What You Need

- pea seeds
- soil
- a pot
- measuring tape

1. Soak two or three pea seeds in water overnight.
2. Plant the pea seeds in a pot filled with soil.
3. Water it and place the pot in a warm and sunny place.
4. Water it whenever the soil becomes dry.
5. As the plant grows, measure it. Record what you see growing.

What Did You Discover?

Fill in the chart.

	How tall?	How many flowers?	How many pods?
Week 1			
Week 3			
Week 5			
Week 7			
Week 9			

Plants and animals look a lot like their parents.

Key Concepts
Parents and Offspring

National Standard
Plants and animals closely resemble their parents.

At the beginning of second grade, students should recognize that offspring resemble their parents. This Big Idea teaches students that:

- animals reproduce their own kind;
- plants reproduce their own kind;
- offspring are very much, but not exactly, like their parents and each other; and
- plants can be made to reproduce offspring with certain traits.

Teacher Background

All offspring receive a mix of traits from both parents. Some traits are determined by genes that are dominant or recessive. Brown eyes, for example, are dominant, while blue eyes are recessive. It is more likely a child will show the dominant trait, but in a large enough family, some offspring will display the recessive trait.

Within every species, each plant or animal has some characteristics in common. This is because all members in a species share some genes. But every individual in a species looks slightly different because of variation within these shared genes. Dogs and wolves are similar because they share some of the same genes. But cats and birds have much fewer shared genes—they are part of two different species.

The more humans learn about genes, the more we are able to influence the traits of plants, such as by producing tomatoes that have thicker skin or breeding seedless grapes. Most of the diverse plants we use today come from centuries of farming practice, but scientists are still creating new crops and plants.

For specific background information on each week's concepts, refer to the notes on pp. 38, 44, 50, and 56.

Unit Overview

WEEK 1: What's the difference between a fox and a wolf?

Connection to the Big Idea: Students learn that mammals have traits that are specific to each kind of animal.

Students learn how wolves and foxes are similar because they are mammals, but also different because they are different species. Students then learn that adult wolves and foxes pass down their traits to their babies.

Content Vocabulary: *kits, mammals, pack, pups, related, traits*

WEEK 2: Why can't an apple tree grow oranges?

Connection to the Big Idea: Students learn that fruits have specific traits and make more of their own kind.

Students first learn about the traits of apples and oranges and how the fruits are similar and different. Students then examine the traits of various citrus fruits and varieties of apples, finally learning that oranges and apples are not the same species and therefore cannot reproduce with each other.

Content Vocabulary: *citrus, species, variety*

WEEK 3: How can a spotted cat have striped kittens?

Connection to the Big Idea: Students learn that kittens receive a mix of traits from each parent.

Students first learn that a kitten will receive some traits from its mother and some from its father. Students then learn that kittens may have certain traits, such as the way they behave, that may not resemble their parents.

Content Vocabulary: *behave, offspring, resemble*

WEEK 4: Why don't all grapes have seeds?

Connection to the Big Idea: Students learn that farmers can choose traits for food that they grow through selective planting.

Students learn how wild grapes used to have very different traits from the grapes we eat today. They learn that farmers selected the grapes with the traits they wanted and continued to select and grow them over and over again.

Content Vocabulary: *crops, farmed, seedless*

WEEK 5: Unit Review

You may choose to do these activities to review concepts of heredity.

p. 62: Comprehension Students answer multiple-choice questions about key concepts from the unit.

p. 63: Vocabulary Students complete a crossword puzzle using key vocabulary.

p. 64: Visual Literacy Students match parents to their offspring.

p. 65: Hands-on Activity Students "breed" a new animal. Instructions and materials needed for the activity are listed on the student page.

Week 1

What's the difference between a fox and a wolf?

Plants and animals look a lot like their parents.

Second-grade students can distinguish different animals by the way they look, act, and sound, but students may not fully understand what makes animals different. This week's lesson will expose students to the concept of a species by comparing and contrasting how wolves and foxes are similar and different. Students will also learn that the similarities and differences between a wolf and a fox are determined by traits that are passed down from parents to their offspring.

Day One

Vocabulary: *mammals, related*

Distribute page 39 and introduce the vocabulary. Invite students to name some people who are related to them. Then read the introduction aloud with students. Say: **Wolves and foxes have some things in common because they are both mammals, but they are still different.** Discuss with students different kinds of mammals. (dogs, cats, mice, humans, etc.) If necessary, review the characteristics of mammals before students complete activity A on their own. Then have students complete activity B. Go over the answers together.

Day Two

Vocabulary: *pack, traits*

Distribute page 40 and introduce the vocabulary. Have students list examples of their own traits. (blue eyes, right-handed, and so on) Then have volunteers read the introduction. Tell students they will use a chart to organize information about foxes and wolves in order to compare and contrast their traits. Have students complete activity A, assisting as needed. For activity B, read aloud each sentence as a group and direct students to write their answers.

Day Three

Vocabulary: *kits, pups*

Distribute page 41 and introduce the vocabulary. Then have volunteers read the introduction aloud. Distribute crayons and have students complete activity A. For activity B, help students find their answers in the introduction and underline them. Then complete the oral activity together. List students' responses on the board.

Day Four

Distribute page 42 and read the introduction aloud. Have students finish activity A independently. For activity B, write *fox* and *wolf* on the board. Have students name traits for you to write under each animal's name. Help students understand how these traits can be beneficial. (e.g., a fox lives alone, so it can live in small places; wolves live together to protect each other)

Day Five

Tell students they are going to review everything they have learned about wolves and foxes. Then have students complete page 43. Go over the answers together.

Name _____

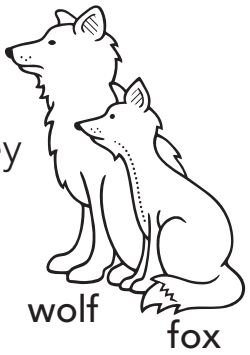
Daily Science
Big Idea 2
WEEK 1

Day 1

Weekly Question

What's the difference between a fox and a wolf?

A fox and a wolf are both **mammals**. They look a little bit alike. They both have furry coats, bushy tails, and long noses. They both have claws and sharp teeth. But these two animals are not **related**.



A. Read each question. Write **yes** or **no**.

1. Do mammals have hair? _____
2. Do mammals lay eggs? _____
3. Do mammals have a backbone? _____

B. Read each question. Circle the correct answer.

1. What do wolves and foxes have in common?

   furry coats sharp teeth

   claws all of these

2. Which pair of words name two things that are related?

   fox, wolf brother, sister

   teacher, student frog, cat

Vocabulary

mammals
warmblooded animals with a backbone and hair or fur

related
in the same family

Name _____

Daily Science
Big Idea 2
WEEK 1

Day 2

Weekly Question

What's the difference between a fox and a wolf?

Wolves have certain **traits**. For example, wolves grow very large. An adult wolf can weigh 140 pounds and be over 3 feet tall. Wolves live in **packs**, or groups, of 6 to 10 wolves.

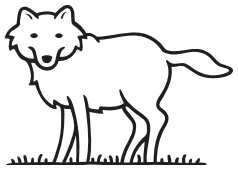
Foxes have different traits. They don't grow very large. A fox can only weigh up to 30 pounds. It grows to be about 1 foot tall. Foxes live by themselves.

Vocabulary

pack
a group of certain animals that live together

traits
features of something

A. Look at the chart below. Fill in the missing traits.



	Wolf	Fox
Weight	140 pounds	
Height		1 foot tall

B. Complete each sentence. Write **wolf** or **fox**.

1. A _____ lives alone.
2. A _____ can weigh 140 pounds.
3. A _____ pack can have 8 animals in it.
4. An adult _____ is about 1 foot tall.

Name _____

Daily Science
Big Idea 2
WEEK 1

Day 3

Weekly Question

What's the difference between a fox and a wolf?

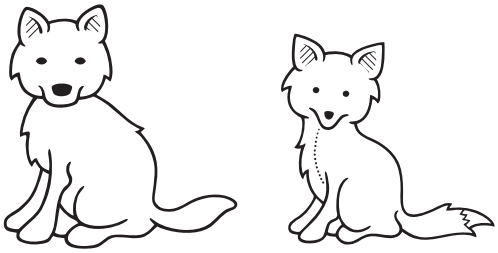
Wolves have babies called **pups**. Foxes have babies called **kits**. A pup can be gray, brown, white, or black. A kit can be red, silver, gray, or white. Pups look like little wolves. Kits look like little foxes. The babies look a lot like their parents.

Vocabulary

kits
baby foxes

pups
baby wolves

A. Look at the pictures. Complete each sentence. Then color the pictures.



pup kit

1. A baby wolf is called a _____.

2. A baby fox is called a _____.

B. Read each question. Circle the correct answer.

1. Which color can a kit NOT be?

   red brown white gray

2. Which color can a pup NOT be?

   gray white black red

Talk

What are names for other baby animals? Name as many as you can.

Name _____

Daily Science
Big Idea 2
WEEK 1

Day 4

Weekly Question

What's the difference between a fox and a wolf?

Baby wolves act like wolves. Baby foxes act like foxes. Every wolf and every fox will always be like other wolves and foxes. But a wolf and a fox will always be different from one another. Being different gives them each a better chance of living in the wild. They don't have to fight each other for food or places to sleep.

A. Think about what you have learned about wolves and foxes. Use what you know to choose the animal that each sentence tells about. Circle your answer.

1.	I like to live with other animals like me.	wolf	fox
2.	I can fit inside small spaces.	wolf	fox
3.	I like to hunt big animals.	wolf	fox
4.	I am shy around other animals.	wolf	fox

B. Write one way a wolf and a fox are different. Then tell how these different traits help each animal survive.

_____

_____

_____

Name _____

Daily Science
Big Idea 2
WEEK 1

Day 5

Weekly Question

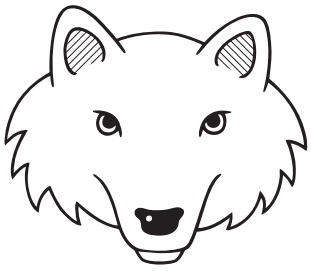
What's the difference between a fox and a wolf?

A. Complete each sentence. Use the words in the box.

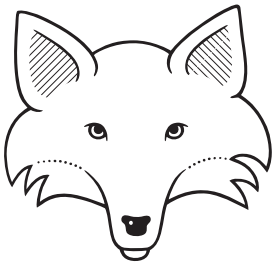
kit **traits** **pup** **related**

1. The _____ of an animal describe how it looks and acts.
2. A baby fox is called a _____.
3. Wolves and foxes are not _____.
4. A _____ is a baby wolf.

B. Draw lines to match the traits to the animal they go with. Some traits might go with both animals.



wolf •



fox •

- weighs 30 pounds
- lives in a pack
- is a mammal
- grows 3 feet tall
- has kits
- has pups
- has a long nose and furry tail

Plants and animals look a lot like their parents.

Week 2

Why can't an apple tree grow oranges?

Plants, just like animals, have their own characteristics. Apples and oranges are both fruits but are actually very different. Oranges belong to the citrus family. They are related to lemons, limes, and grapefruits. Apples are related to the crab apple and are part of the rose family.

In this week, students will revisit the concept of traits from last week, but will apply that concept to plants. Students will see the similarities and differences between apples and oranges and gain a broader understanding of how living things are classified based on their traits.

Day One

Materials: apple and orange

Show students an apple and an orange and brainstorm as a class the different traits of each fruit. Distribute page 45 and review the definition of *traits*. Then read the introduction aloud with students. Have students complete activity A independently. For activity B, pair students or discuss as a group before students write their answers. Refer back to the traits you listed at the beginning if students have trouble thinking of an answer.

Day Two

Vocabulary: *citrus*

Distribute page 46 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Point out the chart and have a volunteer reach each column. Then have students complete activity A independently. Have students complete activity B and ask volunteers to read each sentence aloud.

Day Three

Vocabulary: *variety*

Distribute page 47 and introduce the vocabulary word. Then read the introduction aloud with students. Invite students to name other examples of fruits that come in different varieties. (pears, grapes, and so on) Then call attention to the apple varieties shown on the page, and have volunteers read their descriptions. Distribute crayons and have students complete the activity independently.

Day Four

Vocabulary: *species*

Have students recall the differences between a fox and a wolf from the previous week. Then distribute page 48 and introduce the vocabulary word. Have volunteers read the introduction aloud. To expand on the concept of species, say: **A species is one kind of a plant or animal. A goldfish is a species. A cat is a species. An apple tree is a species, a wolf is a species, and so are foxes and orange trees.** Have students complete the activities. Provide assistance as needed.

Day Five

Tell students they will review everything they have learned about apple and orange trees. Have them complete page 49. Go over the answers together.

Name _____

Daily Science
Big Idea 2
WEEK 2

Day 1

Weekly Question

Why can't an apple tree grow oranges?

Apples and oranges have some common traits. Both are fruits that grow on trees. Both can be sweet or a little sour. Both have seeds.

But apples and oranges have many different traits. Apples are red, green, or yellow. But oranges are always orange. Also, apples can grow in cold weather, while oranges need warm weather to grow.

A. Fill in this chart. Write **yes** or **no** if the fruit has the trait.

	Apple 	Orange 
Grows on trees		
Comes in many colors		
Grows in cold weather		
Has seeds		

B. Tell one more way that apples and oranges are alike and one more way that they are different.

Alike: _____

Different: _____

Name _____

Daily Science
Big Idea 2
WEEK 2

Day 2

Weekly Question

Why can't an apple tree grow oranges?

Oranges are part of the **citrus** family. They are related to limes, lemons, and grapefruits. Fruit from an orange tree can mix with fruit from a grapefruit tree. The new fruit is a cross between an orange and a grapefruit. It is called an orangelo!

Orange	Grapefruit	Orangelo
orange skin	yellow skin	yellow skin
easy to pull apart	hard to pull apart	easy to pull apart
sweet	sour	sweet

Vocabulary

citrus
fruits with thick rinds that are sweet or sour

A. Look at the chart. Answer the questions.

1. What is one trait an orangelo shares with an orange?

_____

2. What is one trait an orangelo shares with a grapefruit?

_____

B. Complete the sentences. Use the words in the box.

citrus

trait

1. An orange is a _____ fruit.
2. One _____ of oranges is thick skin.
3. Fruits from different _____ trees can mix.

Name _____

Daily Science
Big Idea 2
WEEK 2

Day 3

Weekly Question

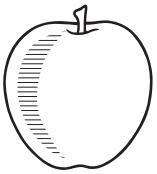
Why can't an apple tree grow oranges?

While oranges, lemons, and other citrus fruits are closely related, they are still different kinds of fruit. All apples, however, are the same kind of fruit. Apples have only slightly different traits from one another. The different kinds of apples are called **varieties**.

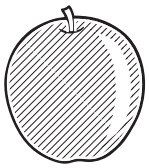
Vocabulary

variety
a kind or type of something

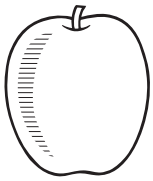
Look at the different varieties of apples. Read about each one. Color the apples. Then answer the questions.



Granny Smith:
green, sour, good for baking



Fuji:
red, very juicy, sweet, crisp



Golden Delicious:
yellow, very sweet, bruises easily

1. Which variety is red and crispy? _____
2. Which variety would be good to make pie? _____
3. Which variety makes good juice? _____
4. Which variety might be bad for carrying in your backpack? _____

Name _____

Daily Science
Big Idea 2
WEEK 2

Day 4

Weekly Question

Why can't an apple tree grow oranges?

Just as a wolf and a fox are not related, an orange tree and an apple tree are not related. The two fruits are different **species**. This means that fruit from an orange tree cannot grow on an apple tree.

Vocabulary

species
a group of living things that have many traits in common

A. Complete the sentences. Circle the correct answer.

1. Oranges and apples are different _____.

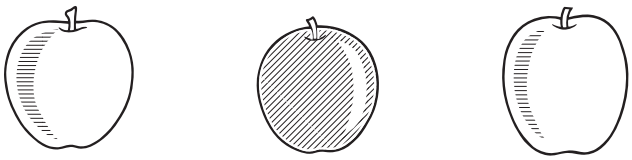
   citrus varieties species

2. Different species do NOT have many of the same _____.

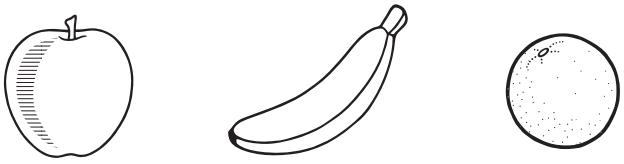
   traits fruits animals

B. Look at the pictures. Use the words from the box to fill in the blanks.

varieties
species



1. These are different _____ of apples.



2. These are different _____ of fruit.

Name _____

Daily Science
Big Idea 2
WEEK 2

Day 5

Weekly Question

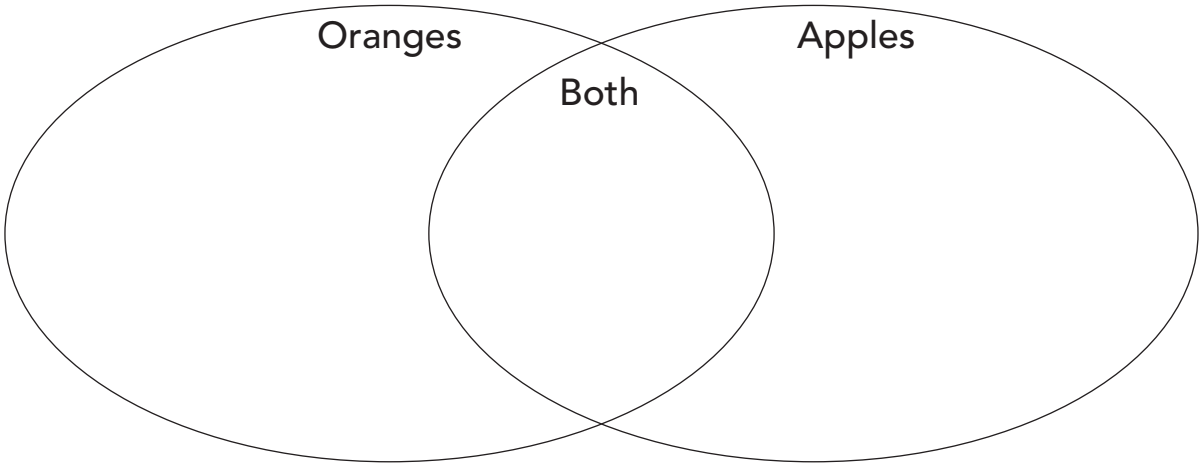
Why can't an apple tree grow oranges?

A. Complete each sentence. Use the words in the box.

citrus **species** **varieties**

1. A red apple and a green apple are the same _____.
2. Lemons and limes are _____ fruits.
3. Fruit from a _____ tree cannot grow on an apple tree.
4. Sweet and sour apples are different _____ of apples.

B. Write one trait that an apple and an orange share. Then, for each fruit, write one trait that is NOT shared.



Plants and animals look a lot like their parents.

Week 3

How can a spotted cat have striped kittens?

In every species, some traits are always the same, and some traits can be different. For example, all humans have hair, but the hair can be different colors or textures. Our traits depend on the different genes we receive from our parents. In cats, the traits for fur color and patterns are determined by different traits between the mother and father cat. A cat's fur can be orange, gray, black, or white. It can be long or short. It can be coarse or fluffy. A cat with spots can have kittens with stripes if the gene for stripes is present in either the mother or the father cat.

In this week's lesson, students won't learn about genes, but they will learn that offspring receive some traits from each parent. They will also learn that no two siblings are exactly alike, though they share many traits that cause them to resemble one another.

Day One

Vocabulary: *offspring, resemble*

Invite students to tell whom they look most like in their family. Ask: **What features do you have in common with your relatives?** Distribute page 51 and introduce the vocabulary words. Then have volunteers read the introduction aloud. Have students complete the activities, and provide assistance as needed.

Day Two

Distribute page 52 and have volunteers read the introduction aloud. Have students complete the first activity independently. Then have volunteers read aloud each sentence, reviewing the answers as a group. Pair students for the oral activity or complete it as a group.

Day Three

Vocabulary: *behave*

Distribute page 53 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Discuss different behavioral traits that students have observed in their pets or in animals they know about. Have students complete the activities independently. Then review the answers together.

Day Four

Distribute page 54 and read the introduction with students aloud. If necessary, model for students how the traits can be combined by writing the combinations on the board. Have students complete the activities. Then review the answers together.

Day Five

Tell students they are going to review everything they have learned about how offspring resemble their parents and each other. Then have students complete page 55. Go over the answers together.

Name _____

Daily Science
Big Idea 2
WEEK 3

Day 1

Weekly Question

How can a spotted cat have striped kittens?

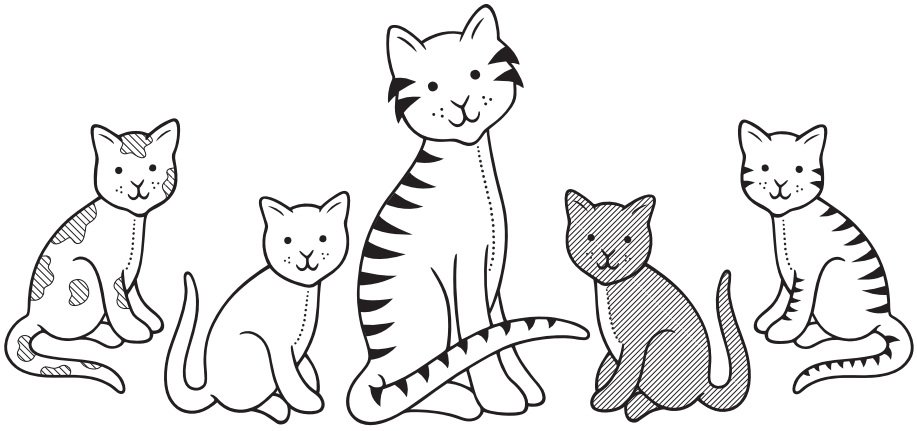
When an animal has **offspring**, or babies, they are always the same kind of animal as the parent. A dog has puppies and a cat has kittens. Most young animals **resemble** their parents. They look like the animal they will grow up to be.

Vocabulary

offspring
animals or plants that come from parents

resemble
to look very much, but not exactly, like something else

A. Look at the picture. Circle the kitten that most resembles its mother.



B. Look at the picture again. In what ways do all of the kittens resemble their mother? Circle your answers.

same size same color four legs pointy ears

C. Read each question. Write the answer.

1. What are baby cats called? _____
2. What are baby dogs called? _____
3. What is any baby animal called? _____

Name _____

Daily Science
Big Idea 2
WEEK 3

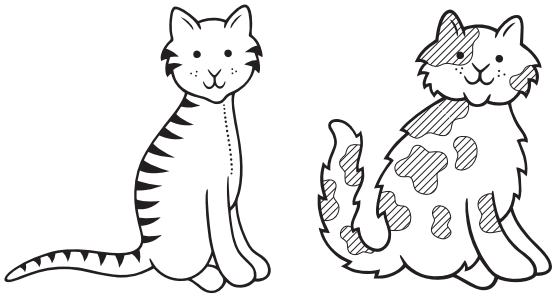
Day 2

Weekly Question

How can a spotted cat have striped kittens?

Offspring receive some traits from their father and some from their mother. So, offspring look a little like each parent. But different kittens with the same parents may not look like each other. That's because each kitten gets different traits from each parent.

Look at the picture. Then read each sentence. Write yes or no.



1. Both cats have spots on their fur. _____
2. The cats have hair that is the same length. _____
3. One cat is larger than the other. _____
4. One cat has a fluffy tail. _____

Talk

Imagine that the cats in the picture above came from the same parents. What do you think the parents look like? Tell your partner.

Name _____

Daily Science
Big Idea 2
WEEK 3

Day 3

Weekly Question

How can a spotted cat have striped kittens?

Offspring are not always exactly like their parents. They might grow to be bigger or smaller than their parents. They may run faster or jump higher. Offspring may **behave** differently, too. For example, they may be more brave or more quiet than their parents.

Vocabulary

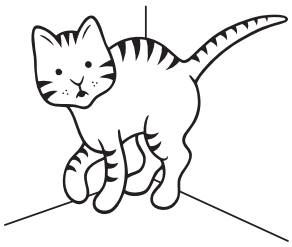
behave
to act a certain way

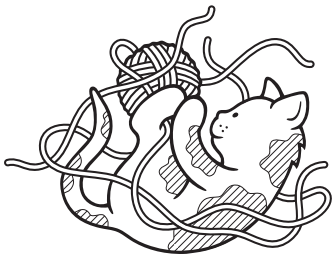
A. Complete the sentence. Write the missing word.

An animal may look and _____ differently than its parents.

B. Look at the kittens. Then read the traits in the box. Under each kitten, write the traits that tell how the kitten is behaving.

playful	friendly	shy
calm	scared	silly





_____ _____ _____

_____ _____ _____

Name _____

Daily Science
Big Idea 2
WEEK 3

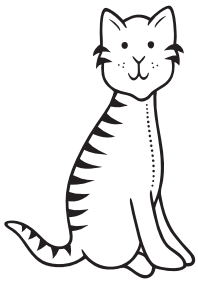
Day 4

Weekly Question

How can a spotted cat have striped kittens?

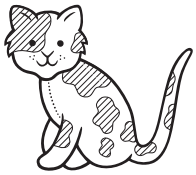
When parents give traits to their offspring, the traits may mix in different ways. Imagine a mother cat with fluffy striped fur and a father cat with short spotted fur. Their babies could have fluffy striped fur, fluffy spotted fur, short striped fur, or short spotted fur!

A. Look at the pictures. Then answer the questions.



mother cat

father cat



kitten

1. Which trait did the kitten get from its mother? Circle it.

long fur short tail stripes

short fur long tail spots

2. Which traits did the kitten get from its father? Circle them.

long fur short tail stripes

short fur long tail spots

B. Draw another kitten that could come from the mother and father above.

Name _____

Daily Science
Big Idea 2
WEEK 3

Day 5

Weekly Question

How can a spotted cat have striped kittens?

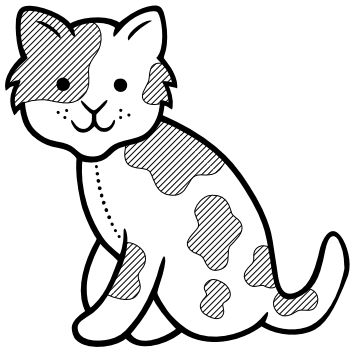
A. Complete the paragraph. Use the words in the box.

behave **resemble** **traits**

Brothers and sisters _____ their parents and each other. They share many of the same _____. But they may _____ differently than their parents.

B. Draw lines from the kitten to the traits it received from each parent.

Mother's Traits		Father's Traits
short fur	•	• long fur
long, skinny face	•	• round, flat face
short tail	•	• long tail
stripes	•	• spots



Plants and animals look a lot like their parents.

Week 4

Why don't all grapes have seeds?

In this week's lesson, students will learn how grapes can be grown to bring out certain traits, such as being sweeter or having fewer seeds. "Seedless" grapes actually do have seeds, but the seeds are small and undeveloped. A genetic mutation prevents them from forming hard outer coats like normal seeds do. Without fully formed seeds, the grapes cannot reproduce themselves. Growers grow them with cuttings so that the new grapevines are clones of the vines they were cut from. In fact, most highly valued fruit crops are grown this way today.

Day One

Vocabulary: *farmed*

Distribute page 57 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Explain that people ate wild grapes hundreds of years ago, and that these grapes were very different from the grapes we eat today. Have students complete activity A independently. For activity B, read aloud the traits in the box and assist students with completing the chart.

Day Two

Distribute page 58 and have volunteers read the introduction aloud. Then have students complete activity A. For activity B, have students make their choice and then ask volunteers to talk about their choices.

Day Three

Vocabulary: *crops*

Materials: pictures of farms (optional)

If possible, bring in pictures of farms. Distribute page 59 and introduce the vocabulary word before having volunteers read the introduction. Then show students the pictures. Say: **The fruits and vegetables we buy at the store are grown on farms as crops.** Have students brainstorm different crops and then complete the activities. Go over the answers together.

Day Four

Vocabulary: *seedless*

Students may be curious about how grapes without seeds grow. Explain briefly that the parts of the vine that grow grapes without seeds are grafted (cut and attached) to new, healthy grapevines. The grafted vines then produce seedless grapes. Distribute page 60 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Briefly explain how jelly is made (mashed grapes and sugar are heated together) and how raisins are made (grapes are heated and dried for a long time). Then guide students through the activities.

Day Five

Tell students they will review everything they have learned about how people grow fruits and choose traits. Have students complete page 61. Go over the answers together.

Name _____

Daily Science

Big Idea 2

WEEK 4

Day 1

Weekly Question

Why don't all grapes have seeds?

All fruit that we eat today once started out as wild fruit. Wild grapes had different traits than grapes grown on farms today. Most wild grapes were smaller than **farmed** grapes. Wild grapes had more seeds. They were more sour, too.

Vocabulary

farmed
grown on a farm

A. Complete the sentence. Write the word.

Wild grapes and _____ grapes have different traits.

B. Fill in the chart. Use the words in the box.

sweet	**sour**	**big**
small	**many**	**few**

	Wild grapes	Farmed grapes
Number of seeds		
Size of grapes		
Taste		

Name _____

Daily Science
Big Idea 2
WEEK 4

Day 2

Weekly Question

Why don't all grapes have seeds?

When farmers started planting grapes, they took seeds from the biggest and sweetest wild grapes. Some of the new grapes that grew were small or sour, but others were big and sweet. Some of the grapes even had fewer seeds. People liked those grapes. So farmers planted those big, sweet grapes again and again.

A. Read each question. Fill in the bubble next to the correct answer.

1. Why do you think farmers wanted to plant big, sweet grapes?

   Ⓐ They wanted to learn how to grow grapes.

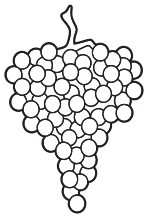
   Ⓑ They liked to eat bigger, sweeter grapes.

2. Why do you think farmers chose grapes with fewer seeds?

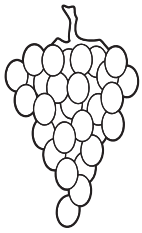
   Ⓐ The grapes with fewer seeds were easier to eat.

   Ⓑ The seeds made people sick.

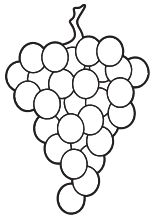
B. Look at the grapes. Circle the ones you think farmers would want to grow again.



sour, small, full of seeds



sweet, large, few seeds



sour, large, full of seeds

Name _____

Daily Science
Big Idea 2
WEEK 4

Day 3

Weekly Question

Why don't all grapes have seeds?

By planting the seeds from the best grapes from each batch over and over again, farmers created new **crops**. These new grapes didn't have any of the traits of wild grapes.

Farmers grow other crops besides grapes. Corn, wheat, and bananas are a few of the crops that are grown on farms.

Vocabulary

crops
foods or plants that are planted and used

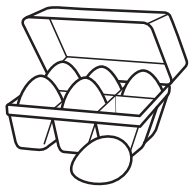
A. Complete the sentences. Use the words in the box.

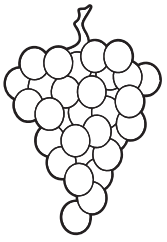
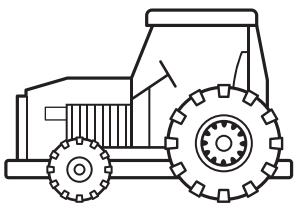
crops grapes

1. Farmers kept the _____ that grew big and sweet.

2. Farmers grow new _____ so that people have many kinds of food to eat.

B. Look at the pictures below. Which ones are crops? Circle them.



C. Name one more crop that farmers grow. _____

Name _____

Daily Science
Big Idea 2
WEEK 4

Day 4

Weekly Question

Why don't all grapes have seeds?

Farmers grow crops of different grapes for different reasons. They grow grapes that are big and juicy for grape juice. They grow grapes that keep well to make raisins. Farmers can even grow grapes that are **seedless**, because people like not having to spit out the seeds!

Vocabulary

seedless
without seeds

A. Write the traits that each kind of grape might need to make jelly or raisins. Choose from the box below.

seedless **easy to dry** **lots of sugar** **strong skin**

Grapes for jelly:	Grapes for raisins:
_____	_____
_____	_____

B. Pretend you are a farmer growing a new fruit crop. What traits would you want your fruit to have? Name the fruit and describe its traits. Then draw a picture of your fruit.

Fruit: _____

Traits I would choose: _____

_____

_____

_____

Name _____

Daily Science
Big Idea 2
WEEK 4

Day 5

Weekly Question

Why don't all grapes have seeds?

A. Complete each sentence. Circle your answer.

1. One common crop we use is _____.

books corn chickens

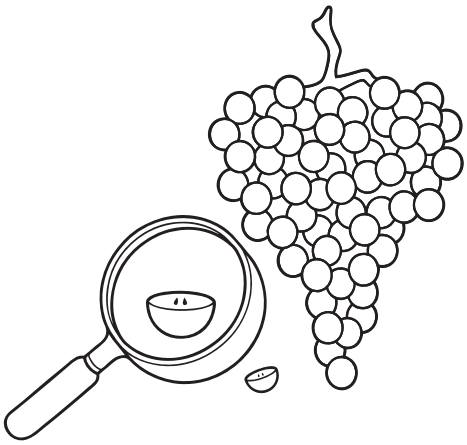
2. Only _____ grapes can be seedless.

sweet wild farmed

3. Being sour or sweet is an example of a _____.

trait farm crop

B. Look at the pictures of grapes below. Write two traits each grape has.



_____ _____

_____ _____

Name _____

Daily Science
Big Idea 2
WEEK 5

Unit Review

Comprehension

Plants and Animals

Read each question. Fill in the bubble next to the correct answer.

1. What is true about a fox and a wolf?
- Ⓐ They are alike in every way.
- Ⓑ They have different traits.
- Ⓒ They play together.

2. Why can't oranges grow on an apple tree?
- Ⓐ Apples and oranges are different species.
- Ⓑ There are too many varieties of oranges.
- Ⓒ Oranges are too sweet.

3. Why don't kittens look exactly like their parents?
- Ⓐ because kittens want to look different from other cats
- Ⓑ because offspring never resemble their parents
- Ⓒ because kittens get a mix of traits from each parent

4. Where do offspring get their traits?
- Ⓐ only from their mother
- Ⓑ mostly from their father
- Ⓒ from both parents

5. A farmer wants to grow grapes that people will buy for eating. Which trait might he choose for his crop?
- Ⓐ grapes that are dry
- Ⓑ grapes that are seedless
- Ⓒ grapes that taste sour

Name _____

Unit Review

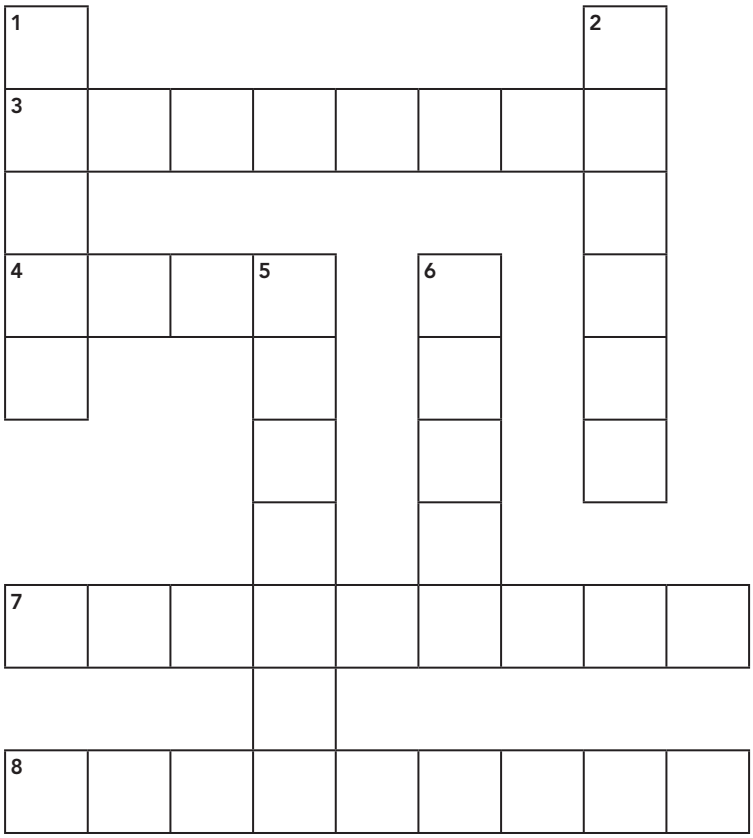
Vocabulary

Crossword Puzzle

Daily Science Big Idea 2

WEEK 5

Use the words in the box and the clues below to solve the puzzle.



crops

trait

varieties

resemble

species

offspring

behave

pups

DOWN

1. plants that are farmed

2. to act a certain way

5. All citrus fruits are the same _____.

6. Fur color is an example of a _____.

ACROSS

3. Kits _____ grown-up foxes.

4. baby wolves

7. Apples come in different _____.

8. young animals or plants

Name _____

Daily Science
Big Idea 2
WEEK 5

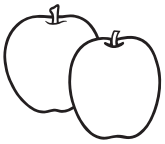
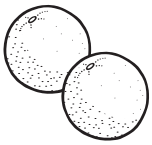
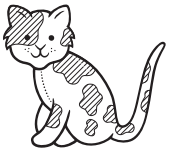
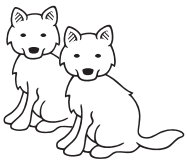
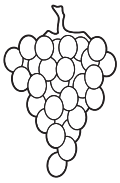
Unit Review

Visual Literacy

Parents and Offspring

Draw a line to match each parent with its offspring. Use the words in the box to write the name of the offspring.

kitten apples grapes pups oranges kit

Parent			Offspring
cat	•	• 	_____
apple tree	•	• 	_____
wolf	•	• 	_____
orange tree	•	• 	_____
fox	•	• 	_____
grapevine	•	• 	_____

Name _____

Daily Science
Big Idea 2
WEEK 5

Unit Review

Hands-on Activity

Invent a Pet

You know that two different species can't make offspring together. But what if they could? Imagine that you could invent a new pet. What animals would you choose for its parents? What would your new pet look like?

What You Need

- a 6-sided die

My Pet's Name:

1. Pick two animals to be the "parents" of your new pet. Write 3 traits for each animal.
2. Roll the die. Match the number on the die to the chart for animal A. Circle that trait. Roll again and circle another trait. Repeat the process for animal B.
3. The traits you circled are the traits for your new pet. Copy them into the bottom chart and then draw a picture of your new pet in the box. Don't forget to name it!

Animal A's Traits	Animal B's Traits
1. _____ 	1. _____ 
2. _____ 	2. _____ 
3. _____ 	3. _____ 

My New Pet's Traits

_____ _____

_____ _____

Earth contains rock, water, and air. People use all of these things.

Key Concepts
Earth, Sky, and Water

National Standard
Earth materials are solid rocks and soils, water, and gases of the atmosphere. Earth materials provide many of the resources that humans use.

Most second-grade students are already familiar with what Earth is made of (air, water, and rock). However, they are curious about where these natural resources come from and how much of them are on Earth. This Big Idea teaches students that:

- Earth materials include air;
- Earth materials include water;
- Earth materials include rocks; and
- Earth materials provide many resources that humans use.

Teacher Background

Earth is made of air, water, and rock. Earth's air is held in the atmosphere by gravity in a layer between the surface of Earth and outer space. Air consists mainly of nitrogen, oxygen, and a few other gaseous elements. In a layer that reaches up about six miles, the mixture of gases is dense and can support life.

All of the water that is currently on Earth is all of the water that has ever been on Earth. This water is used over and over again in a continuous cycle. It evaporates from oceans, rivers, and lakes; rises into the air; collects into clouds; rains on the land; and then flows back into the ocean.

Not all of Earth's landforms are immediately recognizable as rocks. This is because weathering breaks down rocks to form loose material. Sand is rock that has been weathered into very small grains. It is typically formed by processes of physical weathering, which include moving water and wind, as well as by temperature changes.

Together, air, water, and rocks provide natural resources that people use. Although abundant, these resources are finite. Recycling is a way of conserving Earth's materials.

For specific background information on each week's concepts, refer to the notes on pp. 68, 74, 80, and 86.

Unit Overview

WEEK 1: How far up does the sky reach?

Connection to the Big Idea: Students learn about the air in the atmosphere and how gravity keeps the air close to Earth.

Students begin by learning what the atmosphere is and how it helps sustain life. They learn about gravity's role in keeping the atmosphere close to Earth and how air thins the farther it is from Earth's surface.

Content Vocabulary: *atmosphere, gas, gravity*

WEEK 2: How much water is there on Earth?

Connection to the Big Idea: Students learn about Earth's water supply.

Students first learn that most of Earth's surface is covered by water, but that only a small amount of it is fresh water. They then learn where salt water and fresh water can be found on Earth, and they study the water cycle. Finally, they learn how different plants and animals use water.

Content Vocabulary: *evaporate, glacier, ice caps, surface, water cycle*

WEEK 3: Why do beaches and deserts have sand?

Connection to the Big Idea: Students learn that wind and water affect all things on Earth through weathering.

Students first learn what sand and rocks are made of and then discover how wind and water break rocks into sand.

Content Vocabulary: *mineral, quartz, weathering*

WEEK 4: Why do people recycle?

Connection to the Big Idea: Students learn that Earth's materials provide many resources that people use, but that these resources are limited.

Students begin by learning what recycling is and what kinds of things can be recycled. They then learn two common reasons for recycling: to dispose of things that cannot decompose and to reuse the limited natural resources on Earth.

Content Vocabulary: *decompose, natural resources, recycle*

WEEK 5: Unit Review

You may choose to do these activities to review concepts of Earth materials.

p. 92: Comprehension Students answer multiple-choice and true-false questions about key concepts in the unit.

p. 93: Vocabulary Students answer either/or questions that use key vocabulary from the unit.

p. 94: Visual Literacy Students label a diagram of the water cycle.

p. 95: Hands-on Activity Students reproduce the effects of weathering. Instructions and materials needed for the activity are listed on the student page.

Week 1

How far up does the sky reach?

Earth contains rock, water, and air. People use all of these things.

When students talk about the sky, what they are really referring to is Earth's atmosphere. The air we breathe, our weather, and the things we use to move through the sky all exist within the layer of the atmosphere that ends six miles above the ground. Beyond that are additional layers that get thinner and thinner, and while there are no hard boundaries, most scientists agree that the layers extend about 63 miles above the planet's surface. Different gases make up Earth's atmosphere and are what we commonly call "air." The gases are held close to Earth's surface by gravity, forming a type of blanket around the planet. In addition to giving us air to breathe and our weather, the atmosphere keeps Earth from becoming too hot or too cold.

Day One

Vocabulary: *atmosphere, gas*

Activate prior knowledge by asking students to describe what they think "air" is. Distribute page 69 and introduce the vocabulary words before having volunteers read the introduction aloud. Point out the picture on the page, distribute crayons, and help students complete activity A. Have students complete activity B independently. Then review the answers as a group.

Day Two

Materials: globe

Distribute page 70 and have volunteers read the introduction aloud. Ask: **How would life on Earth be different without the atmosphere?** (the temperature would be uncomfortable, we couldn't breathe, there would be no rain, and so on) Direct students to complete activity A. Then review the answers as a group. Have students complete activity B independently.

Day Three

Vocabulary: *gravity*

Distribute page 71, introduce the vocabulary word, and discuss the concept of gravity with students. (Gravity is what holds us to the ground, why things fall when we drop them, and so on.) Have volunteers read the introduction aloud. Direct students to complete the first activity independently. Then review the answers together. For the oral activity, pair students or discuss the answer as a group. (The air is thinner; there is less oxygen to breathe.)

Day Four

Distribute page 72 and read the introduction aloud with students. Help students understand how far six miles is, using the distance to commonly known places in your area. Guide students through the picture on the page by pointing out different features, and then have students complete the activities independently. Review the answers as a group.

Day Five

Tell students they are going to review everything they have learned about air and the atmosphere. Have them complete page 73. Then go over the answers together.

Name _____

Daily Science
Big Idea 3
WEEK 1

Day 1

Weekly Question

How far up does the sky reach?

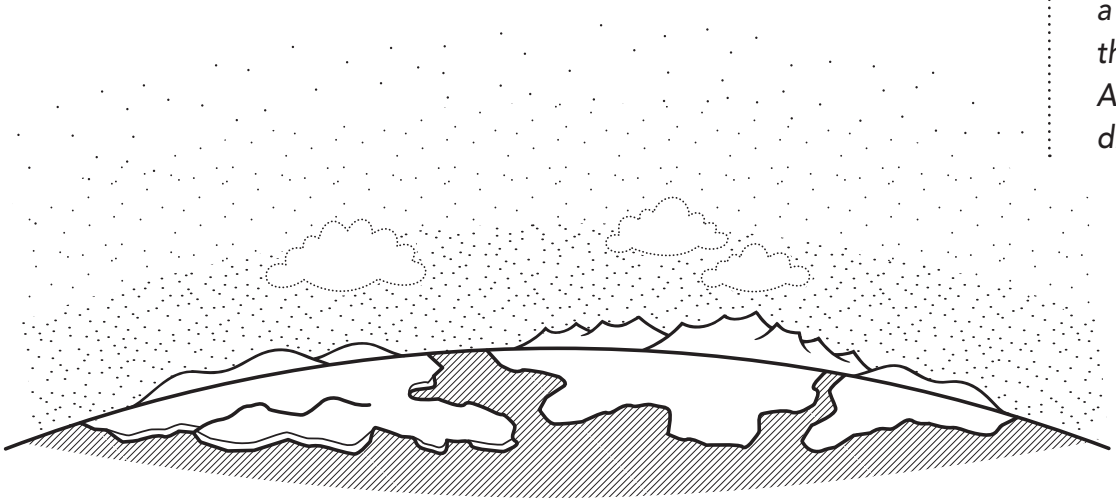
When you look at the sky, you are looking at a giant layer of air around Earth. This layer is called the **atmosphere**. The atmosphere is full of many kinds of **gas**. We breathe these gases. When they move, we feel them as wind. These gases cover Earth like a blanket.

Vocabulary

atmosphere
the layer of air around Earth

gas
a form of matter that expands. Air is made from different gases.

A. Look at the picture. Where is the atmosphere? Label it by writing **atmosphere** and drawing an arrow to the correct place. Then color the picture.



B. Complete each sentence. Circle the correct word.

1. The _____ is the layer of air around Earth.

atmosphere cloud wind

2. The air we breathe and the wind we feel are _____ in the atmosphere.

blankets gases skies

Name _____

Daily Science
Big Idea 3
WEEK 1

Day 2

Weekly Question

How far up does the sky reach?

Our atmosphere protects us and keeps us alive. It keeps Earth from getting too hot or too cold. All of Earth's weather happens in the atmosphere. Without the atmosphere, we wouldn't have rain, wind, or snow.

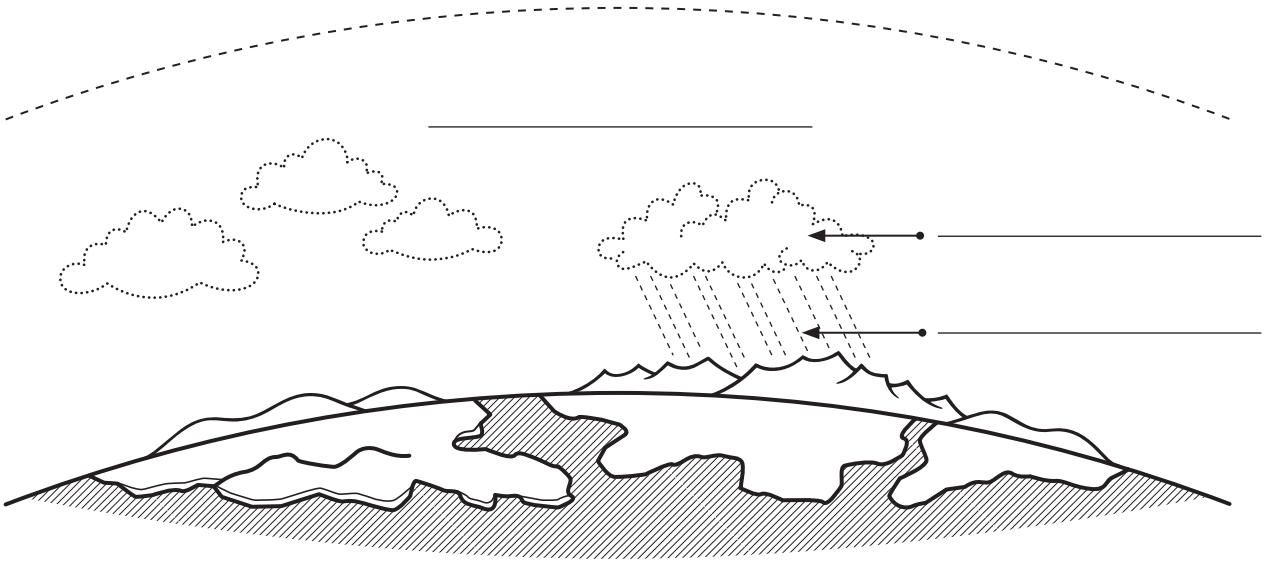
A. Name two ways the atmosphere helps us.

1. _____

2. _____

B. Look at this picture of the sky. Label the things in the picture. Use the words in the box.

atmosphere **clouds** **rain**



Name _____

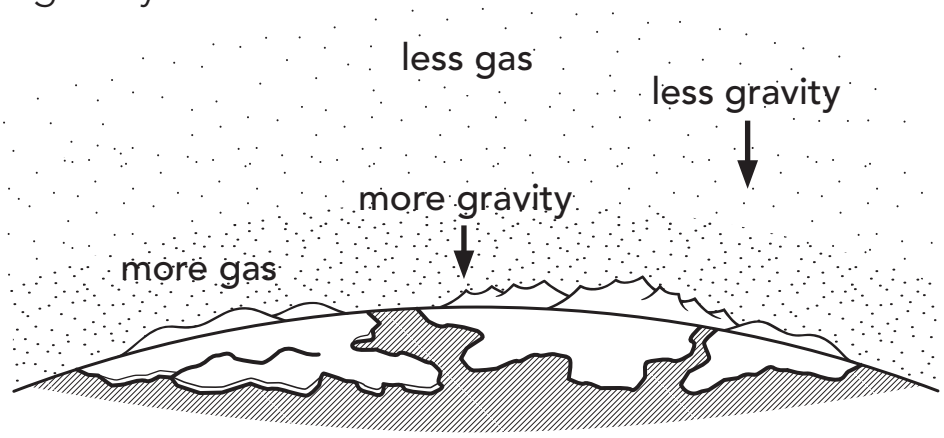
Daily Science
Big Idea 3
WEEK 1

Day 3

Weekly Question

How far up does the sky reach?

The atmosphere stays close to Earth because of **gravity**. Gravity pulls on everything. It pulls on the gases and keeps them close to Earth's surface. But gravity gets weaker the higher up you go. There is less gas at the top of the atmosphere because there is less gravity.



Vocabulary

gravity
a force that pulls all things closer to Earth

Read each sentence. Write **true** or **false**.

1. The atmosphere stays close to Earth because gases are heavy. _____
2. Gravity gets weaker the higher up you move. _____
3. When there is less gravity, there is less gas. _____

Talk

When people climb tall mountains, it becomes hard for them to breathe near the top. Why do you think this happens? Tell your partner.

Name _____

Daily Science
Big Idea 3
WEEK 1

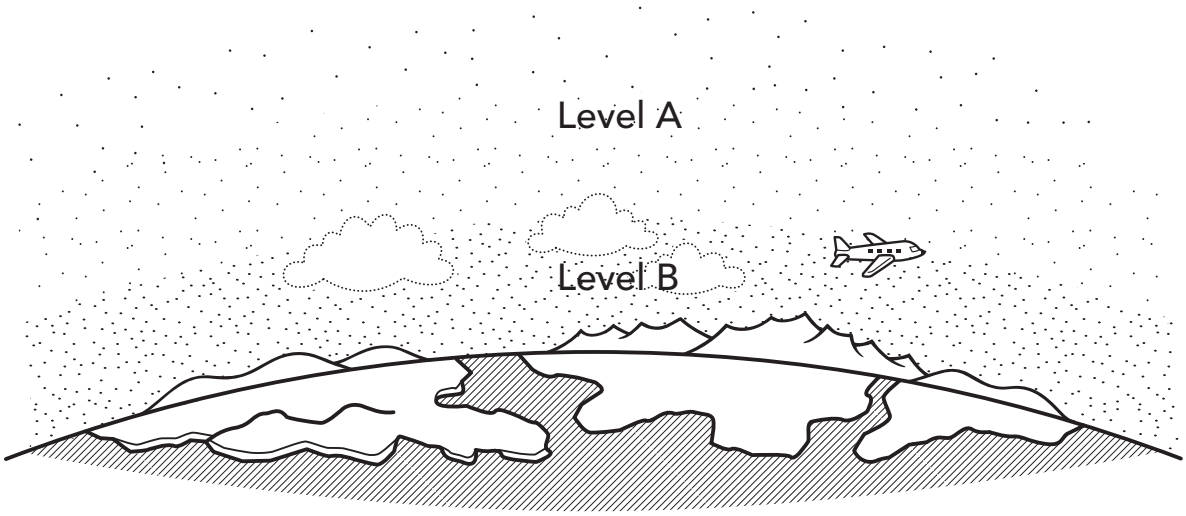
Day 4

Weekly Question

How far up does the sky reach?

Earth's atmosphere stretches more than 60 miles above the ground. But the thickest part, where the air is most dense, only goes up about 7 miles. All the weather on Earth happens in this bottom layer. What we think of as the "sky" ends at this point. Planes cannot fly above it. Beyond it, the atmosphere fades into outer space.

A. Look at the picture. Then answer the questions.



1. In which layer would you find rain, A or B? _____

2. Which layer goes up higher, A or B? _____

B. Read each question. Write **yes** or **no**.

1. Can a plane fly 10 miles above the ground? _____

2. Are there clouds in outer space? _____

Name _____

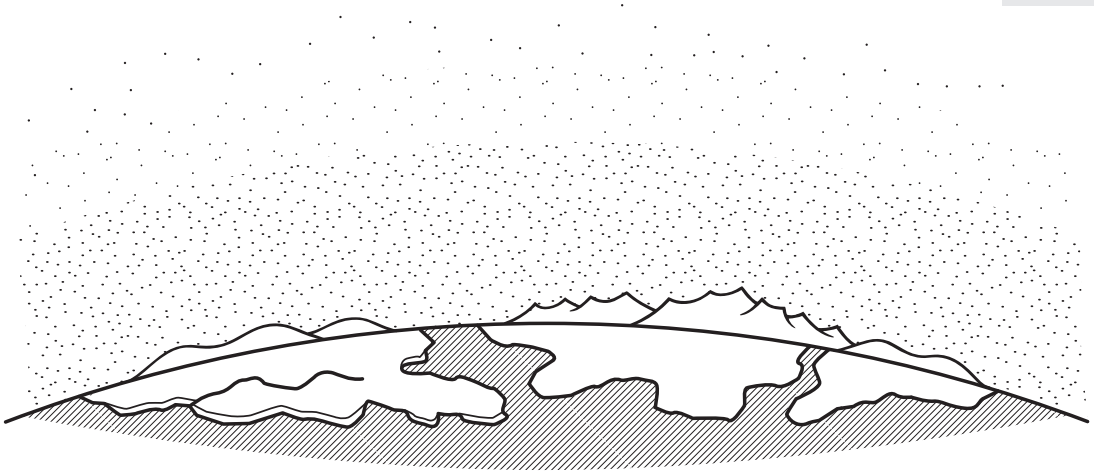
Daily Science
Big Idea 3
WEEK 1

Day 5

Weekly Question

How far up does the sky reach?

A. Look at the picture. Draw at least two things that could be in the bottom layer of Earth's atmosphere.



B. Complete each sentence. Use the words in the box.

gravity **atmosphere** **gases**

1. Earth's _____ gives us air and weather.
2. The atmosphere is full of _____ that we call "air."
3. Earth's _____ keeps the atmosphere close to the surface.

C. Describe two ways life would be different without the atmosphere.

1. _____
2. _____

Week 2

How much water is there on Earth?

Earth contains rock, water, and air. People use all of these things.

There are about 326 million trillion gallons of water on Earth! Students will learn, however, that most of it is undrinkable. The majority of Earth's water is salty ocean water that covers three-quarters of the planet's surface. Less than one percent of the planet's total water supply is in lakes and rivers. Most of Earth's fresh water is frozen in polar ice caps and glaciers. Some is present underground in aquifers and wells; the rest is floating in the air as clouds or water vapor or is locked up in the bodies of plants and animals. All the water that will ever be on Earth is here right now, and it is constantly moving through the water cycle.

Day One

Vocabulary: *glacier, ice caps, surface*

Materials: globe

Show students the globe and ask: **What does all the blue on the globe show?** (oceans) **Does it look like there is more water or more land on Earth?** (water) Distribute page 75 and introduce the vocabulary words. Point out the top and bottom of the globe, where Earth's ice caps can be found. Tell students that glaciers are also found near the poles, as well as in some mountain ranges. Then have volunteers read the introduction aloud. Guide students through the chart in activity A. For activity B, distribute crayons and have students complete the activity.

Day Two

Vocabulary: *evaporate, water cycle*

Distribute page 76 and introduce the vocabulary before having several students read the introduction aloud. Guide students through the water cycle by using the picture on the page. Then have students complete the activity. Go over the answers together.

Day Three

Distribute page 77 and have volunteers read the introduction aloud. Then distribute crayons and have students complete the activities independently. Review the answers together.

Day Four

Write the following number on the board: 326,000,000,000,000,000,000 gallons. Say: **This is how much water is on Earth!** Distribute page 78 and have volunteers read the introduction aloud. Point out that even though there is a lot of water on Earth, only a tiny amount is available for drinking. Have students complete activity A independently. For activity B, brainstorm ideas as a group before students write their ideas. For example, discuss how much water taking a shower uses and what is and is not okay to pour down a sink.

Day Five

Tell students they will review everything they have learned about water. Have students complete page 79. Go over the answers together.

Name _____

Daily Science
Big Idea 3
WEEK 2

Day 1

Weekly Question

How much water is there on Earth?

Most of Earth's **surface** is covered by water. Water can be salty or fresh. The water in oceans is full of salt. Fresh water is found in lakes and rivers, under the ground, in the air, or frozen in **ice caps** and **glaciers**. The water we have now on Earth is all the water we will ever have.

A. Complete the chart to tell where each type of water can be found. Use the paragraph above to help you.

	Where it is
Fresh water	
Salt water	

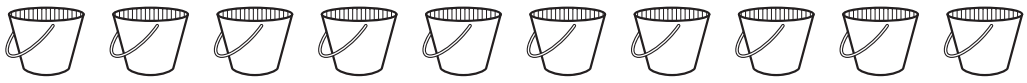
Vocabulary

glacier
a very large body of ice

ice caps
very large areas of ice at the North and South Poles

surface
the top layer of something

B. Imagine that the buckets below held all the water on Earth. Color 9 buckets blue for the salt water. Color 1 bucket green for the fresh water. Then write the numbers to complete the paragraph.



In this picture, _____ buckets have salt water, and _____ bucket has fresh water. There are _____ more buckets of salt water than fresh water.

Name _____

Daily Science
Big Idea 3
WEEK 2

Day 2

Weekly Question

How much water is there on Earth?

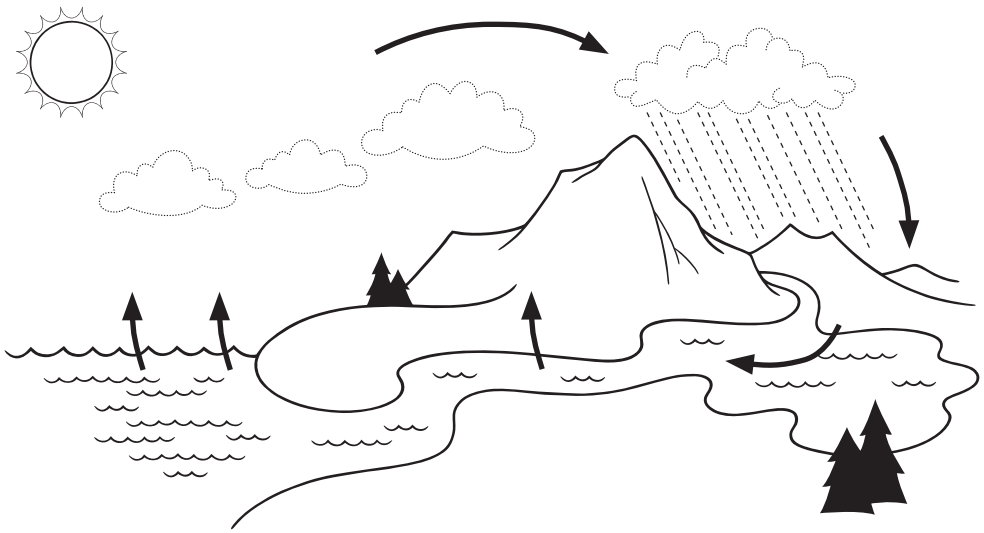
The water on Earth is always moving through the **water cycle**. A cycle is something that repeats over and over. Water starts in the ocean or on land. It then **evaporates**, or changes from a liquid to a gas. The gas forms clouds. Water changes from a gas to a liquid when it rains. It falls back to land or into the oceans.

Vocabulary

evaporate
to change from a liquid to a gas

water cycle
how the water moves around between places on Earth

Look at the diagram of the water cycle. Then read the sentences. Circle **true** or **false**.



1. Only a small amount of water goes through the water cycle. true false

2. When water evaporates, it changes from a liquid to a gas. true false

3. Rain returns only to the ocean. true false

4. Water in lakes and rivers can evaporate. true false

Name _____

Daily Science
Big Idea 3
WEEK 2

Day 3

Weekly Question

How much water is there on Earth?

Many things can happen to water as it falls from the clouds to Earth. In cold places, the water freezes. It makes snow or ice. It can become part of a glacier or an ice cap.

In warmer places, water falls as rain. Some of the rain flows into oceans, rivers, and lakes. Some of it soaks into the ground.

A. Read each question. Put a check next to the correct answer.

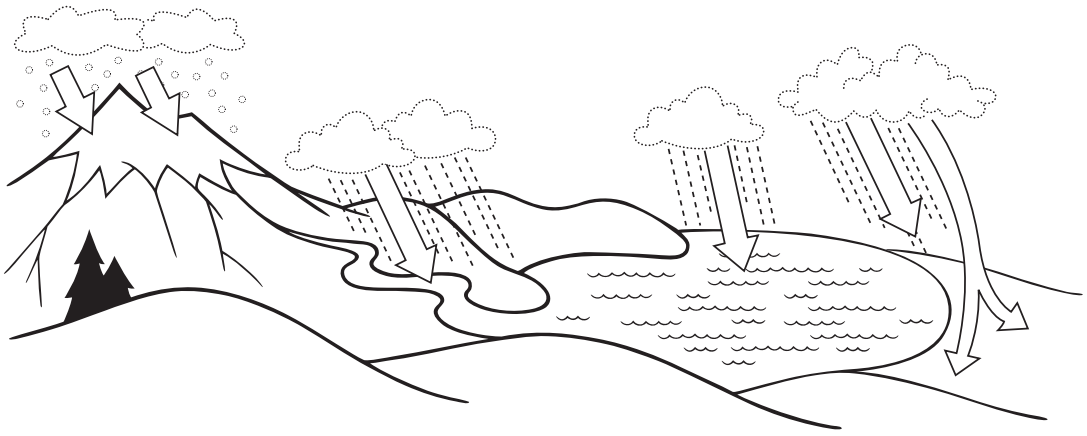
1. How do plants, animals, and people use water?

❒ They freeze it. ❒ They drink it.

2. What happens to water that falls as rain?

❒ It goes into rivers. ❒ It goes into glaciers.

B. Use blue to color the arrows that show where snow goes. Use red to color the arrows that show where rain goes.



Name _____

Daily Science
Big Idea 3
WEEK 2

Weekly Question

Day 4 How much water is there on Earth?

Plants, animals, and people need fresh water. But most of the water on Earth is too salty to drink. Most of the fresh water is frozen in ice caps and glaciers, so we can't drink that, either. That is why it is very important not to waste the little water we can drink. We must keep it clean, too.

A. Read each sentence. Circle **yes** or **no**.

1. All of Earth's water is fresh. yes no
2. Most of the fresh water is frozen. yes no
3. Plants need fresh water, but people can drink fresh and salty water. yes no

B. Write about one way you can help save water or keep water clean. Draw a picture to go with your writing.

_____

_____

_____

_____

Name _____

Daily Science
Big Idea 3
WEEK 2

Day 5

Weekly Question

How much water is there on Earth?

A. Complete the paragraph. Use the words in the box.

glaciers **oceans** **surface** **evaporating**

Most of Earth's _____ is covered by water. Most of the salt water is in _____. Most of the fresh water is frozen in large ice caps and _____. Water is always _____ and moving through the water cycle.

B. Put the steps of the water cycle in order. The first one is shown for you. Write **2**, **3**, or **4** next to the other steps.

1 Rain clouds form over land and the oceans.

___ Water evaporates from oceans, lakes, or rivers.

___ Rain falls into the ocean or onto the land.

___ Rain that falls on land freezes, goes under the ground, flows into lakes or rivers, or is used by plants and animals.

Earth contains rock, water, and air. People use all of these things.

Week 3

Why do beaches and deserts have sand?

In this week's lesson, students will learn that sand is found on beaches and in deserts because of the physical forces of moving water and wind. The constant motion of waves and wind slowly breaks down rocks into smaller pieces. This is known as weathering. The rocks and smaller pieces become rounder and smoother over time. Erosion carries the particles away from their rock source and deposits them on beaches or in desert dunes in the familiar form of sand. Since quartz is the most common mineral found in rocks, most of the world's sand is composed of quartz mineral fragments.

Day One

Vocabulary: *mineral, quartz*

Materials: sand (optional)

Distribute page 81 and introduce the vocabulary. Then have volunteers read the introduction aloud. Have students complete activity A together. For activity B, if you have brought in sand, allow students to touch and examine it. Brainstorm with students the different properties of sand and list the words on the board. Then have students complete the activity and share their sentences.

Day Two

Vocabulary: *weathering*

Distribute page 82 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Point out the pictures on the page that show how weathering happens and elicit descriptions of the pictures from students. Then have students complete the first activity. For the oral activity, pair students or discuss the answer as a group.

Day Three

Materials: picture of a sandy desert (optional)

Distribute page 83 and have volunteers read the introduction aloud. If you brought in a picture of a desert, show it to students and point out the sand and any other evidence of wind or weathering. Then have students complete the activities independently. Review the answers together.

Day Four

Distribute page 84 and have volunteers read the introduction aloud. Point out the pictures on the page and have students describe them. Then allow students to complete the activity independently.

Day Five

Tell students they will review everything they have learned about weathering. Have students complete page 85. Then review the answers together.

Name _____

Daily Science
Big Idea 3
WEEK 3

Day 1

Weekly Question

Why do beaches and deserts have sand?

Earth is full of rocks. Rocks are made of **minerals**. Minerals are kinds of solids found on Earth. The most common kind of mineral in rocks is called **quartz**. Quartz is a hard crystal that looks like glass. Most of the sand on beaches and in the desert is made from quartz.

Vocabulary

mineral
a natural, solid, nonliving thing

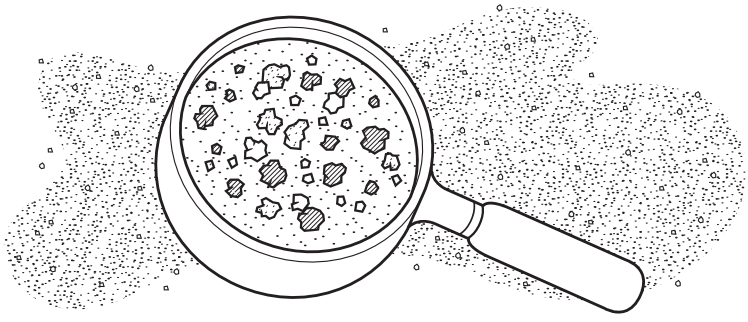
quartz
a hard, clear mineral that is the most common mineral on Earth

A. Complete each sentence. Use the words in the paragraph.

1. A common mineral that looks like glass is called _____.

2. All nonliving solids found on Earth are made of _____.

B. Look at the close-up picture of the sand. What can you say about it? Write two sentences that describe it.



_____

_____

Name _____

Daily Science
Big Idea 3
WEEK 3

Day 2

Weekly Question

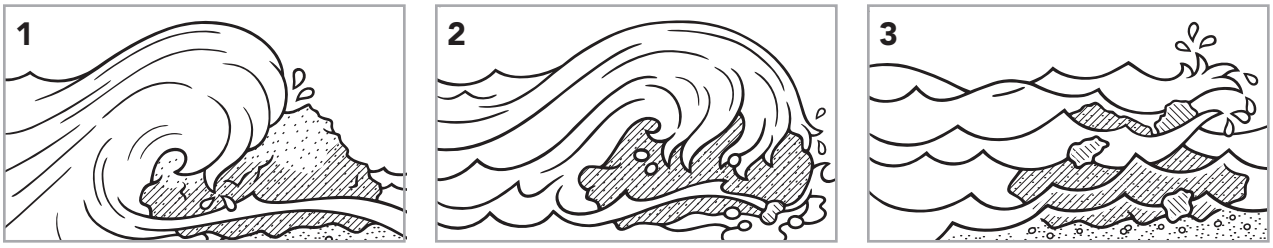
Why do beaches and deserts have sand?

Most rocks are very hard, but they can be changed. Water can change the shape and size of rocks. This is called **weathering**. Waves of water crash against the rocks on ocean shores. Bit by bit, the minerals in rocks break apart. It takes many years for the rocks to get smaller. Over time, they become smooth and rounded. Then they become sand.

Vocabulary

weathering
the process of breaking something down with wind or water

Look at the pictures showing weathering. Then read the sentences. Write the number of each picture next to the sentence that describes it.



___ The rock is weathered by the ocean and breaks into even smaller pieces.

___ The wave crashes against the rock.

___ Water runs down the rock and breaks off some of the minerals.

Talk

Do you think weathering happens faster with strong waves or weak waves? Why? Tell your partner.

Name _____

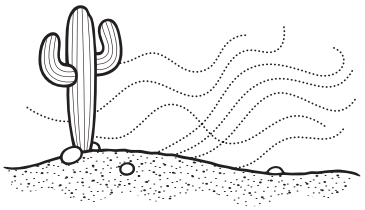
Daily Science
Big Idea 3
WEEK 3

Day 3

Weekly Question

Why do beaches and deserts have sand?

Wind is another thing that causes weathering. Desert winds blow against the rocks in mountains. Wind carries small rocks. The small rocks hit larger rocks, which break down over time. The rocks get smaller and smoother. After a long time, the big rocks become tiny grains of sand. They are carried by the wind into the desert.

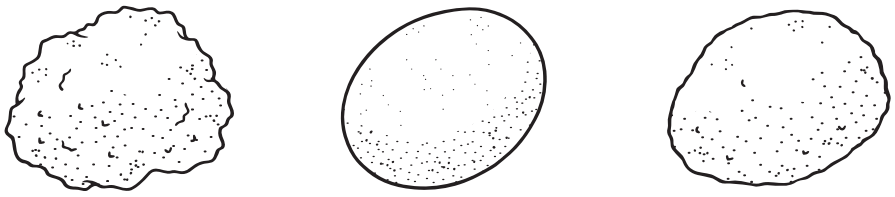


A. Read each question. Circle the answer.

1. Which of these does NOT break up rocks?

   clouds water wind

2. Which rock shows the most weathering?



B. Read each sentence. Write **yes** or **no**.

1. Large rocks blow against small rocks to make sand. _____
2. Wind can cause weathering. _____
3. Wind can blow sand into the desert. _____

Name _____

Daily Science
Big Idea 3
WEEK 3

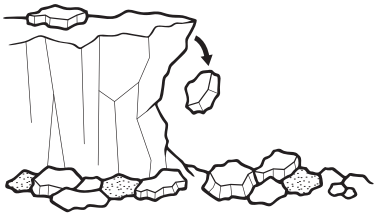
Day 4

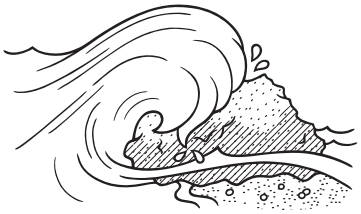
Weekly Question

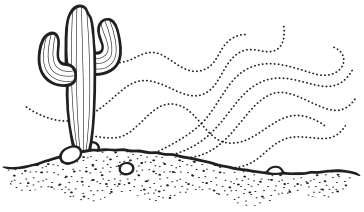
Why do beaches and deserts have sand?

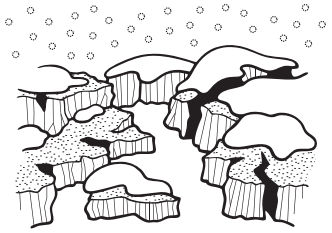
Water and wind aren't the only things that cause weathering. Gravity causes weathering by pulling down on rocks. When they fall, they break. Ice causes weathering, too. When water freezes, it gets bigger. It pushes against rocks and breaks them apart.

Draw a line from each picture to the word that tells what kind of weathering it shows. Then complete the sentence.









- wind
- ice
- gravity
- water

Wind, water, gravity, and ice can all cause _____.

Name _____

Daily Science
Big Idea 3
WEEK 3

Day 5

Weekly Question

Why do beaches and deserts have sand?

A. Read each sentence. Write **true** or **false**.

1. Water can make rocks bigger. _____
2. Wind can make rocks smoother. _____
3. Most sand is full of quartz. _____

B. Complete the paragraph. Use the words in the box.

minerals **water** **weathering** **winds**

The sand in deserts and on beaches comes from a process called _____. One cause for weathering is desert _____ that blow against rocks. Waves of _____ also cause weathering on ocean shores. Bit by bit, the _____ in rocks break apart.

C. Which of these can cause weathering? Circle the answer.

wind water gravity all of these

Earth contains rock, water, and air. People use all of these things.

Week 4

Why do people recycle?

In this week's lesson, students learn that people recycle for many reasons. One is that Earth's abundant natural resources are limited. Researchers calculate that more than 47,000 pounds of new minerals—including sand, cement, iron, aluminum, and other metals—are consumed for every person in the United States each year. Nature does not grow or create new aluminum ore or other minerals, so either these minerals must be constantly mined and imported, or products must be made from recycled products. Some products, such as paper, come from renewable resources. But paper does not decompose quickly in landfills. By recycling, we can reuse the resources that are finite, and we can reduce the amount of land needed to store garbage.

Day One

Vocabulary: *recycle*

Materials: objects with the recycling logo on them (optional)

Distribute page 87 and point out the recycling symbol on the page. Ask where students have seen this symbol before. If you have objects with the symbol on them, show them to students. Then introduce the vocabulary word and invite volunteers to read the introduction before students complete activity A. Review the answers together and have students explain their thinking. Repeat the process for activities B and C. For the oral activity, you may want to point out that *recycle* contains the word *cycle*. Review that a *cycle* is something that repeats over and over, and elicit that when we recycle, we are using the same thing many times.

Day Two

Distribute page 88 and have volunteers read the introduction aloud. Have students complete the first two activities. For the oral activity, pair students or complete it as a group. Consider brainstorming items that are easy to reuse and those that are easy to recycle and listing them in a T-chart on the board.

Day Three

Vocabulary: *decompose*

Distribute page 89 and introduce the vocabulary word. Ask: **Have you ever seen a piece of rotten fruit or vegetable? What did it look and smell like?** Have volunteers read the introduction aloud. Then have students complete the activities. Review the answers together.

Day Four

Vocabulary: *natural resources*

Distribute page 90 and introduce the vocabulary word before reading the introduction aloud as a group. Have students complete activity A and invite a volunteer to read the completed sentence aloud. Then help students understand the chart for activity B. Have them complete the activity, and have volunteers read the completed sentences aloud.

Day Five

Tell students they will review everything they have learned about why people recycle. Have students complete page 91. Then go over the answers together.

Name _____

Daily Science

Big Idea 3

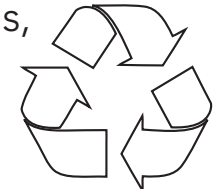
WEEK 4

Day 1

Weekly Question

Why do people recycle?

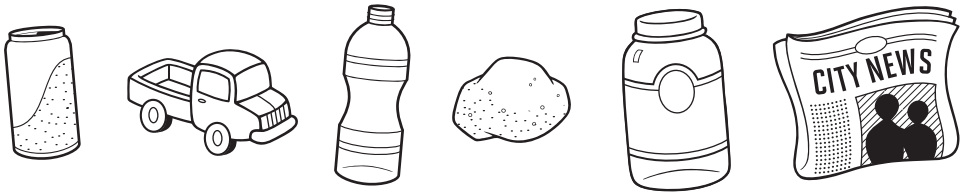
Have you ever seen the symbol on the right? Sometimes it is on trash cans. Sometimes it is on the bottoms of the things we use, such as cans, bottles, and other containers. The symbol means **recycle**, or reuse old things to make new ones.



Vocabulary

recycle
to use old products to make new ones

A. Guess which pictures show things that you can recycle. Circle them.



B. Read each sentence. Write **yes** or **no**.

1. We can use old newspaper to make more paper. _____

2. Everything we throw out gets recycled. _____

C. Complete the sentence.

Something I can recycle is _____.

Talk

Why do you think the recycling symbol shows three arrows making a circle? How does this symbol explain what recycling is? Tell your partner.

Name _____

Daily Science
Big Idea 3
WEEK 4

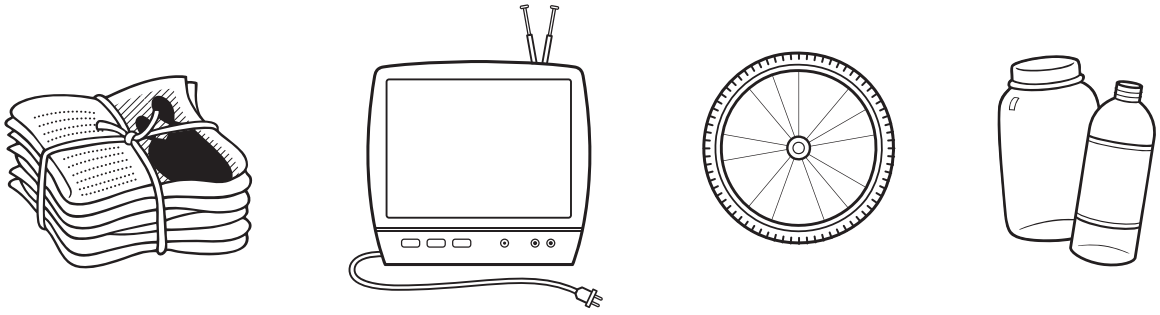
Day 2

Weekly Question

Why do people recycle?

Some things, such as bottles and cans, are easy to recycle. Other things, such as old computers, batteries, tires, and cellphones, are not as easy. But they don't always have to be thrown out. Instead, people try to use them again in different ways. Parts from old computers can sometimes be used in new computers. Tires can be shredded and used in doormats and even floors!

A. Circle the two things that are the easiest to recycle.



B. Circle the word that completes each sentence.

1. A _____ can be used to make a mat. **bottle** **tire**
2. A computer has parts that can be _____. **reused** **recycled**
3. It is easy to recycle a _____. **can** **car**

Talk

Think of some other things that might be reused instead of being thrown away. Tell your partner.

Name _____

Daily Science

Big Idea 3

WEEK 4

Day 3

Weekly Question

Why do people recycle?

Nature is a "recycler" in some ways. When plants and animals die, they **decompose**, or rot. They become part of the soil and get reused. But other things, such as metals, plastic, and glass, do not decompose. They stay in our garbage dumps. Even though nature can't recycle these things, we can. Recycling keeps those pieces of trash off the ground and out of the oceans.

Vocabulary

decompose
to decay or rot

A. Circle the things that will decompose.

soda can	apple	flower
tire	worm	plastic bag

B. Write a word from above to complete each sentence.

1. A _____ will decompose.
2. A _____ will NOT decompose.

C. Write the word that answers each question.

1. What stays in a landfill, **plants** or **plastic**? _____
2. What decomposes, **lettuce** or a **light bulb**? _____
3. What recycles, **nature**, **people**, or **both**? _____

Name _____

Daily Science
Big Idea 3
WEEK 4

Day 4

Weekly Question

Why do people recycle?

Earth's **natural resources** are limited. That means they can't be replaced. Natural resources include air, water, minerals, plants, and animals. Everything that people make comes from natural resources. But some resources, like minerals, can't be replaced. We need minerals to make glass bottles and metal cans. Because Earth does not make new minerals, we won't always be able to make new things. But we can recycle old ones!

Vocabulary

natural resources
the things in nature that people use

A. Complete the sentence.

Minerals are _____ resources that cannot be replaced.

B. Look at the chart. Use it to complete each sentence.

Things we use	What they are made from
glass bottles	sand
aluminum cans	metal
plastic bags	oil

1. Sand is used to make _____ bottles.
2. An aluminum can is made from _____.
3. _____ is used to make plastic bags.

Name _____

Daily Science

Big Idea 3

WEEK 4

Day 5

Weekly Question

Why do people recycle?

A. Read each sentence. Circle **true** or **false**.

1. When garbage decomposes, it rots and breaks down. true false
2. Earth's natural resources are limited. true false
3. Tires and computers can be easily recycled. true false
4. Glass and metal are made from minerals. true false

B. Look at the chart. Put a check in the correct box to tell about each thing.

	Easily recycled	Not easily recycled
Television		
Aluminum can		
Newspaper		

C. Complete the sentences. Use the words in the box.

decompose **recycle**

1. When you _____, you reuse something.
2. Bottles can't _____, but plants can.

Name _____

Daily Science
Big Idea 3
WEEK 5

Unit Review

Comprehension

Earth, Sky, and Water

A. Read each question. Fill in the bubble next to the correct answer.

1. Where would you be if you went above the atmosphere?
   - Ⓐ in the ocean
   - Ⓑ in outer space
   - Ⓒ in an airplane

2. Where is most of Earth's water?
   - Ⓐ in oceans and glaciers
   - Ⓑ under the ground
   - Ⓒ in clouds

3. Weathering changes rocks into _____.
   - Ⓐ ice and water
   - Ⓑ sandy deserts and beaches
   - Ⓒ gravity and wind

4. People recycle because _____.
   - Ⓐ Earth is making new minerals
   - Ⓑ all garbage decomposes and breaks down
   - Ⓒ natural resources are limited

B. Read each sentence. Circle **true** or **false**.

1. The water cycle makes more water for Earth. **true** **false**

2. Quartz is a mineral that is found in sand. **true** **false**

Name _____

Unit Review

Vocabulary

Either/Or Questions

Daily Science Big Idea 3 WEEK 5

Write the answer to each question.

1. Would it be hot or cold on a **glacier**? _____
2. Are **minerals** living or nonliving? _____
3. Which one would **decompose**, a glass bottle or a dead plant? _____
4. Which one would **evaporate**, a puddle or a rock? _____
5. Do people use **natural resources** to make cars or to make water? _____
6. What causes **weathering**, wind and water or bottles and plants? _____
7. Is the **atmosphere** made of air or mountains? _____
8. Does **gravity** push or pull things on Earth? _____
9. What covers most of Earth's **surface**, water or plants? _____

Name _____

Daily Science
Big Idea 3
WEEK 5

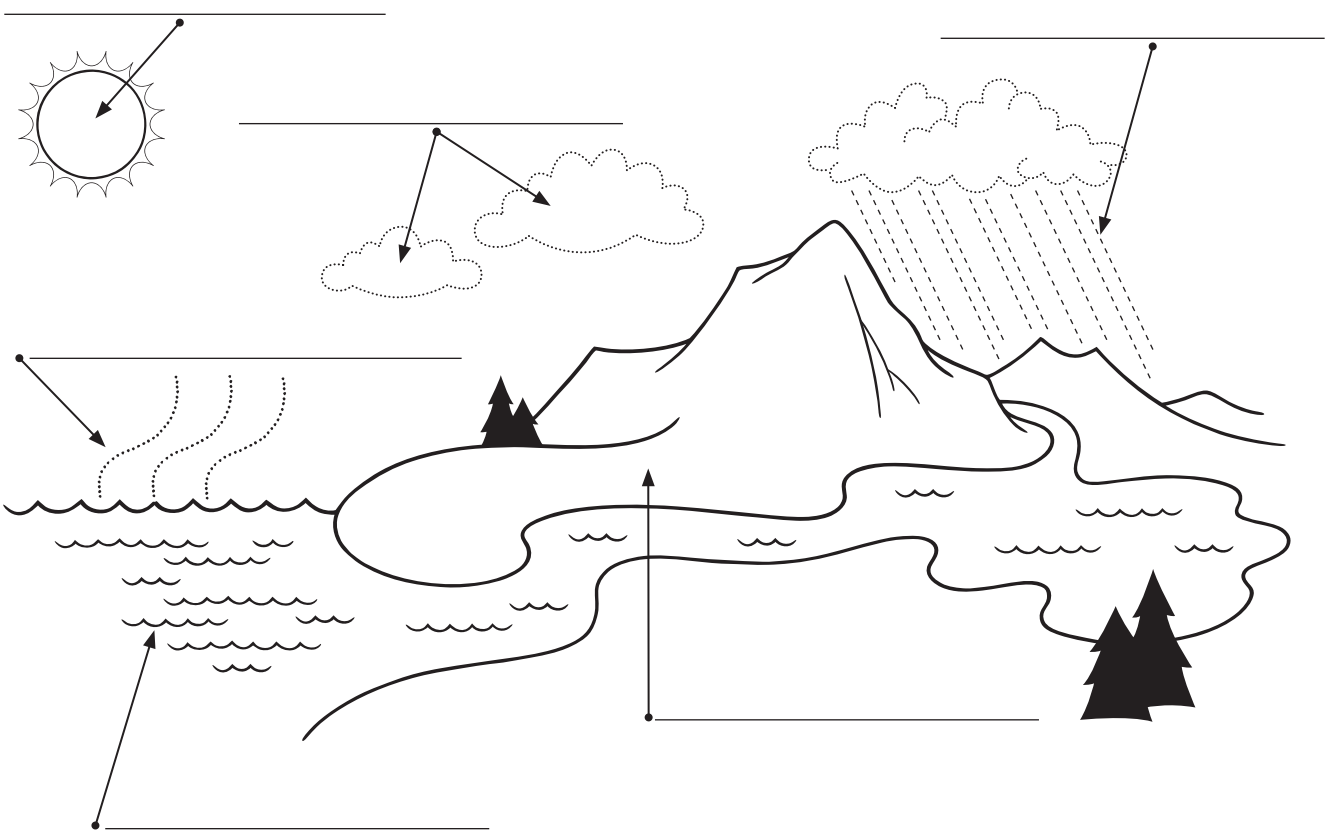
Unit Review

Visual Literacy

The Water Cycle

This diagram shows how the water cycle happens over and over. Label the diagram. Use the words in the box.

land	sun	clouds
ocean	rain	evaporation



Name _____

Daily Science
Big Idea 3
WEEK 5

Unit Review

Hands-on Activity

Weathering Rocks

Rocks in a stream or lake become weathered when they are tumbled by the water. Here's how you can "weather" rocks yourself!

What You Need

- ½ cup gravel
- 2 small jars with tight lids
- 2 coffee filters
- a strainer
- a bowl
- water

1. Place half the gravel in each jar, and fill the jars with water.
2. Shake one jar as many times as you can in 2 minutes. Do not shake the other jar.
3. Place a coffee filter inside the strainer. Hold it over the bowl. Pour everything from the jar you shook into the filter. Let the water drain.
4. Take the rocks out of the filter, but leave the sand. Then lay the sandy filter flat to dry.
5. Repeat steps 3 and 4 with the unshaken jar.

What Did You Discover?

1. What did the coffee filters catch?

_____

2. What effect did shaking the jar have?

_____

3. Why did one filter have more sand?

_____

The sun, moon, and stars all have predictable patterns of movement.

Key Concepts
Sun, Moon, and Stars

National Standard
The sun, moon, and stars all have properties, locations, and movements that can be observed and described. Objects in the sky have patterns of movement.

By second grade, students are generally aware that the sun is not visible in the sky all the time, and that the moon changes shape. Some students also may have observed that the stars change positions in the sky at night. However, most students have difficulty understanding what causes the apparent movements of the sun, moon, and stars. This Big Idea teaches students that:

- the sun appears to set at night because Earth rotates;
- stars appear to change positions in the sky because Earth rotates;
- the moon does not have the characteristics to be a planet; and
- the sun shines on different parts of the moon as the moon moves around Earth.

Teacher Background

The sun is the center of our solar system. Earth is one of the planets constantly in motion around the sun. Earth orbits the sun every 365.26 days. In addition, Earth makes one complete rotation on its axis every 24 hours. This rotation causes stationary objects in space, such as the sun and stars, to appear to move across the sky in a predictable way. Earth's rotation is also the reason we have daytime and nighttime.

The moon is the most observable object in the nighttime sky and, like the planets in our solar system, it is constantly in motion. Unlike planets, though, the moon does not orbit the sun by itself. It orbits Earth while Earth orbits the sun. Half of the moon is always illuminated by the sun. The moon appears to change shape because we see different sunlit parts of the moon during its orbit around Earth.

For specific background information on each week's concepts, refer to the notes on pp. 98, 104, 110, and 116.

Unit Overview

WEEK 1: What happens to the sun at night?

Connection to the Big Idea: Students learn that the sun appears to set at night because Earth rotates.

Students begin by learning about Earth's rotation and how it results in "daytime" and "nighttime." Students learn that the rotation is what makes the sun look like it is moving across the sky from east to west and that the sun's brightness prevents us from seeing stars in the daytime. Finally, students consider what might happen to the weather if Earth did not rotate.

Content Vocabulary: *daytime, nighttime, rotate*

WEEK 2: Why aren't stars always in the same part of the sky at night?

Connection to the Big Idea: Students learn that stars appear to change positions because Earth rotates.

Students begin by learning the general attributes of stars (color and size) and that some stars form constellations that can be seen at different times of the year as Earth orbits the sun. Students also learn that, like the sun, stars seem to move across the sky because Earth moves, but that it is harder to notice because they are so far away and there are so many.

Content Vocabulary: *constellation, stars*

WEEK 3: Is the moon a planet?

Connection to the Big Idea: Students learn that the moon is *not* a planet because it orbits Earth rather than the sun.

Students begin by comparing the moon with Earth, learning that both are made from rock, but that the moon is much smaller. Students then learn about Earth's orbit around the sun and the moon's orbit around Earth. Finally, they discover that other planets have moons, too.

Content Vocabulary: *moon, orbit, planet, solar system*

WEEK 4: Why does the moon change shape?

Connection to the Big Idea: Students learn that the phases of the moon are caused by the moon orbiting Earth.

Students begin by learning that the moon reflects light from the sun. They then learn about phases of the moon, discovering that the changing shapes result from our seeing the moon at different angles during its orbit.

Content Vocabulary: *eclipse, phase, reflect*

WEEK 5: Unit Review

You may choose to do these activities to review concepts of the sun, moon, and stars.

p. 122: Comprehension Students answer multiple-choice and true-false questions about key concepts from the unit.

p. 123: Vocabulary Students complete a crossword puzzle using key vocabulary.

p. 124: Visual Literacy Students match sentences to pictures of the moon.

p. 125: Hands-on Activity Students track the sun's movement in the sky by measuring changes in their shadow throughout the day. Materials and instructions needed for the activity are listed on the student page.

Week 1

What happens to the sun at night?

The sun, moon, and stars all have predictable patterns of movement.

In this week's lesson, students learn that although we cannot feel its motion, Earth is constantly rotating on its axis. It takes Earth 24 hours to make one counterclockwise rotation. During this rotation, only one side of the planet faces the sun. This causes Earth to have daytime on one side while it is nighttime on the other. The sun's brightness causes the stars to "disappear" during the day and come out at night. The rotation also regulates Earth's temperature, allowing the planet to heat and cool evenly as it turns.

Day One

Vocabulary: *daytime, nighttime, rotate*

Materials: flashlight, globe, sticker

Distribute page 99 and introduce the vocabulary before having volunteers read the introduction aloud. Point out the illustration on the page and explain that as Earth rotates, different parts of Earth receive sunlight. Place the sticker on the globe to represent where your class is. Shine the flashlight on the sticker and slowly spin the globe. Say: **Earth's rotation is the reason we have night and day.** Brainstorm things students see in the sky during the day and at night. Then have students complete the activities.

Day Two

Review **north**, **south**, **east**, and **west** with students. If you have a window, help students figure out which direction the window faces. Tell students that when they see the sun rise, they are looking east, and when they see the sun set, they are looking west. Distribute page 100 and have volunteers read the introduction aloud. To reinforce the concept of why the sun appears to move across the sky, have students stand and spin slowly in place. Explain that if students didn't know they were spinning, they might think the things in the classroom were moving. Then have students complete the activities.

Day Three

Materials: flashlight, globe, sticker

Repeat the globe and flashlight demonstration from Day 1, but shine the flashlight on the globe anywhere east of the sticker. Say: **If we can see the sun to the east of us, what time of day is it?** (morning) Rotate the globe counterclockwise. Then ask students what they would now see in the sky. (stars) Distribute page 101 and have volunteers read aloud the introduction. Then have students complete the activities.

Day Four

Ask students to describe what they think Earth would be like if it was always daytime or nighttime. Distribute page 102 and have volunteers read the introduction aloud. Then have students complete the activities.

Day Five

Tell students they will review everything they have learned about the sun and Earth's rotation. Have students complete page 103. Then go over the answers together.

Name _____

Daily Science

Big Idea 4

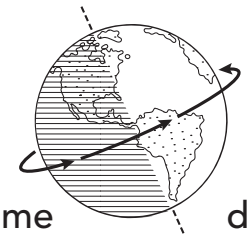
WEEK 1

Day 1

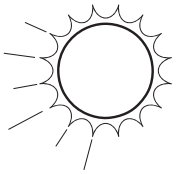
Weekly Question

What happens to the sun at night?

Earth is always **rotating**, or spinning around. It takes 24 hours for Earth to complete one turn. That's why a day is 24 hours long. The part of the day when we see the sun is called **daytime**. The part of the day when we don't see the sun is **nighttime**.



nighttime daytime



A. Name two things you see in the sky during daytime and two things you see during nighttime.

Daytime: _____ _____

Nighttime: _____ _____

B. Answer the questions.

1. How long does it take Earth to rotate once?

_____

2. What is something you do only during the daytime?

_____

3. What is something you do only during the nighttime?

_____

Vocabulary

daytime
the time of day when the sun is in the sky

nighttime
the time of day when the sun is not in the sky

rotate
to spin in a circle

Name _____

Daily Science
Big Idea 4
WEEK 1

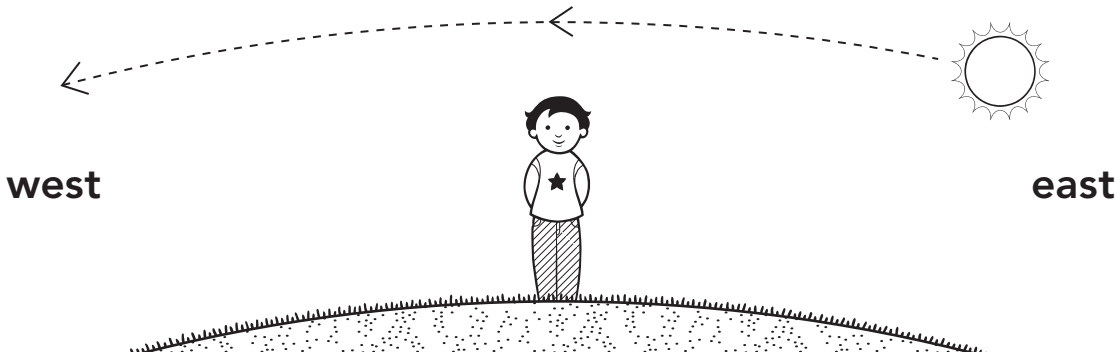
Day 2

Weekly Question

What happens to the sun at night?

During the day, Earth turns toward the sun. The sun looks like it is moving from east to west across the sky. But the sun is not moving. Earth is!

A. Trace the path of the sun across the sky.



B. Read each question. Write a complete sentence to answer it.

1. Where does the sun rise, in the **east** or the **west**?

_____

2. What object does our part of Earth face during the day?

_____

3. Why does the sun look like it is moving?

_____

Name _____

Daily Science
Big Idea 4
WEEK 1

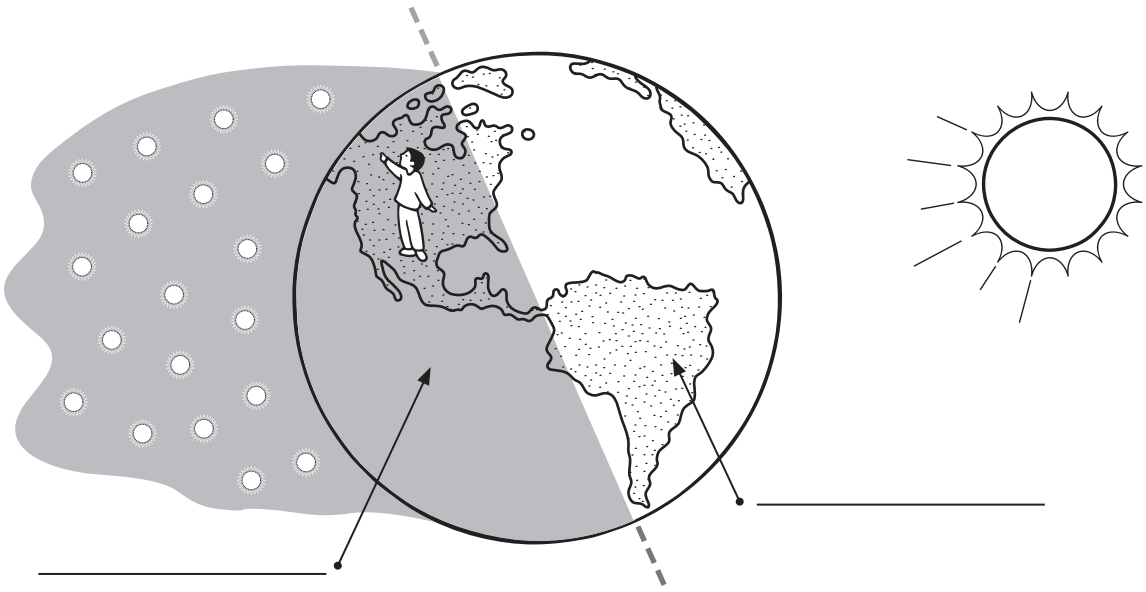
Day 3

Weekly Question

What happens to the sun at night?

At night, our part of Earth faces away from the sun. People on the other side of Earth see the sun. It is daytime for them. But for us, the sky is dark. We see the stars. The stars are there in the daytime, too, but the sun is too bright for us to see them.

A. Look at the picture. Write **day** where it is day on Earth. Write **night** where it is night. Circle the stars.



_____ _____

B. Read each sentence. Write **yes** or **no**.

1. The sun stops shining on Earth at night. _____
2. There are stars on only one side of Earth. _____
3. There is always someplace on Earth where it is nighttime. _____

Name _____

Daily Science
Big Idea 4
WEEK 1

Day 4

Weekly Question

What happens to the sun at night?

Earth never stops rotating. If Earth did stop, one side would stay in the sunlight all the time, and the other side would stay in the dark. The weather would be very weird! It would be too hot on the sunny side and too cold on the dark side. So, having day and night is a very good thing.

A. Circle the word or phrase that completes each sentence.

1.	Earth _____ stops rotating.	never	sometimes
2.	If we didn't have night and day, the weather would be _____.	normal	strange
3.	If it were always daytime where you lived, the weather would be too _____.	warm	cold
4.	It is cold at night because we are facing _____ the sun.	toward	away from

B. Answer the riddle.

I spin around all the time.
I should be dizzy, but I'm okay.
Part of me has the night.
The other part of me has day.

Who am I? _____

Name _____

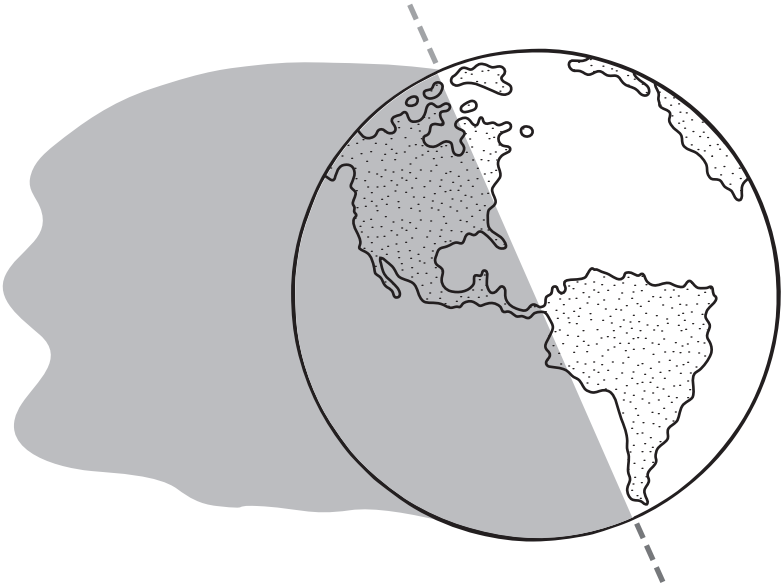
Daily Science
Big Idea 4
WEEK 1

Day 5

Weekly Question

What happens to the sun at night?

A. Look at the picture of Earth. Draw the sun to show where it is day. Draw stars to show where it is night.



B. Complete the paragraph. Use the words in the box.

Earth _____ once every 24 hours. When the sun shines on our half of Earth, it is _____. When the sun shines on the other side of Earth, it is _____ on our side. During the day, we see the _____. At night, we see the _____.

daytime
stars
rotates
sun
nighttime

The sun, moon, and stars all have predictable patterns of movement.

Week 2

Why aren't stars always in the same part of the sky at night?

Stars are enormous spheres of glowing gas (primarily hydrogen and helium) that give off a tremendous amount of heat and light. Stars exist in different sizes and colors. Blue stars are generally the hottest and biggest stars, while red stars are usually the smallest and coolest. Our sun is a medium-sized yellow star. In this week's lesson, students will learn that, like the sun, stars appear to move because Earth moves. One easy way to track the movement of stars is to observe constellations at night and to see how their positions change throughout the evening and throughout the year.

Day One

Vocabulary: *stars*

Distribute page 105 and introduce the vocabulary word. Point out that our sun is actually a nearby star. Have volunteers read the introduction aloud. Say: **The color and size of a star depend on its temperature. Stars that are medium sized and medium hot are yellow, like our sun. Small, cool stars are red; and big, hot stars are blue.** Distribute crayons and have students complete the activities. Review the answers as a group.

Day Two

Vocabulary: *constellation*

Draw a simple connect-the-dots picture on the board and have a volunteer complete the picture. Explain that for a long time, people have connected stars in the sky to make pictures. Distribute page 106. Introduce the vocabulary word and then have volunteers read the introduction aloud. Guide students through activity A. Ask students if they have ever seen the Big Dipper or Orion. If students are unfamiliar with Orion, point out that the stars form the shape of a hunter holding a bow and arrow. Help students find the three stars of his "belt." Then have students complete activity B.

Day Three

Materials: pictures of constellations (optional)

Distribute page 107 and have volunteers read the introduction aloud. To demonstrate the concept, you may want to hang pictures of constellations on the wall and have students "orbit" the room, noticing how they see different stars as they move around. Have students complete the activities. Review the answers together.

Day Four

Distribute page 108 and have volunteers read the introduction aloud. Explain that stars "move" at the same speed the sun does because Earth always spins at the same speed, but because the stars are so far away, they don't seem to move as far or as fast as the sun does. Have students complete the activities. Then review the answers together.

Day Five

Tell students they will review what they have learned about stars. Have students complete page 109. Then go over the answers together.

Name _____

Daily Science
Big Idea 4
WEEK 2

Day 1

Weekly Question

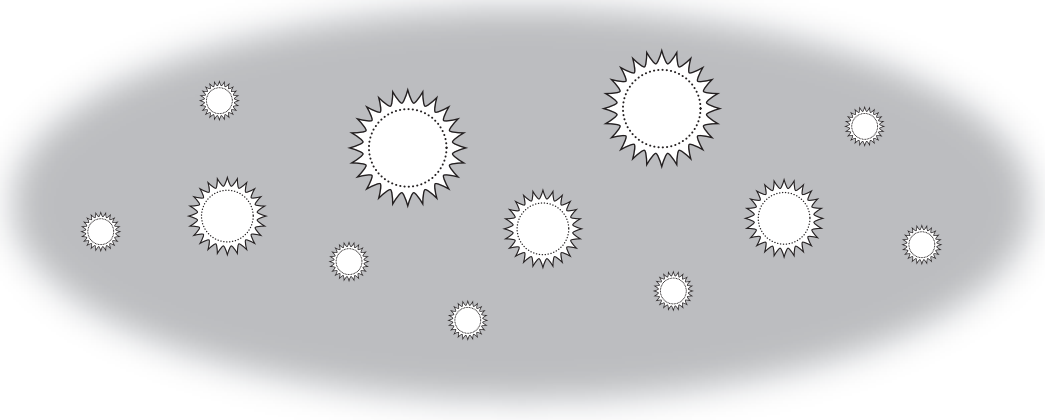
Why aren't stars always in the same part of the sky at night?

We see **stars** at night. They look like tiny dots in the sky, but they are actually very big. They just look small because they are far away. Stars can be different sizes and different colors. They can be red, blue, or yellow.

Vocabulary

stars
big balls of very hot gas that give off light and heat

A. Look at the stars below. Color the biggest stars blue. Color the smallest stars red. Color the other stars yellow.



B. Read each sentence. Circle **true** or **false**.

1. Stars are all the same size. true false
2. Stars can be pink, purple, or green. true false
3. Stars look small because they are very far away. true false
4. We see many stars during the day. true false

Name _____

Daily Science
Big Idea 4
WEEK 2

Day 2

Weekly Question

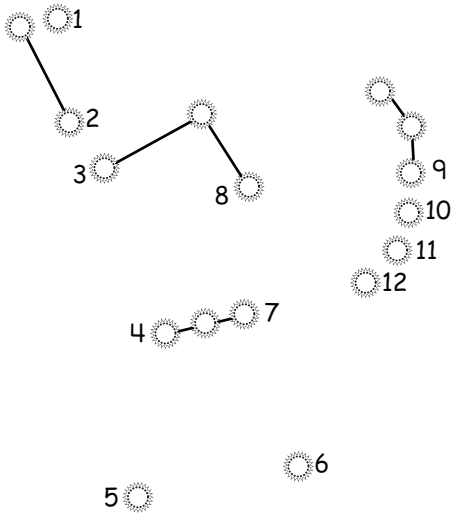
Why aren't stars always in the same part of the sky at night?

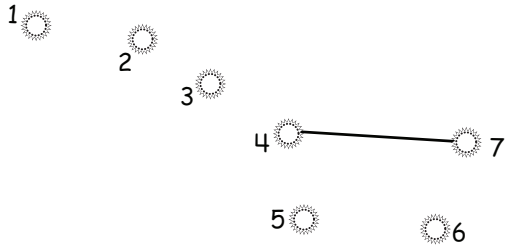
A long time ago, people noticed certain groups of stars. They thought these different groups made pictures. We call these pictures **constellations**. Some constellations are easy to recognize.

Vocabulary

constellation
a group of stars that form a picture and have a name

A. Connect the dots to form two constellations. They are called the "Big Dipper" and "Orion." Can you tell which one is which? Write their names below the pictures.





_____ _____

B. Circle the word that completes each sentence.

1. A constellation is a group of _____.

   suns stars planets

2. We can see the Big Dipper when it is _____.

   night day cloudy

Name _____

Daily Science
Big Idea 4
WEEK 2

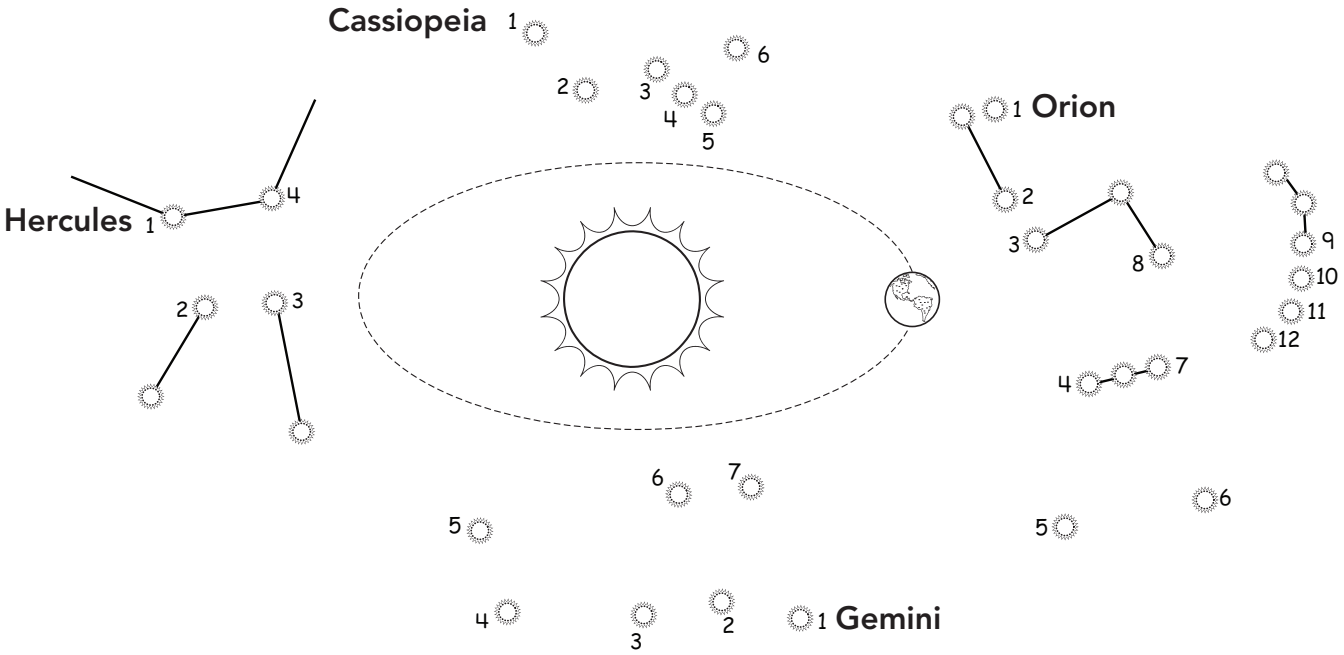
Day 3

Weekly Question

Why aren't stars always in the same part of the sky at night?

Earth travels through space as it moves around the sun. As Earth moves, we see different stars in the sky in different months. It is like looking out the window when you take a trip. Your view changes as you move.

A. Connect each set of dots to see four constellations.



B. Write a word to complete each sentence.

1. A _____ is a group of stars that form a picture.
2. Earth moves around the _____.
3. We see different constellations at different times because _____ moves.

Name _____

Daily Science
Big Idea 4
WEEK 2

Day 4

Weekly Question

Why aren't stars always in the same part of the sky at night?

Because Earth is always rotating, the stars change position in the night sky like the sun changes position during the day. Some constellations rise in the east and set in the west, but others stay in the sky all night.

A. Draw things that look like they move through the sky during the day and at night.

Day **Night**

B. Read each sentence. Circle **true** or **false**.

1. The stars seem to move in the sky. **true** **false**
2. Only the sun looks like it moves. **true** **false**
3. Some stars rise in the west and set in the east. **true** **false**

Name _____

Daily Science
Big Idea 4
WEEK 2

Day 5

Weekly Question

Why aren't stars always in the same part of the sky at night?

A. Complete the paragraph. Use the words in the box.

constellation **Earth** **star**

A _____ is a big ball of gas that gives off light and heat. A group of stars that form a picture is called a _____. We see different constellations during the year because _____ moves around the sun.

B. Read each question. Check the box next to the correct answer.

1. Why do stars look like they move across the sky?

❒ Earth rotates. ❒ Stars rotate.

2. Which of these is closer to Earth?

❒ the stars ❒ the sun

3. Which of these is harder to tell if it has changed position in the sky?

❒ a star ❒ the sun

The sun, moon, and stars all have predictable patterns of movement.

Week 3

Is the moon a planet?

Students often have a hard time understanding the difference between the moon and a planet because both are big, round objects found in space. However, a planet is a sphere made of rocky material or gas that orbits the sun. A moon, on the other hand, is a sphere of rocky material that orbits a planet, just like our moon orbits Earth. The moon is Earth's only natural satellite. The moon has no atmosphere, and its gravity is about one-sixth of Earth's gravity. Nobody knows for sure how our moon was formed, but the most accepted hypothesis is that the moon was once a part of Earth that split off after a giant meteor hit the planet while it was still forming.

Day One

Vocabulary: *moon, planet*

Activate prior knowledge by asking students what they know about the moon and whether or not they think the moon is a planet. Distribute page 111 and introduce the vocabulary before having volunteers read the introduction aloud. Then have students complete the activities. Review the answers together.

Day Two

Vocabulary: *orbit*

Materials: globe, lamp, tennis ball

Distribute page 112 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Demonstrate how Earth orbits the sun by moving the globe around the lamp. Demonstrate how the moon orbits Earth by moving the tennis ball around the globe. Then have students complete the activities. For activity A, you may wish to have students use two different colors to trace the orbits.

Day Three

Materials: pictures of Mars (optional)

Distribute page 113 and have volunteers read the introduction aloud. Have students complete the first two activities independently. For the oral activity, consider having students recall the properties of a planet and list them on the board. Guide students to connect the properties of a planet to Mars and then compare it to the moon. You might also show students pictures of Mars as part of the discussion.

Day Four

Vocabulary: *solar system*

Materials: yellow and gray crayons

Distribute page 114 and introduce the vocabulary word. Ask students if they know the names of the planets in our solar system, and list them on the board. (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune) Then have volunteers read the introduction aloud. Distribute crayons and have students complete the activities independently. When they have finished, invite students to share their answers.

Day Five

Tell students they will review everything they have learned about planets and the moon. Distribute crayons and have students complete page 115. Review the answers together.

Name _____

Daily Science
Big Idea 4
WEEK 3

Day 1

Weekly Question

Is the moon a planet?

Earth is a **planet**. It is not like the sun or stars. It does not give off its own light. It is made of rock. The **moon** is also made of rock and does not give off its own light. But the moon is much smaller than Earth.

Vocabulary

moon
a large object made of rock that moves around Earth

planet
a large object made of rock or gas that moves around the sun

A. Put a check next to the sentences that tell how Earth and the moon are the same.

___ Earth and the moon do not give off their own light.

___ Earth and the moon are the same size.

___ Earth and the moon are both made of rock.

B. Write a word to complete each sentence.

1. Earth is much _____ than the moon.

2. Stars give off their own _____.

Name _____

Daily Science
Big Idea 4
WEEK 3

Day 2

Weekly Question

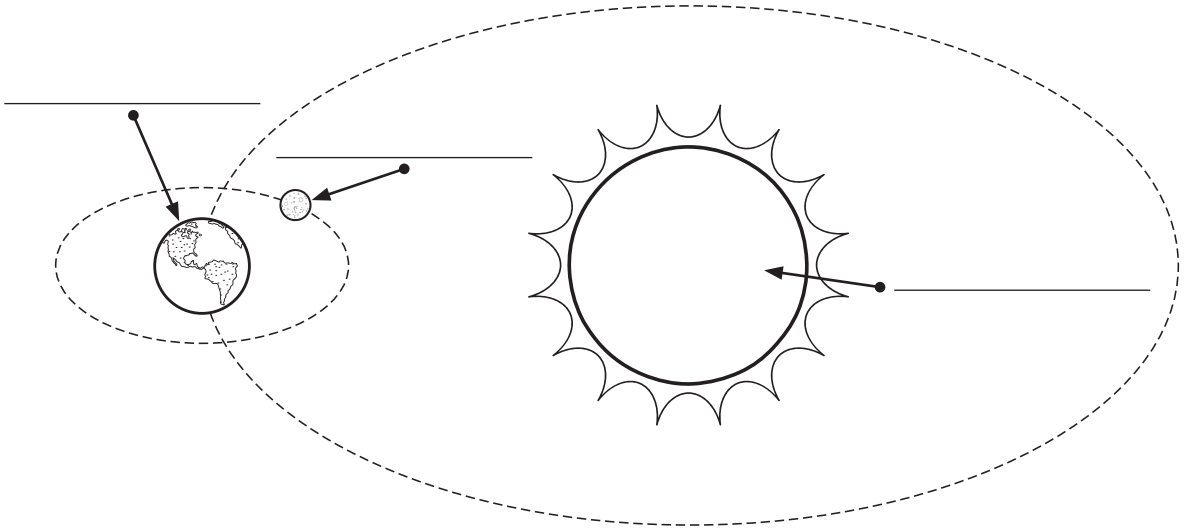
Is the moon a planet?

It takes 365 days for Earth to **orbit** the sun. Other planets orbit the sun, too. But the moon does not orbit the sun. It orbits Earth. It takes the moon 28 days to orbit Earth. Because the moon orbits Earth, it is not a planet.

Vocabulary

orbit
to move around something in a circular path

A. Look at the diagram. Trace the path of Earth's orbit around the sun. Trace the path of the moon's orbit around Earth. Label the **sun**, **moon**, and **Earth**.



B. Complete each sentence. Write the correct number.

1. Earth orbits the sun every _____ days.

2. The moon orbits Earth every _____ days.

Name _____

Daily Science
Big Idea 4
WEEK 3

Day 3

Weekly Question

Is the moon a planet?

Planets are big. Earth is big. But the moon is much smaller than Earth. You could fit about 50 moons inside Earth! All the other planets are bigger than the moon is.

A. Compare the size of Earth to the moon. Trace the circles around each plus sign. Label them **Earth** and **moon**.

_____

_____

B. Write the words to complete the sentences.

1. Planets are _____ than moons.

2. You could fit 50 _____ inside _____.

Talk

Mars is another planet that orbits our sun. Do you think Mars is bigger or smaller than our moon? Why do you think that? Tell your partner.

Name _____

Daily Science
Big Idea 4
WEEK 3

Day 4

Weekly Question

Is the moon a planet?

Earth is not the only planet that has a moon. Many planets in our **solar system** have moons. Mars has 2 moons. Jupiter has 63 moons! Moons can be very different from each other, but they do have one thing in common. They aren't planets!

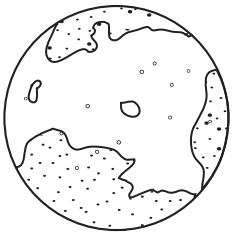
Vocabulary

solar system
the sun and the eight planets that orbit it

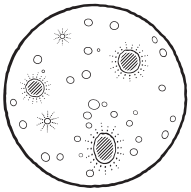
A. Read each sentence. Write **yes** or **no**.

1. Mars is a planet in our solar system. _____
2. Planets can have only one moon. _____

B. The picture below shows one of Jupiter's moons, called Io, next to our moon. Io is yellow and has volcanoes on it! Follow the directions to compare Io and our moon.



Io



our moon

1. Color Io yellow and our moon gray.
2. Which one is bigger, Io or our moon? _____
3. Compare our moon's surface to Io's surface. How are the surfaces alike or different?

_____

Name _____

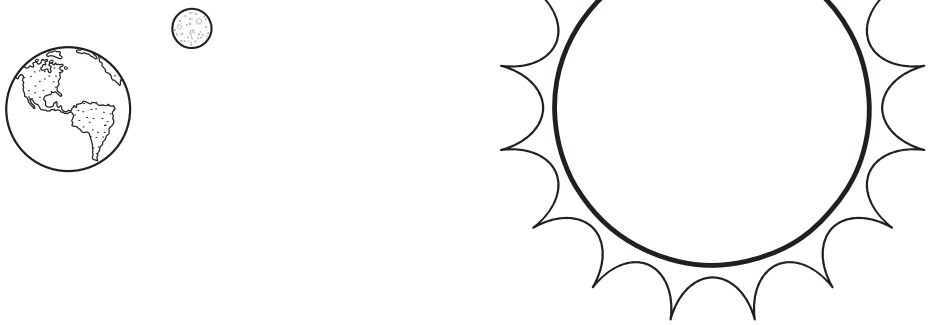
Daily Science
Big Idea 4
WEEK 3

Day 5

Weekly Question

Is the moon a planet?

A. Draw a green line to show the moon's orbit.
Draw a red line to show Earth's orbit.



B. Circle the word that completes each sentence.

1.	Earth is a _____ that orbits the sun.	moon	planet
2.	The moon is not _____.	rocky	a planet
3.	The moon is much _____ than Earth.	smaller	bigger

C. Why isn't the moon a planet?

_____

Week 4

Why does the moon change shape?

The sun, moon, and stars all have predictable patterns of movement.

In this week's lesson, students will learn that the moon doesn't actually change shape—it just appears to change as it orbits Earth. The moon takes roughly 28 days to complete one orbit. The moon also takes 28 days to rotate. This means that the same side of the moon always faces Earth. The part we see changes, depending on the position of the moon in its orbit around Earth. A full moon is "day" on the side of the moon that faces us, while a new moon is "night."

Day One

Vocabulary: *reflect*

Materials: flashlight, large ball of aluminum foil

Distribute page 117 and introduce the vocabulary word. Then briefly review that the sun is a star; it gives off its own light. To demonstrate how sunlight reflects off the moon, turn off the lights and use the flashlight to create a reflection off the foil ball. Say: **The moon reflects light just like this ball does.** Have volunteers read aloud the introduction. Then have students complete activity A. For activity B, you may want students to brainstorm answers in pairs before writing their responses.

Day Two

Materials: flashlight, large foil ball; yellow and black crayons

Distribute page 118 and have volunteers read the introduction aloud. Hold the foil ball up in the air while a volunteer stands to one side and shines the light on it. Then have students take turns being "Earth" as you hold the ball in different places around them. The flashlight holder should stay still, continuing to shine the light without changing the direction of the beam. Have the student being Earth describe how the light seems to change depending on where the ball is. Then distribute crayons and have students complete the activities.

Day Three

Vocabulary: *phase*

Materials: flashlight, foil ball, globe (optional)

Distribute page 119 and introduce the vocabulary word before having volunteers read the introduction aloud. Point out the illustrations on the page. Ask: **Which part of each moon shows where the sunlight hits it?** (the white part) You may want to use the flashlight, globe, and foil to demonstrate the new, quarter, and full moon phases. Then have students complete the first activity. For the oral activity, pair students or discuss the questions as a group. Invite students to explain their answers by using the flashlight, globe, and foil ball.

Day Four

Vocabulary: *eclipse*

Materials: flashlight, foil ball, globe

Distribute page 120 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Use the flashlight, ball, and globe to demonstrate a solar eclipse. Then help students read the chart and guide them through the activity.

Day Five

Tell students they will review what they have learned about phases of the moon. Have students complete page 121. Review the answers together.

Name _____

Daily Science
Big Idea 4
WEEK 4

Day 1

Weekly Question

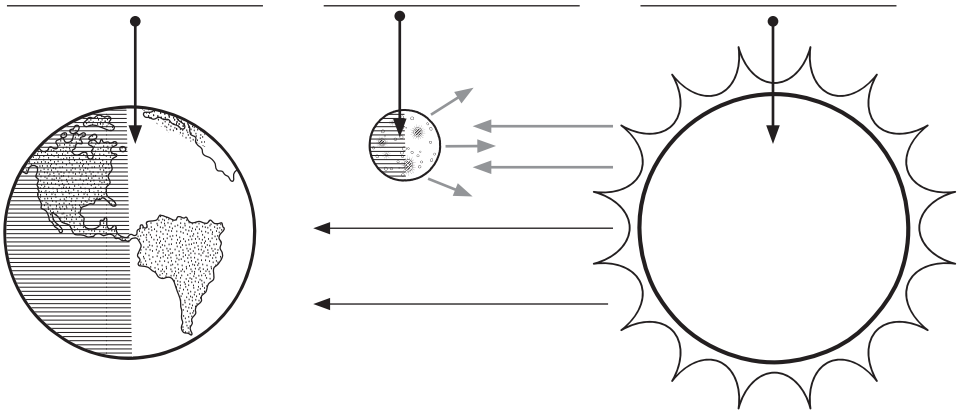
Why does the moon change shape?

When we see the moon at night, it looks like it is shining. But it isn't. The moon is not a star. It does not make its own light. The moon **reflects** light from the sun.

Vocabulary

reflect
to bounce off a surface

A. Look at the diagram. Label the **sun**, the **moon**, and **Earth**.



B. Answer each question.

1. How do we know that the moon is not a star?

_____

2. What else can you think of that reflects light? Write two things.

_____ _____

Name _____

Daily Science
Big Idea 4
WEEK 4

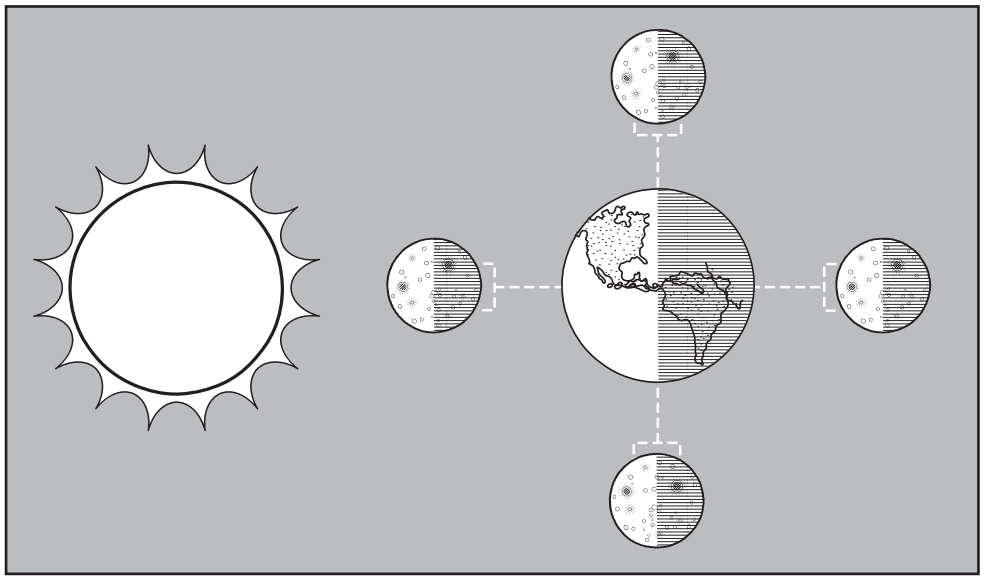
Day 2

Weekly Question

Why does the moon change shape?

The sun is always shining on the moon. But we can't always see the whole area of the moon that is lit up. That's because the moon is orbiting Earth. As the moon moves, we see its lit-up side from different angles, so its shape seems to change. The shape we see depends on where the moon is in its orbit.

A. Use yellow to color the parts of the moon that are lit up by the sun. Use black to color the parts that are NOT lit by the sun.



B. Read each sentence. Write **true** or **false**.

1. The sun is always shining on the moon. _____
2. We always see the moon from the same angle. _____
3. The shape of the moon changes because Earth orbits the sun. _____

Name _____

Daily Science

Big Idea 4

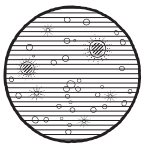
WEEK 4

Day 3

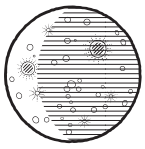
Weekly Question

Why does the moon change shape?

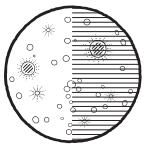
It takes 28 days for the moon to orbit Earth. During that time, the moon will change its shape from a new moon to a full moon and back again. Each time the moon changes shape, we say it is in a different **phase**.



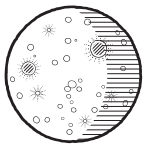
new moon



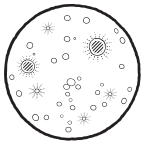
crescent moon



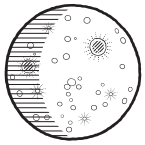
quarter moon



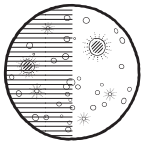
gibbous moon



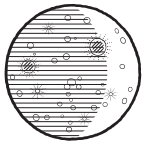
full moon



gibbous moon

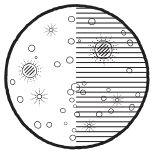


quarter moon



crescent moon

Look at each picture below. Write the name of the moon phase. Use the pictures above to help you.



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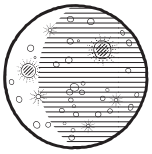
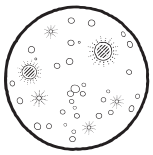


_____



_____

Talk

What might we see if the moon stayed in one place and did not orbit Earth? Would the moon have phases? Talk about it with a partner.

Vocabulary

phase
a different shape of the moon as it orbits Earth

Name _____

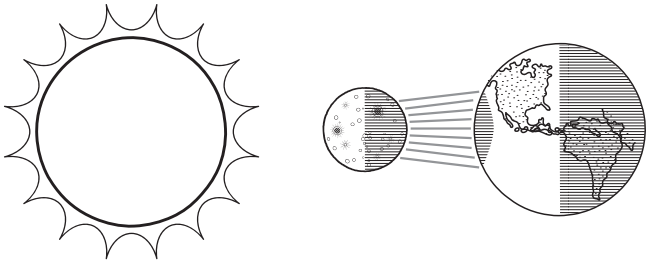
Daily Science
Big Idea 4
WEEK 4

Day 4

Weekly Question

Why does the moon change shape?

Sometimes the moon moves between Earth and the sun. Then we can't see the sun for a short time. This is called an **eclipse**. A long time ago, people thought an eclipse meant something was eating the sun! But today we know it's just the moon blocking the sun and making a shadow on Earth.



Vocabulary

eclipse
when the moon moves between Earth and the sun and blocks our view of the sun

Read the chart. Write the date of the eclipse to answer each question.

Date of eclipse	Where it was seen	How long it lasted
December 24, 1973	Central and South America, Africa	12 minutes
July 22, 1990	Europe and Asia	2.5 minutes
June 21, 2001	South America, Africa	5 minutes

1. When was the longest eclipse? _____

2. When was the shortest eclipse? _____

3. Which eclipse was NOT seen in Africa? _____

Name _____

Daily Science
Big Idea 4
WEEK 4

Day 5

Weekly Question

Why does the moon change shape?

A. Draw these phases of the moon.

gibbous moon

quarter moon

crescent moon

B. Complete the paragraph. Use the words in the box.

angles **phase** **orbits** **reflecting**

As the moon _____ Earth, it seems to change shape. Each shape is called a _____ of the moon. But the moon is not really changing shape. It is _____ light from the sun. We see the light from different _____.

Name _____

Daily Science
Big Idea 4
WEEK 5

Unit Review

Comprehension

Looking at the Sky

A. Read each question. Fill in the bubble next to the correct answer.

1. Why don't we see the sun at night?

Ⓐ The sun has moved to the other side of Earth.

Ⓑ Our part of Earth has turned away from the sun.

Ⓒ Earth stops rotating at night and takes a rest.

2. Why do some constellations change position in the night sky during the year?

Ⓐ The sun outshines the stars.

Ⓑ The moon has phases.

Ⓒ Earth moves through space.

3. The moon is not a planet because it _____.

Ⓐ orbits Earth instead of the sun

Ⓑ makes its own light

Ⓒ is too large to be a planet

4. As the moon changes phases, it _____.

Ⓐ makes its own light

Ⓑ moves faster

Ⓒ seems to change shape

B. Read each sentence. Circle **true** or **false**.

1. During an eclipse, we can't see the sun. **true** **false**

2. A constellation is a group of stars and moons. **true** **false**

Name _____

Daily Science

Big Idea 4

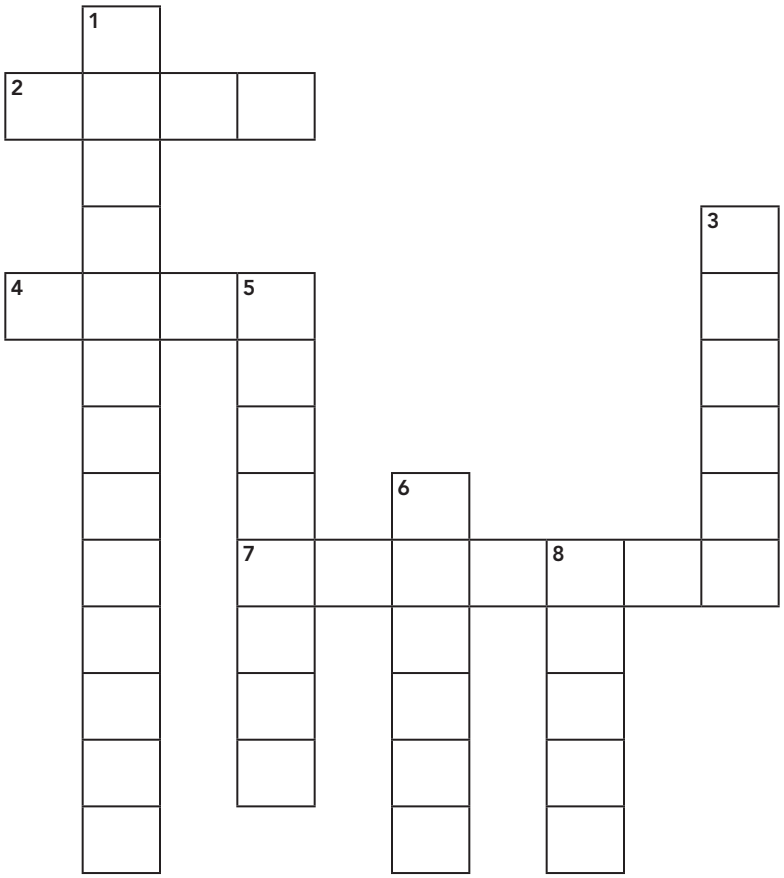
WEEK 5

Unit Review

Vocabulary

Crossword Puzzle

Use the words in the box and the clues below to solve the puzzle.



reflects

eclipse

star

rotate

phase

planet

constellation

moon

DOWN

1. The Big Dipper is one.

3. It takes Earth 24 hours to do this.

5. The moon _____ light.

6. a large object that orbits the sun

8. When the moon looks like it changes shape, it is in a new _____.

ACROSS

2. the object made of rock that moves around Earth

4. a ball of hot gases

7. An _____ happens when the moon blocks the sun.

Name _____

Unit Review

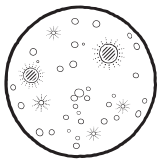
Visual Literacy

Matching Moons

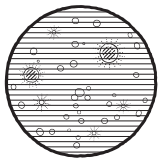
Daily Science Big Idea 4 WEEK 5

Draw a line to match each moon phase with the sentence that tells about it.

1. **Full Moon** •

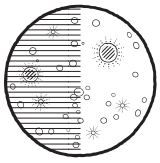


2. **New Moon** •



3. **Crescent Moon** •

4. **Quarter Moon** •



- We don't see any of the lit-up side of the moon.
- We see the whole side of the moon that is lit by the sun.
- We see half of the side of the moon that is lit by the sun.
- The lit-up part of the moon looks like the letter C.

Name _____

Daily Science
Big Idea 4
WEEK 5

Unit Review

Hands-on Activity

Observing Shadows

Try this simple activity to see how the sun changes positions in the sky as Earth rotates.

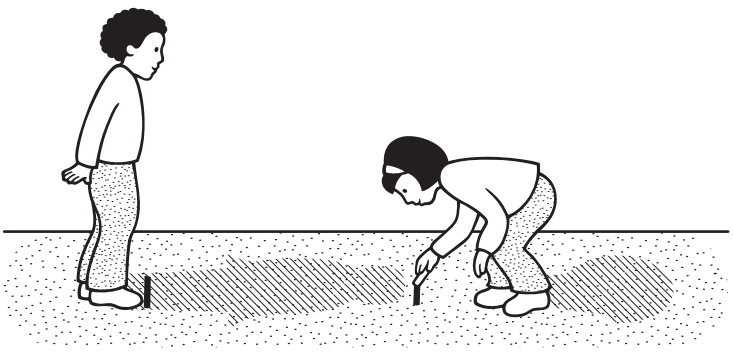
What You Need

- chalk
- a place on the playground or blacktop that is sunny all day
- a partner

1. In the morning, stand on the playground with the sun behind you. Look for your shadow.
2. Use chalk to mark the place where you are standing. Have your partner mark the place where your shadow ends.
3. Then draw a line to connect the two marks.
4. In the afternoon, go back to the same place. Stand on your first mark. Have your partner mark where your shadow ends now.

What Did You Discover?

1. Did both shadows point in the same direction? _____
2. Were your shadows the same length? _____
3. Was the sun in the same place in the sky? _____



Sounds are made by vibrating objects. Sounds can travel through solids, liquids, and gases.

Key Concepts
Sound and Vibration

National Standard
Sound is produced by vibrating objects. The pitch of the sound can be varied by changing the rate of vibration.

Second-grade students should be able to recognize different sounds and the source of the sounds. However, they may have difficulty understanding how the sounds are made. This Big Idea teaches students that:

- all sounds come from vibrations;
- sound travels as waves;
- sound waves travel through solids, liquids, and gases; and
- animals sense sound waves with special body parts.

Teacher Background

Sound waves are considered mechanical waves because they need a medium to travel through. The medium can be a solid, liquid, or gas. Sound cannot travel through a vacuum, such as outer space, because there is nothing to conduct the waves.

Sound travels slowest through a gas, faster through a liquid, and fastest through a solid. This is due to the fact that sound is caused by vibrating molecules, and in denser matter there are more molecules to vibrate against one another. The speed of sound traveling through the air is 768 miles per hour, but its speed traveling through steel is over 13,000 miles per hour.

Sound waves don't make an actual "sound." Most animals, including insects and aquatic animals, have some sort of "ear" that decodes the vibration into sound. So there *is* an answer to that famous question, "If a tree falls in the forest and no one is around to hear it, does it make a sound?" The answer is no!

For specific background information on each week's concepts, refer to the notes on pp. 128, 134, 140, and 146.

Unit Overview

WEEK 1: How do crickets chirp?

Connection to the Big Idea: Students learn that a cricket's chirp is created by vibrations.

Students begin by discovering that vibrations create sound. They learn that crickets rub their wings together to chirp. Students also learn that sound can be described in terms of pitch and volume.

Content Vocabulary: *file, pitch, scraper, sound, vibrations, volume*

WEEK 2: Where do echoes come from?

Connection to the Big Idea: Students learn that echoes are caused by sound waves bouncing off a surface.

Students first discover that sound vibrations travel in waves. Students explore how these waves travel through the air, sometimes reflecting off hard surfaces and returning to the source of the sound to make an echo. Students then learn how some animals use echoes to navigate and to find food.

Content Vocabulary: *echo, echolocation, reflect, waves*

WEEK 3: Does sound travel underwater?

Connection to the Big Idea: Students learn that sound travels through solids, liquids, and gases.

Students discover that sound is the result of molecules vibrating against each other, and that sound travels slowest through air, faster through a liquid, and fastest through a solid.

Content Vocabulary: *molecule, surface*

WEEK 4: How do animals without ears hear?

Connection to the Big Idea: Students learn that most animals detect vibrations and decode them as sound.

Students learn that humans and many animals have an outer, middle, and inner ear to receive and decode sound waves. Students then discover that even animals without visible (outer) ears or middle ears can still decode the vibrations caused by sound waves.

Content Vocabulary: *detect, inner ear, middle ear, outer ear*

WEEK 5: Unit Review

You may choose to do these activities to review concepts of sound and vibrations.

p. 152: Comprehension Students answer multiple-choice questions about key concepts in the unit.

p. 153: Vocabulary Students match key vocabulary words to their definitions.

p. 154: Visual Literacy Students match captions to pictures of a bat using echolocation to catch an insect.

p. 155: Hands-on Activity Students experiment with sound waves by making a plastic-cup telephone. The instructions and materials needed for the activity are listed on the student page.

Sounds are made by vibrating objects.

Week 1

How do crickets chirp?

Crickets have two sets of wings. Male crickets chirp by creating vibrations with their front set of wings. They rub the hard, smooth scraper of one wing across the ribbed file of the other wing. The resulting vibrations resonate across membranes of each wing, called harps. Larger harps create louder chirps. Male crickets chirp to attract mates and repel other males. There are about 900 cricket species, and each species of cricket has a unique chirp.

Day One

Vocabulary: *sound, vibrations*

Materials: rubber band, radio, paper plate, confetti

Distribute page 129 and introduce the vocabulary. Then read aloud the introduction. To demonstrate vibration, stretch the rubber band between your fingers and pluck it. Point out that the band is moving back and forth. Then turn the radio on its back so its speakers face up. Place a paper plate with confetti on one speaker and turn the radio on loudly enough to make the confetti move. Explain that back-and-forth movements (vibrations) coming from the speakers create energy that you hear (sound) and cause the paper to bounce and vibrate. Have students complete the activities. For activity B, help students brainstorm objects to draw (e.g., drum, bee, phone, etc.) and sound words to describe them (boom, buzz, ring, etc.).

Day Two

Materials: sheet of paper

Hold up a sheet of paper. Ask: **Can you hear this paper?** (no) Shake it. Ask: **Can you hear it now?** (yes) Remind students that vibrations cause sound. Distribute crayons and page 130. Have volunteers read the introduction aloud before students complete the activities. Go over the answers together.

Day Three

Vocabulary: *file, scraper*

Materials: comb; rulers and spiral notebooks for each group of students

Say: **Crickets have special wings.** Then rub the teeth of a comb with a pencil and say: **The wings of a cricket are like this comb and pencil.** Distribute page 131. Introduce the vocabulary and have volunteers read the introduction aloud. Distribute crayons and have students complete the first two activities. For activity C, provide spiral notebooks and rulers. Then have students complete the activity in small groups.

Day Four

Vocabulary: *pitch, volume*

Distribute page 132 and introduce the vocabulary. Then have volunteers read the introduction aloud. Demonstrate the concept of volume by clapping your hands together softly and then loudly. Ask: **Which clap was the loudest?** Next, demonstrate the concept of pitch by speaking in a deep voice and then in a high voice. Ask: **Which voice was the lowest?** Brainstorm different sounds and discuss the volume and pitch of each. Then have students complete the activities.

Day Five

Tell students they will review what they have learned about sound and crickets. Have students complete page 133. Go over the answers together.

Name _____

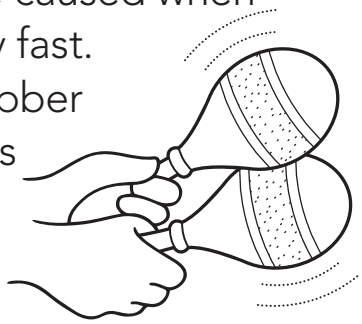
Daily Science
Big Idea 5
WEEK 1

Day 1

Weekly Question

How do crickets chirp?

To understand a cricket's chirp, first you have to understand **vibrations**. Vibrations are caused when something moves back and forth very fast. When you shake a rattle or pluck a rubber band, you create vibrations. Vibrations travel through the air to your ears. That's when you hear **sound**.



Vocabulary

sound
energy that you hear

vibrations
fast back-and-forth movements

A. Circle the word that completes the sentence.

Sounds are made by _____.

air vibrations ears

B. Draw a picture that shows something making a sound. Then write two words to describe that sound.

Sound Words

1. _____

2. _____

C. Touch your throat and hum. What do you feel? Write your answer.

_____

Name _____

Daily Science
Big Idea 5
WEEK 1

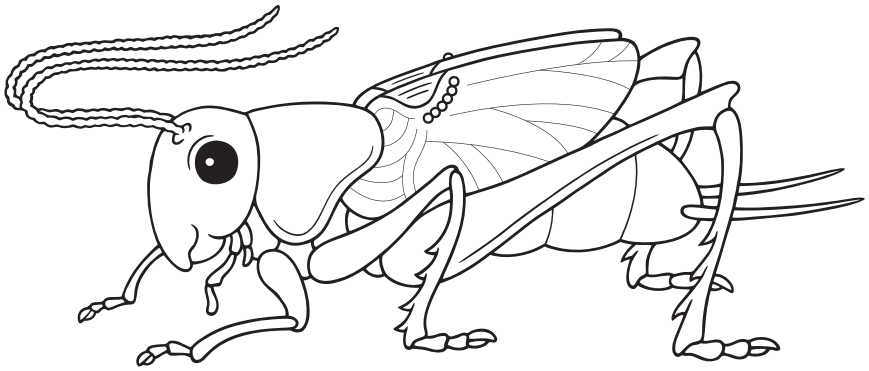
Day 2

Weekly Question

How do crickets chirp?

Have you ever heard crickets chirping at night? Like every other animal that makes a sound, crickets use a special part of their body to create vibrations. They don't use their mouths like we do. Crickets use their wings!

A. Look at the picture of the cricket. Color the body part it uses to chirp.



B. Complete the sentences. Use words from the paragraph above.

A cricket's chirp is a _____ that we can hear.

It is caused by _____.

C. Read each sentence. Write **true** or **false**.

1. Only crickets use vibrations to make sound. _____
2. When a cricket chirps, it moves a special part of its body back and forth quickly. _____

Name _____

Daily Science
Big Idea 5
WEEK 1

Day 3

Weekly Question

How do crickets chirp?

Male crickets have special wings that can make noise. Their wings have a bumpy edge. This is called the **file**. Their wings also have a hard, smooth edge. This is called the **scraper**. The cricket rubs the scraper over the file. The wings vibrate and make a chirping sound.

Vocabulary

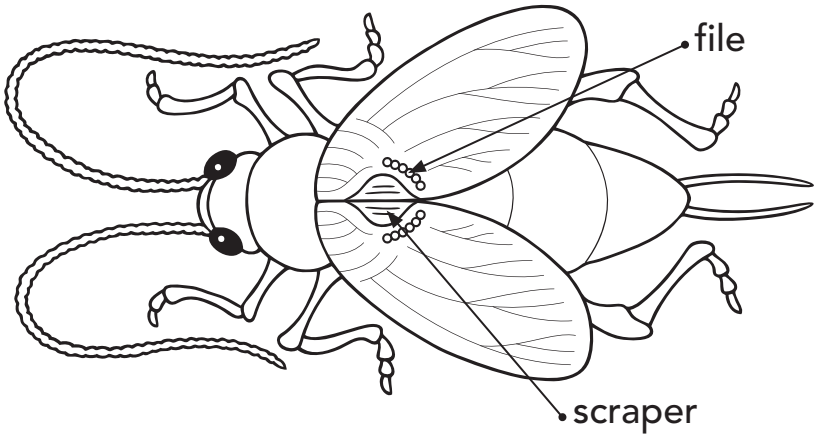
file
the bumpy edge of a male cricket's wing

scraper
the smooth edge of a male cricket's wing

A. Which crickets chirp? Circle the answer.

all crickets male crickets female crickets

B. Look at the picture. Color the wings. Circle the **file** and **scraper**.



C. Use a spiral notebook and a ruler to "chirp" like a cricket. Rub the ruler along the wire spirals. Then answer the questions.

1. Which one is like the **file**, the spirals or the ruler? _____

2. Which one is like the **scraper**? _____

Name _____

Daily Science
Big Idea 5
WEEK 1

Day 4

Weekly Question

How do crickets chirp?

Volume is how loud or soft a sound is. When you whisper, your voice has a soft volume. When you yell, the volume of your voice is loud. Crickets are tiny, but the volume of their chirp is loud.

Pitch is how high or low the sound is. The pitch of a cricket's chirp is higher than a frog's croak. A dog's bark has a lower pitch than a bird's song.

Vocabulary

pitch
how high or low a sound is

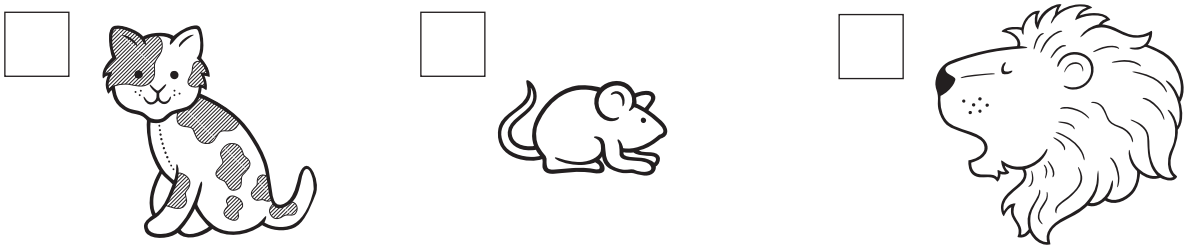
volume
how loud or soft a sound is

A. Circle the correct answer.

1. The volume of a lion's roar is _____. loud soft

2. The pitch of a bird's song is _____. high low

B. Look at the pictures. How loud is each animal? Number the animals in order of softest to loudest volume.



C. Think of something with a high pitch and something with a low pitch. Complete the sentences.

1. _____ has a high pitch.

2. _____ has a low pitch.

Name _____

Daily Science
Big Idea 5
WEEK 1

Day 5

Weekly Question

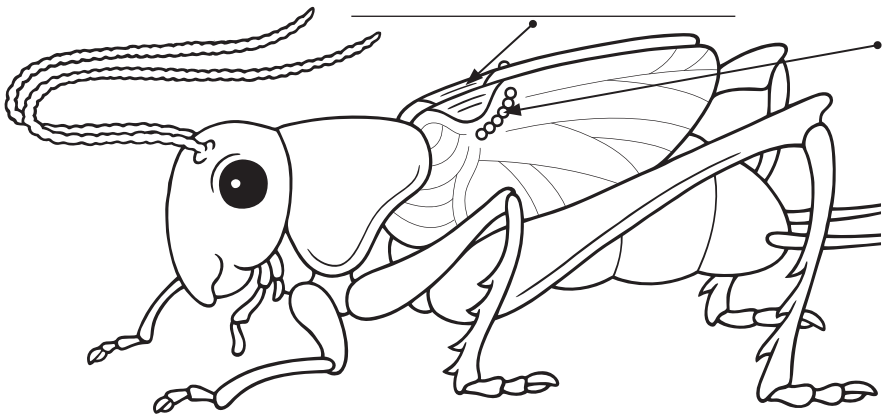
How do crickets chirp?

A. Circle the word that completes the sentence.

A cricket uses its _____ to chirp.

legs mouth wings

B. Label the **file** and **scraper** on the picture below.



C. Complete the paragraph. Use the words in the box.

pitch **sound** **vibrations** **volume**

Quick movements back and forth are called _____. They make _____. A cricket's chirp has a loud _____. A cricket's chirp has a higher _____ than a frog's croak.

Sounds are made by vibrating objects.

Week 2

Where do echoes come from?

This week, students will learn that, like other kinds of waves, sound waves can reflect off the surfaces they hit. When a sound wave reflects and returns to its source, it is called an echo. Strong, clear echoes occur when sound waves bounce off large, flat, hard surfaces, such as brick or wooden walls. With radar, we can use echoes to see what is in the sky and in the sea. Many animals also use echoes to help them find food or to navigate.

Day One

Vocabulary: *waves*

Distribute page 135 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Say: **Sound waves move in all directions, like the ripples of water you see when you throw a stone into a pond.** Have students complete the activities. Then go over the answers together.

Day Two

Vocabulary: *reflect*

Materials: ball, mirror

Distribute page 136 and introduce the vocabulary word. To demonstrate its meaning, throw the ball against the wall or bounce it off the floor. Say: **The ball bounces, or reflects, off the wall** (or floor). Then hold up the mirror and move it to reflect light from lights in the room. Say: **This mirror reflects light. The light bounces off the mirror. Some things reflect sound waves, too.** Have volunteers read the introduction aloud. Then have students complete the first two activities. For the oral activity, pair students or discuss the question as a group.

Day Three

Vocabulary: *echo*

Distribute page 137, introduce the vocabulary word, and read aloud the introduction. Have students name places where they have heard an echo. List the places on the board and discuss what each of these places has in common. (hard, flat surfaces) Then have students complete the activities.

Day Four

Vocabulary: *echolocation*

Distribute page 138 and introduce the vocabulary word. Then have volunteers read the introduction aloud. Explain that a shrew is an animal similar to a mouse. Then brainstorm with students some other ways echoes might be useful for bats. (to avoid things in the dark, to find other bats, and so on) Have students complete the first activity. Before they complete the oral activity, discuss traits of dolphins and whales, such as how they need to eat a lot, don't have many natural enemies, and like to be around other dolphins and whales. (Therefore, they might use echolocation to find each other, to look for food, etc.)

Day Five

Tell students they will review what they have learned about echoes. Distribute crayons and have students complete page 139. Then go over the answers together.

Name _____

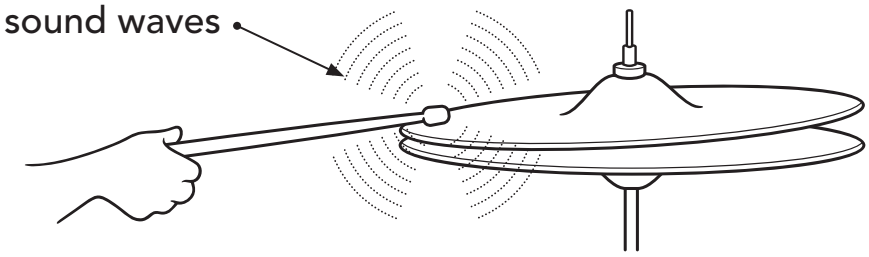
Daily Science
Big Idea 5
WEEK 2

Day 1

Weekly Question

Where do echoes come from?

Sound travels in **waves**, a lot like the way water travels in waves across the ocean. Sound waves travel in all directions. Everything that makes a sound sends sound waves through the air.



Vocabulary

waves
ripples of energy

A. Complete the sentences. Use the words in the box.

travel	waves	sound

1. When you hit a cymbal, it vibrates. This creates sound _____.
2. The sound waves _____ in all directions.
3. We hear the waves of vibrations as _____.

B. Read each sentence. Circle **true** or **false**.

1. We can see sound waves in the air. **true** **false**
2. Sound waves travel in all directions. **true** **false**

Name _____

Daily Science
Big Idea 5
WEEK 2

Day 2

Weekly Question

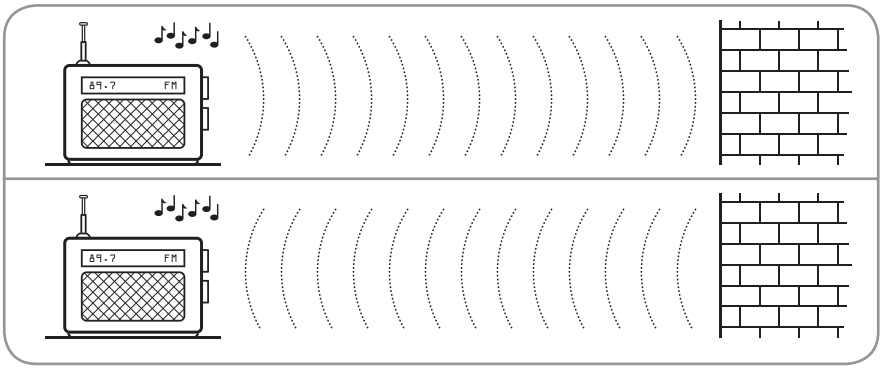
Where do echoes come from?

As sound waves move, they sometimes hit things. When a sound wave hits something, such as a wall, it will **reflect**, or bounce back. The sound wave keeps moving, but it changes direction.

Vocabulary

reflect
to bounce back from something

A. Look at the picture below. Put a check by the caption that describes the picture.



❒ **Sound waves reflect off the radio.** ❒ **Sound waves reflect off the wall.**

B. Complete the sentences. Use the words in the box.

direction **reflect**

1. Sound waves _____ when they hit something.

2. When a sound wave reflects, it changes _____.

Talk

What else can you use the word **reflect** to talk about, besides sound waves? Tell your partner.

Name _____

Daily Science
Big Idea 5
WEEK 2

Day 3

Weekly Question

Where do echoes come from?

When a sound wave reflects back to us, we hear the sound again. It's called an **echo**. The clearest echoes are made when sound waves reflect off something hard and flat, such as a wall or large rock. Sound waves do not make good echoes when they hit soft or bumpy objects.

Vocabulary

echo
sound waves that reflect back and are heard again

A. In the first picture, draw sound waves leaving the man and hitting the wall. In the second picture, draw sound waves returning to the man so that he hears an echo.

B. Read each sentence. Circle **true** or **false**.

1. A sound wave will make a better echo if it reflects off grass than if it reflects off rock. true false

2. A sound wave that does NOT reflect back to us is an echo. true false

Name _____

Daily Science
Big Idea 5
WEEK 2

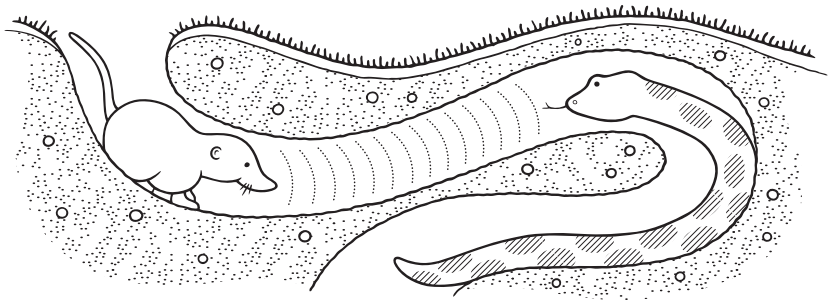
Day 4

Weekly Question

Where do echoes come from?

Many animals use echoes to survive. For example, bats use echoes to find food. They send out sound waves that bounce off insects. An echo tells a bat how far away and how big the insect is! This is called **echolocation**.

Shrews are another example. They use echolocation to find out if dangerous animals are in their tunnels.



Vocabulary

echolocation
a way that some animals use sound waves to find things

Fill in the bubble next to the correct answer.

1. Why do bats use echolocation?
   Ⓐ to find food Ⓑ to kill snakes Ⓒ to stay warm

2. What can a shrew tell from an echo?
   Ⓐ It is nighttime. Ⓑ A snake is near. Ⓒ A storm is coming.

Talk

Whales and dolphins both use echolocation. Do you think they use it like bats to find food, or like shrews to stay away from danger? Why do you think that? Tell your partner.

Name _____

Daily Science
Big Idea 5
WEEK 2

Day 5

Weekly Question

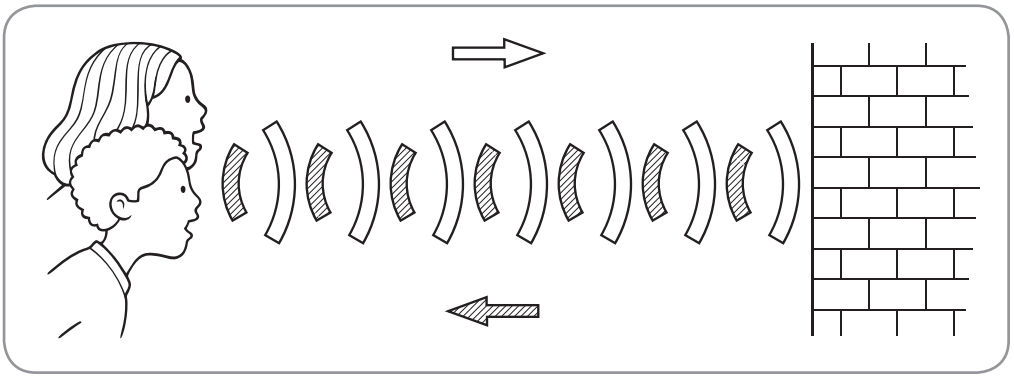
Where do echoes come from?

A. Complete the paragraph. Use the words in the box.

echo **reflected** **sound waves**

When sound vibrations travel, they are called _____. As a sound wave moves, it can hit something and be _____. This causes the wave to move in another direction. If the sound wave returns to us, we hear it as an _____.

B. Color the picture. Use blue to color the sound waves coming from the children. Use green to color the ones bouncing back. Use red to color the object that is causing an echo.



C. Write a sentence about the picture above. Use the word **echo**.

_____

Sounds are made by vibrating objects.

Week 3

Does sound travel underwater?

Students probably assume that sound travels only through air. This is a reasonable assumption, given that the human ear is designed to best pick up sound waves in the air. However, sound waves travel through all forms of matter: gas, liquid, and solid. Energy from sound waves compresses and expands air molecules as it moves outward, so the shape and movement of the wave looks like an accordion expanding and contracting. Without molecules to convey this energy, sound waves wouldn't travel, which is why there is no sound in space.

Day One

Vocabulary: *surface*

Poll the class to find out who thinks sound travels underwater. Have volunteers explain their reasons. Then distribute page 141 and introduce the vocabulary word before having volunteers read the introduction aloud. Have students complete the activity. Go over the answers together.

Day Two

Vocabulary: *molecule*

Materials: Slinky™ spring

Distribute page 142 and introduce the vocabulary. Explain that molecules are everywhere, including the air. Read the introduction aloud, pausing after the reference to a Slinky. Demonstrate how sound waves move by compressing and expanding the Slinky. Finish the introduction and point out the picture on the page. Explain that this is what a sound wave looks like. Then guide students through the activities. For the oral activity, pair students or discuss the questions as a group.

Day Three

Distribute page 143 and have volunteers read the introduction aloud. Explain that sound waves can travel through anything that has molecules, including liquids and gases. Then have students complete the activities. Invite volunteers to share their responses for activity B.

Day Four

Distribute page 144 and have volunteers read the introduction aloud. Have students complete activity A, making sure they don't hit their desks too hard. For activity B, lead a discussion about how the stethoscope works. Explain that sound waves travel through the chest (a solid) into the diaphragm (a solid) and through a hollow tube to the doctor's ears. Collaborate on a sentence that explains how the stethoscope works, and then have students copy it onto their papers.

Day Five

Tell students they will review what they have learned about sound traveling through different kinds of matter. Have students complete page 145. Then go over the answers together.

Name _____

Daily Science
Big Idea 5
WEEK 3

Day 1

Weekly Question

Does sound travel underwater?

For a long time, scientists thought that there was not much sound in the ocean. That's because people can't hear sound very well underwater. Our ears are made to hear sounds in the air. Also, sounds made above water don't travel through the water. They reflect off the water's **surface**. So scientists didn't hear much when they were actually in the ocean!

Vocabulary

surface
the top or outside of something

Read each sentence. Write **true** or **false**.

1. You can hear a sound in a swimming pool better than in a kitchen. _____
2. Sound waves from the water reflect off the air's surface. _____
3. Our ears are made to hear sounds in the air. _____

Name _____

Daily Science
Big Idea 5
WEEK 3

Weekly Question

Day 2 Does sound travel underwater?

Remember that sound waves are ripples of energy. This energy makes **molecules** in the air move back and forth like a Slinky™. Molecules are tiny bits of matter that are too small to see, but they are everywhere! Molecules help sound waves travel. If there were no molecules to move back and forth, there would be no sound.

Vocabulary

molecule
a tiny particle, or piece of matter, that you can't see

A. Answer each question. Write **yes** or **no**.

1. Can sound travel without molecules? _____

2. Is a molecule big enough to see? _____

B. Number the sentences to show the correct order for how a bell's sound waves travel.

___ Air molecules move back and forth as the sound wave travels.

___ A bell is rung.

___ The bell's ringer creates a sound wave.

Talk

In space, there are no air molecules. Do you think sound waves can still travel? Why or why not? Tell your partner.

Name _____

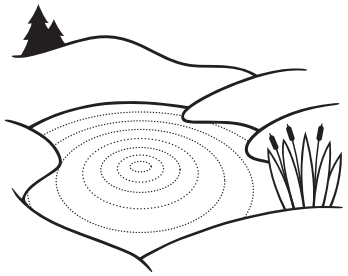
Daily Science
Big Idea 5
WEEK 3

Day 3

Weekly Question

Does sound travel underwater?

Because liquids are made of molecules, sound waves can travel through water. The sound waves move the molecules in liquids just as they do in the air. In fact, sound waves move better through liquids! That's because liquids have more molecules closer together.



A. Fill in the bubble next to the correct answer.

1. How are air and liquid alike?

Ⓐ Neither of them lets sound waves travel.
Ⓑ Both have molecules.
Ⓒ Our ears can hear sound well in both.

2. Why can sound travel underwater?

Ⓐ because it moves the water molecules
Ⓑ because it moves slowly
Ⓒ because it uses bubbles to travel

3. How are sound waves like ripples in a pond?

Ⓐ They are both made of water.
Ⓑ They are both caused by the wind.
Ⓒ They both move out in all directions.

B. Which one would win a race, a sound wave in the air or a sound wave in the water? Why? Write a sentence to answer the question.

_____

Name _____

Daily Science
Big Idea 5
WEEK 3

Day 4

Weekly Question

Does sound travel underwater?

If sound can move through air and liquids, can it move through solids, too? Yes! Solids, like liquids and gases, have molecules. That's why you can sometimes hear sound through walls.

In fact, the only place where you couldn't hear sound is in space. There are no molecules in space, so sound waves can't travel anywhere.

A. Follow the directions to test how sound travels through solids.

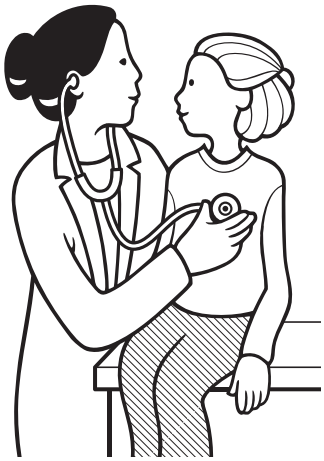
1. Tap on your desk with your fingers. Is it loud or soft? Write a sentence to describe the sound.

_____

2. Put your ear against the desk and tap again. What did you notice? Write a sentence to describe it.

_____

B. Doctors use a tool called a stethoscope to listen to your heartbeat. Look at the picture. Describe how you think a stethoscope works.



_____

_____

_____

Name _____

Daily Science

Big Idea 5

WEEK 3

Day 5

Weekly Question

Does sound travel underwater?

A. Circle the word that completes each sentence.

1. Sound waves in the air reflect off water's _____.

   bubbles waves surface

2. Air, water, and metal all have _____ that help sound travel.

   speeds bubbles molecules

3. Our ears hear sound best when it travels through _____.

   air solids liquids

B. Use words from the box to complete the paragraph.

molecules sound waves liquids

If you met an alien in space, could you say hello? Sound waves can travel through solids, _____, and gases. These things all have _____. But _____ cannot travel through space because there are no molecules in space. So you couldn't say hello, but you could still smile and wave!

Sounds are made by vibrating objects.

Week 4

How do animals without ears hear?

While some insects and worms have very basic "ears" that pick up vibrations, many animals have a well-developed sense of hearing, sometimes much better than our own. Animals with developed ears, including humans, have tiny bones that vibrate when exposed to sound waves. The brain converts these vibrations into sounds we recognize. In this week's lesson, students will learn how the human ear functions, as well as how other animals' ears function. They will learn that animals hear sounds from the air, from the water, and even from the ground.

Day One

Vocabulary: *inner ear, middle ear, outer ear*

Help students recall that sounds are vibrations made from sound waves. Distribute page 147 and introduce the vocabulary. Then have volunteers read the introduction aloud. Guide students through the diagram on the page before they complete the activities independently. Go over the answers together.

Day Two

Distribute page 148 and have volunteers read the introduction aloud. Have students complete activities A and B independently. For activity C, you may want to brainstorm answers as a group before students write their responses.

Day Three

Vocabulary: *detect*

Distribute page 149 and introduce the vocabulary word before having volunteers read the introduction aloud. Then say: **Not all animals need an outer ear or a middle ear to hear. So what is the most important part of the ear?** (the inner ear) Guide students through the activities and go over the answers together.

Day Four

Ask: **What kind of ears do you think animals that live in water have?** Distribute page 150 and have volunteers read the introduction aloud. Say: **Because sound waves travel through air and water, the ears of water animals act a lot like the ears of animals that live on land.** Have students complete the activities, and assist as needed. For activity B, you may need to remind students that whales, like dolphins, live in the water but breathe air.

Day Five

Tell students they will review everything they have learned about how animals hear. Have students complete page 151. Then go over the answers together.

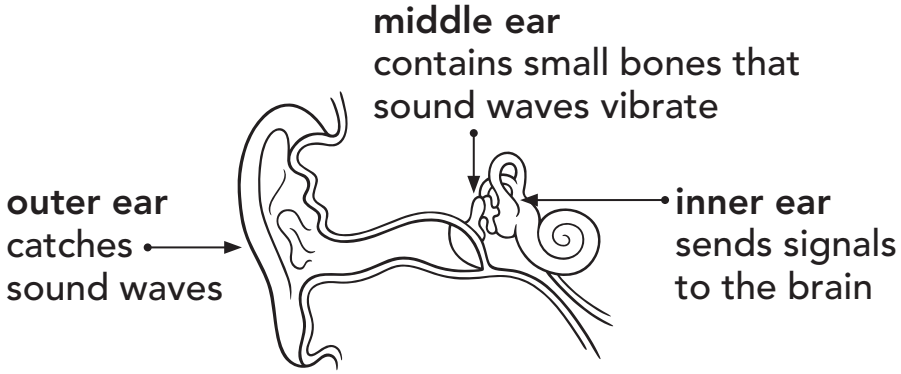
Name _____

Daily Science
Big Idea 5
WEEK 4

Weekly Question

Day 1 How do animals without ears hear?

Our ears are amazing. When sound vibrations reach our ears, special parts of the ear turn those vibrations into sounds we understand. Our ears are made of the **outer ear**, **middle ear**, and **inner ear**. Each part of our ear has a special job to help us hear sounds.



A. Write a word to complete each sentence.

1. Sound waves reach our _____ ear first.
2. The _____ ear connects the other parts of our ear.
3. The _____ ear sends signals to the brain.

B. Our outer ears focus sound. Circle the picture that shows something that works like our outer ear does.



Vocabulary

outer ear
the skin around the outside of our ear

middle ear
the part of our ear that connects the outer ear and inner ear

inner ear
the part of our ear that sends signals to the brain

Name _____

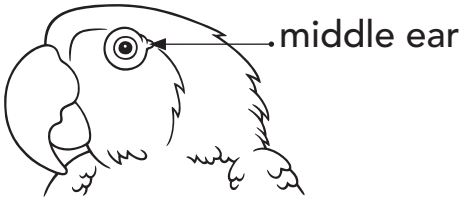
Daily Science
Big Idea 5
WEEK 4

Day 2

Weekly Question

How do animals without ears hear?

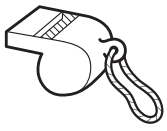
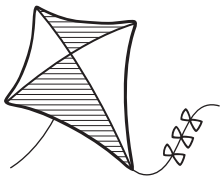
Birds sing, chickens cluck, and parrots squawk. Animals make a lot of noise! Almost every animal has a body part that hears, too. But not all animals' ears are like ours. For example, birds don't have outer ears. And their middle ears are covered by smooth feathers.



A. Read each sentence. Circle **true** or **false**.

1. Birds make sounds, but they can't hear. true false
2. Animals don't need outer ears to hear. true false

B. Special feathers on a bird's head protect its middle ear and block out the wind. Circle the picture that shows something that works like a bird's feathers.


C. Dogs and cats can turn their outer ears left and right. How might this help them hear better? Write your guess.

_____

_____

Name _____

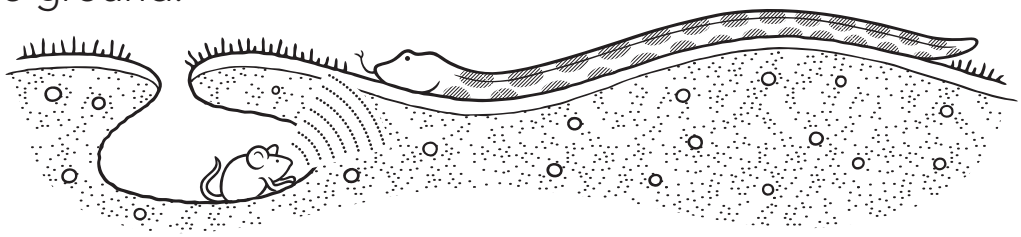
Daily Science
Big Idea 5
WEEK 4

Day 3

Weekly Question

How do animals without ears hear?

Snakes don't have outer ears. They don't have middle ears, either. But they have inner ears. And their inner ears are connected to their jawbones! This allows snakes to **detect** sounds from the air and feel vibrations from the ground.



Vocabulary

detect
to find by using one of the senses

A. Look at the picture above. Why might a snake want to detect vibrations in the ground? Check the correct box.

- ❒ A snake uses its ears to find a good place to rest.
- ❒ A snake uses its ears to find its food.

B. Look at the picture again. Why do you think a snake's ears are connected to its jawbone and not to the top of its head? Check the correct box.

- ❒ A snake's jaw touches the ground, but the top of its head does not.
- ❒ A snake's head is covered in scales that keep the snake from hearing.

C. What is a sound you detect with your ears when you are at school? Write a sentence about it.

_____

Name _____

Daily Science
Big Idea 5
WEEK 4

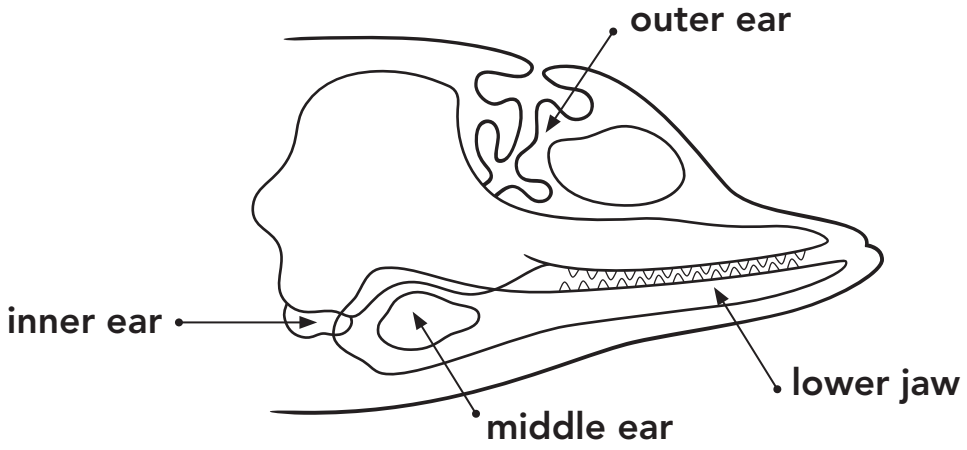
Day 4

Weekly Question

How do animals without ears hear?

Like all mammals, dolphins have middle and inner ears. Dolphins have small outer ears, but they are not connected to the middle ear. Sound vibrations in the water reach a dolphin's inner ear through its jawbone, the same as a snake! Scientists know that dolphins can detect sound vibrations in the water. But they don't know if dolphins hear very well in the air.

A. Look at the diagram of a dolphin. Draw an arrow to show how sound gets to the dolphin's inner ear.



B. Dolphins can hear sounds in water because they live mostly in water. What kind of matter do you think each animal below can hear sound through? Write **air**, **water**, or **ground**.

fish _____

cat _____

worm _____

Name _____

Daily Science
Big Idea 5
WEEK 4

Day 5

Weekly Question

How do animals without ears hear?

A. Circle the word that completes each sentence.

1. The _____ ear catches sound.

inner middle outer

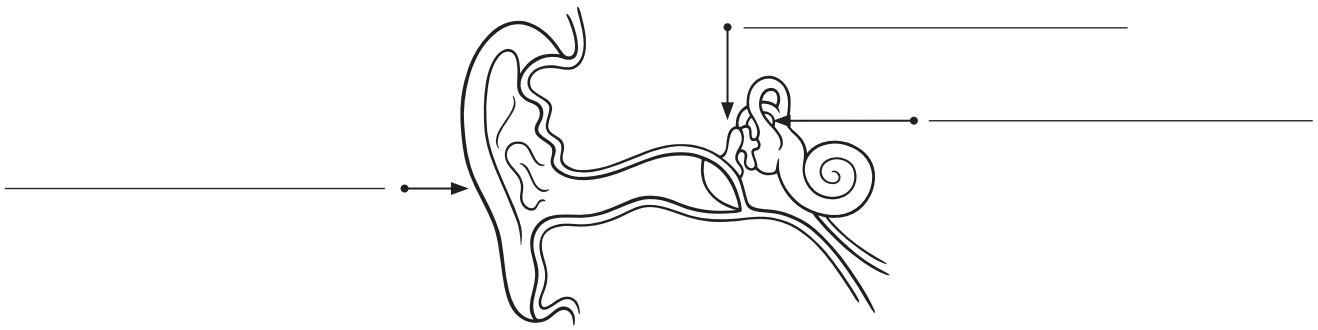
2. Birds, snakes, and humans all have _____ ears.

middle outer inner

3. If an animal detects a sound, it _____ that sound.

makes misses hears

B. Look at the diagram below. Label the parts of the ear.



C. What part of the ear must an animal have in order to hear sound? Write a complete sentence.

_____

Name _____

Daily Science
Big Idea 5
WEEK 5

Unit Review

Comprehension

Sound and Vibrations

Read each question. Fill in the bubble next to the correct answer.

1. Which of these does NOT make a vibration?
- Ⓐ a pencil lying on a desk
- Ⓑ a drum being hit
- Ⓒ a radio that is playing

2. To make an echo, a sound must bounce off a surface that is hard and ____.
- Ⓐ shiny
- Ⓑ smooth
- Ⓒ cold

3. The bones that vibrate in the ear are found in the ____.
- Ⓐ inner ear
- Ⓑ outer ear
- Ⓒ middle ear

4. What does sound travel fastest through?
- Ⓐ a solid
- Ⓑ a liquid
- Ⓒ a gas

5. Which of these sounds has the lowest pitch?
- Ⓐ a mouse's squeak
- Ⓑ a cricket's chirp
- Ⓒ a dog's growl

Name _____

Unit Review

Vocabulary

Match the Meanings

Write the letter of the correct definition next to each word.

_____	**1.** pitch	**a.** energy we can hear
_____	**2.** sound	**b.** contains small bones that sound waves vibrate
_____	**3.** detect	**c.** ripples of energy
_____	**4.** volume	**d.** how high or low a sound is
_____	**5.** middle ear	**e.** how loud or soft a sound is
_____	**6.** echo	**f.** a tiny piece of matter that is too small to see
_____	**7.** vibrations	**g.** to find by using one of the senses
_____	**8.** molecule	**h.** the part of the ear that sends signals to the brain
_____	**9.** outer ear	**i.** to bounce off a surface
_____	**10.** reflect	**j.** the part of the ear that you can see
_____	**11.** waves	**k.** very fast movements back and forth
_____	**12.** inner ear	**l.** sound waves that we can hear when they bounce back to us

Name _____

Daily Science
Big Idea 5
WEEK 5

Unit Review

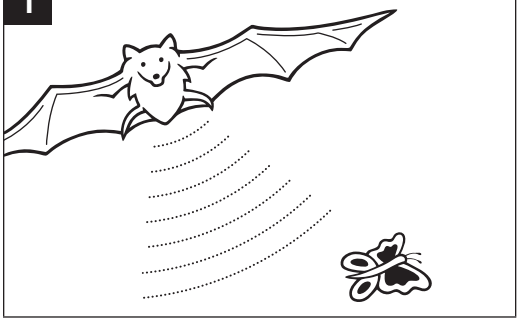
Visual Literacy

How Bats Use Echolocation

The pictures below show how a bat uses sound waves to catch an insect. Look at each picture. Then read the captions. Write the letter of the caption underneath the picture it describes.

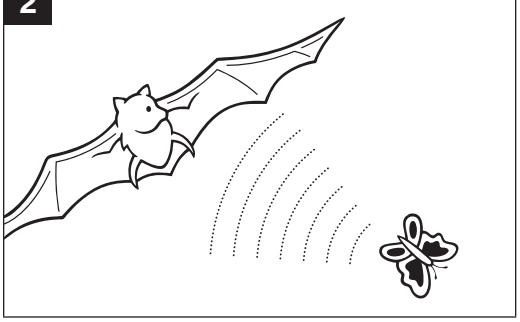
How a Bat Finds Food

1



_____

2

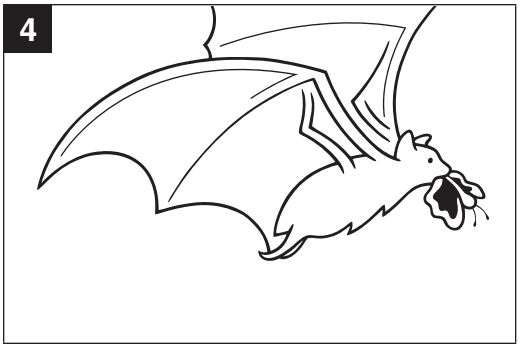


_____

3

_____

4



_____

a. The sound waves reflect off the bug.

b. The bat chases the bug.

c. The bat sends out sound waves.

d. The bat eats the bug.

Name _____

Daily Science Big Idea 5 WEEK 5

Unit Review

Hands-on Activity

Make Your Own Phone!

All phones send and receive sound. Most phones use electricity and special parts to do this. But you can make a phone from two cups and string. Just follow these steps!

What You Need

- a partner
- two plastic cups
- 10 to 12 feet of kite string or fishing line

1. Have your teacher help you poke a small hole in the bottom of each cup.
2. Push one end of the string through one hole from the bottom of the cup. Push the other end through the other cup.
3. Tie knots in the ends of the string inside the cups so that the string doesn't slip through the holes when you pull it tight.
4. Give your partner one of the cups. Take the other cup and move away until the string is tight.
5. Take turns talking into one of the cups while the other person holds the cup to his or her ear.

What Did You Discover?

1. What happened when you put the cup to your ear and your partner talked?

_____

2. Put your finger on the string. Now talk. What happens?

_____

3. How do you think the sound travels between the cups?

_____

Magnets make some things move without touching them. They also attract or repel other magnets.

Key Concepts
Magnets, Attraction, and Repulsion

National Standard
Magnets attract and repel each other and certain kinds of other material.

Students may have some familiarity with common magnets, such as those found on refrigerators, but they may not understand how magnets work or that we are actually living on a giant magnet—Earth. This Big Idea teaches students that:

- magnets attract objects made of iron or steel;
- magnets have two poles;
- magnets have magnetic fields; and
- compasses are magnets that point north.

Teacher Background

All magnets have magnetic fields. A magnetic field will attract certain metals, usually those containing iron, and attract or repel other magnets. The strength of a magnet is determined by the size of its magnetic field. Strong magnets have larger magnetic fields than those of weaker magnets.

All magnets have a north and a south pole. The same poles in two magnets will repel each other, but opposite poles will attract. Earth also has magnetic poles, as well as a weak magnetic field. It is because of Earth's magnetic poles that we can use compasses to navigate. A compass's needle is actually a magnet that moves to line up with Earth's magnetic field, so it points north.

A magnet can be either permanent or temporary. Permanent magnets always have a magnetic field and poles, while temporary magnets lose their fields and poles. The most common, and strongest, type of temporary magnet is an electromagnet, which uses electricity to create a magnetic field.

Magnets have many practical applications, from can openers to clasps in handbags to trains that are propelled along magnetic tracks.

For specific background information on each week's concepts, refer to the notes on pp. 158, 164, 170, and 176.

Unit Overview

WEEK 1: Why does a magnet stick to a refrigerator?

Connection to the Big Idea: Students learn that magnets attract some kinds of metal.

Students are introduced to the concept of magnetism and learn that magnets only attract objects made of iron or steel, and that the attraction is strong enough to go through paper or other thin material.

Content Vocabulary: *attract, iron, magnet, magnetic, magnetism*

WEEK 2: How can magnets move things without touching them?

Connection to the Big Idea: Students learn how a magnet's magnetic field pulls objects toward it.

Students first learn that all magnets have a magnetic field and a north and south pole. They then learn how the poles attract and repel each other.

Content Vocabulary: *magnetic field, poles, repel*

WEEK 3: Why are some magnets stronger than others?

Connection to the Big Idea: Students learn about strong, weak, permanent, and temporary magnetic fields.

Students learn that magnets have fields of varying strength and that the strength has nothing to do with the magnet's size. Students then discover that some magnets are permanent, while others lose their fields.

Content Vocabulary: *electromagnet, permanent magnet, temporary magnet*

WEEK 4: How does a compass work?

Connection to the Big Idea: Students learn that a compass uses a magnet to find Earth's magnetic north.

Students begin by learning that Earth is a giant magnet with an iron core, a magnetic field, and magnetic poles. They then discover that the needle of a compass is a magnet that is attracted to Earth's magnetic north. Finally, students consider that some migratory animals are believed to have internal "magnets" that help them navigate.

Content Vocabulary: *compass, core, direction*

WEEK 5: Unit Review

You may choose to do these activities to review concepts about magnets.

p. 182: Comprehension Students answer multiple-choice questions about key concepts in the unit.

p. 183: Vocabulary Students match vocabulary words from the unit to their definitions.

p. 184: Visual Literacy Students first determine objects that an electromagnet would pick up and then study magnets to determine which would attract or repel each other based on the poles' positions.

p. 185: Hands-on Activity Students create a temporary magnet using a permanent magnet and an iron nail. Instructions and materials needed for the activity are listed on the student page.

Week 1

Why does a magnet stick to a refrigerator?

Magnets make some things move without touching them. They also attract or repel other magnets.

In this week's lesson, students learn that magnets stick to refrigerator doors because the doors are made of metal that contains iron. Magnets are only attracted to some metals, and iron and steel are the most common. They contain what scientists call a "magnetic domain." Other metals, such as copper and tin, as well as nonmetals, do not have magnetic domains. Some refrigerators, such as those made of stainless steel, do not hold magnets. These refrigerators contain nickel, a metal that interferes with iron's magnetic domain.

Day One

Vocabulary: *magnet*

Materials: one or more kinds of magnets such as those in activity A (optional)

Activate prior knowledge by asking students to describe a magnet and what it does. Distribute page 159, introduce the vocabulary word, and have volunteers read aloud the introduction. Point out the pictures of magnets and, if you have them, show students different kinds of magnets. Then have students complete the activities. For activity A, suggest that students look at each magnet's shape for clues to what it is called.

Day Two

Vocabulary: *attract, magnetic, magnetism*

Materials: magnet and the objects pictured in activity B (optional)

Distribute page 160 and introduce the vocabulary. Write **magnet, magnetic,** and **magnetism** on the board. Say: **These words are related. They all have the word *magnet* in them, and they are all words that tell about magnets.** Have volunteers read the introduction aloud before students complete the activities independently. For activity B, you may want to distribute a magnet and the objects pictured on the page so students can test whether the objects are attracted to magnets.

Day Three

Vocabulary: *iron*

Distribute page 161 and introduce the vocabulary word before having volunteers read the introduction aloud. Guide students through the chart and have them complete activities A and B. For activity C, either have students complete the activity independently, or brainstorm objects as a group and list them on the board for students to copy.

Day Four

Materials: magnet, metal baking pan, and sheets of paper

Distribute page 162 and have volunteers read the introduction aloud. Then demonstrate how a magnet can still attract metal even if a sheet of paper is between them. Add sheets until the magnet no longer sticks. Have students complete the activities. Then review the answers together.

Day Five

Tell students they will review everything they have learned about magnets. Have students complete page 163. Then go over the answers together.

Name _____

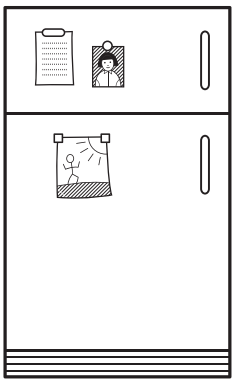
Daily Science
Big Idea 6
WEEK 1

Day 1

Weekly Question

Why does a magnet stick to a refrigerator?

How do the notes on this refrigerator stick to its door? They aren't glued on. They stick to the refrigerator because **magnets** hold them there. Magnets are also used to keep refrigerator doors shut. Magnets are very useful!

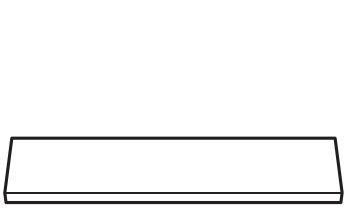


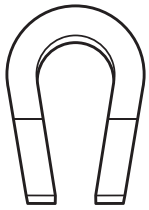
Vocabulary

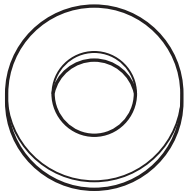
magnet
something that attracts metal and other magnetic things

A. Look at the different types of magnets. What do you think each one is called? Use the words in the box to label each magnet.

horseshoe ring bar







_____ _____ _____

B. What do you have on your refrigerator at home? Draw a picture of two things that you use magnets to hold up.

Name _____

Daily Science
Big Idea 6
WEEK 1

Day 2

Weekly Question

Why does a magnet stick to a refrigerator?

Magnets stick to objects made from some kinds of metals. Magnets use a force called **magnetism** to **attract** these metals. An object that attracts metal is called **magnetic**. A magnetic object will not attract glass, plastic, wood, or anything else that does not contain metal.

Vocabulary

attract
to pull together

magnetic
able to attract metal or able to act like a magnet

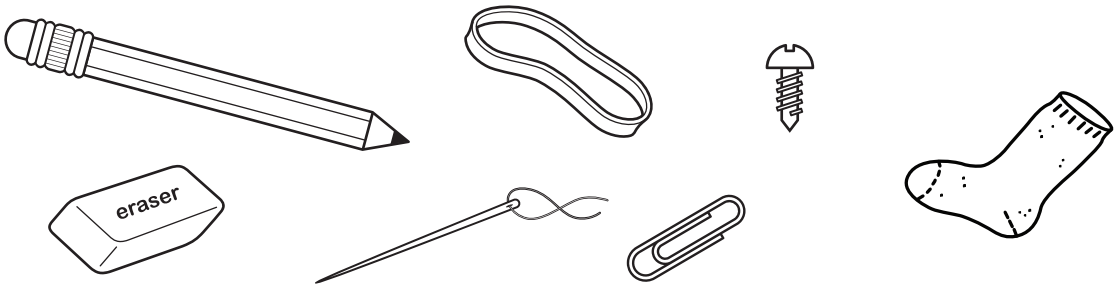
magnetism
a natural force between magnetic objects

A. Circle the word that completes the sentence.

Magnets attract some objects made of _____.

glass metal cloth rubber

B. Which of these would be attracted to something that was magnetic? Circle them.



C. What do the objects you circled have in common? Write a sentence to answer the question.

_____

Name _____

Daily Science
Big Idea 6
WEEK 1

Day 3

Weekly Question

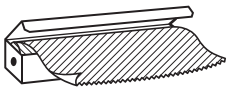
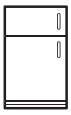
Why does a magnet stick to a refrigerator?

A magnet won't stick to everything made from metal. A magnet won't stick to coins or soda cans. These things do not have **iron** in them. Magnets only attract metals with iron in them. Steel is a metal with iron in it, so a magnet will attract something made from steel.

Vocabulary

iron
a metal that is magnetic

A. Fill in the missing parts of the chart.

Object	Does it have iron?	Will a magnet attract it?
paper clip 	yes	
foil 	no	
necklace 	no	
refrigerator 	yes	

B. Write the word that completes the sentence.

Metals will be attracted to a magnet if they have _____ in them.

C. List three things in your classroom that a magnet will stick to.

1. _____ **2.** _____ **3.** _____

Name _____

Daily Science

Big Idea 6

WEEK 1

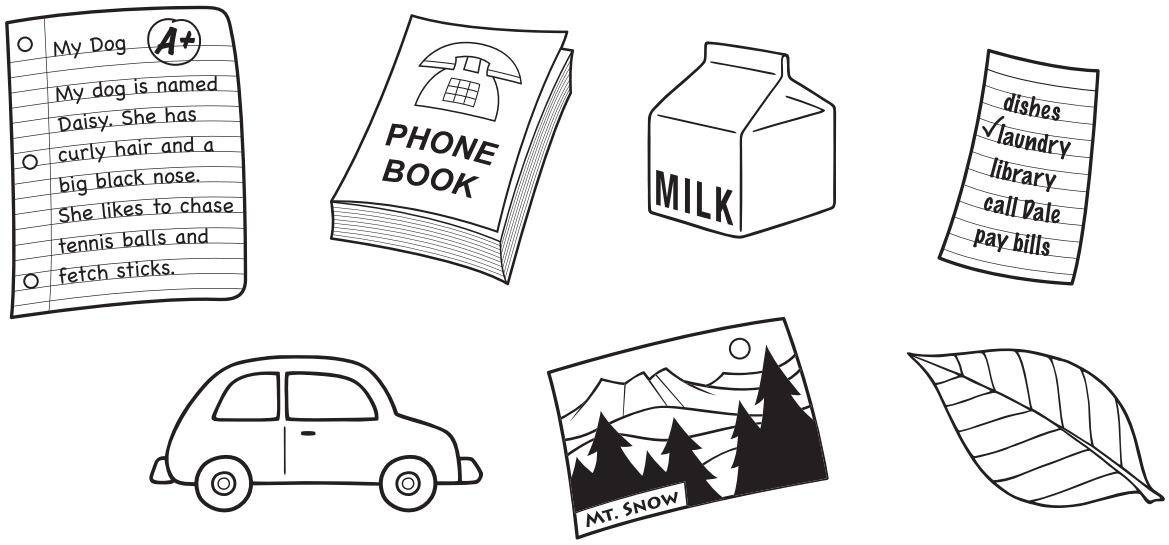
Day 4

Weekly Question

Why does a magnet stick to a refrigerator?

Most magnets will attract a metal object even if something thin is between the object and the magnet. You can hang a picture or your report card on the refrigerator and the magnet will hold it in place. But a refrigerator magnet won't hold up your favorite book or toy. The magnet isn't strong enough.

A. Circle the things that a refrigerator magnet could hold up.



B. Read each sentence. Write **true** or **false**.

1. A magnet can stick to a metal object only when there is nothing in between. _____

2. A refrigerator magnet can hold up anything. _____

3. A refrigerator magnet will hold up your painting if it is on thin paper. _____

Name _____

Daily Science
Big Idea 6
WEEK 1

Day 5

Weekly Question

Why does a magnet stick to a refrigerator?

A. Complete the paragraph. Use the words in the box.

magnet **magnetic** **magnetism**

A _____ is attracted to some metals. This attraction is called _____. If something acts like a magnet, we say it is _____.

B. Circle the word that completes each sentence.

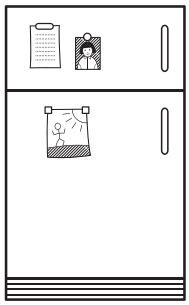
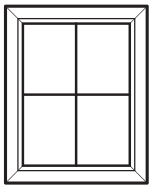
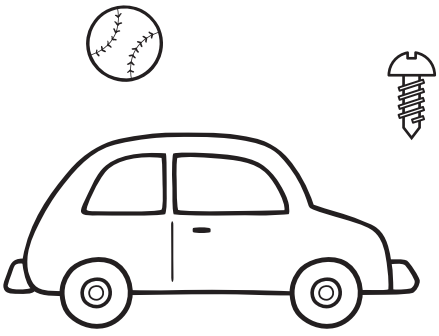
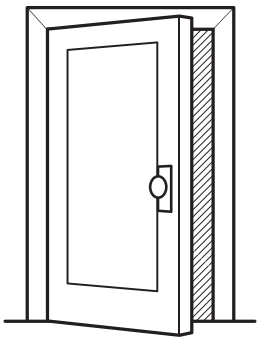
1. A magnet is attracted to metal that contains _____.

iron water sand

2. A magnet will stick to _____.

glass metal wood

C. Color the objects that a magnet will stick to or attract.

Week 2

How can magnets move things without touching them?

Magnets make some things move without touching them. They also attract or repel other magnets.

This week, students learn that all magnets have a magnetic field, which is the force that pulls objects within the field toward the magnet. All magnetic fields are strongest at the magnets' poles. For clarity, we often label the poles as "north" and "south," but these labels don't refer to which way the magnet is facing. They merely indicate opposite ends or sides. North and south poles will attract each other, while two north poles or two south poles will repel each other.

Day One

Vocabulary: *magnetic field*

Materials: magnet, paper clip

Show students how a paper clip will "jump" to a magnet when it gets close to it. Ask: **How do you think this happens?** Distribute page 165 and introduce the vocabulary word. Explain that we can't see a magnetic field, but we know it's there when a magnet attracts something. Have volunteers read the introduction aloud. Then have students complete the activities. Go over the answers together.

Day Two

Vocabulary: *poles*

Materials: magnet, iron filings (optional)

Distribute page 166 and introduce the vocabulary word. Have volunteers read the introduction aloud as you point out the pictures of the magnets. If you have them, scatter iron filings around a magnet to show students how the magnetic field is strongest at the poles. Have students complete the activities. Then review the answers together.

Day Three

Vocabulary: *repel*

Materials: two bar, ring, horseshoe, or rare-earth (disc) magnets

Distribute page 167 and introduce the vocabulary word before reading the introduction aloud. Then have volunteers take turns trying to put the like poles of two magnets together and describing what happens, using the new vocabulary word. Explain that two north poles or two south poles will always repel one another, while the opposite poles will attract. Have students complete the activity. Then review the answers together.

Day Four

Distribute page 168 and have volunteers read the introduction aloud. Then pair students for the activity, and help them brainstorm ideas for possible inventions. (e.g., a magnetic pet collar, magnets to keep shoelaces tied, a doorstop that uses repelling magnets to prevent the door from closing) After students have completed the activity, have them share their inventions with the rest of the class.

Day Five

Tell students they will review everything they have learned about magnetic fields. Have students complete page 169. Then review the answers together.

Name _____

Daily Science
Big Idea 6
WEEK 2

Day 1

Weekly Question

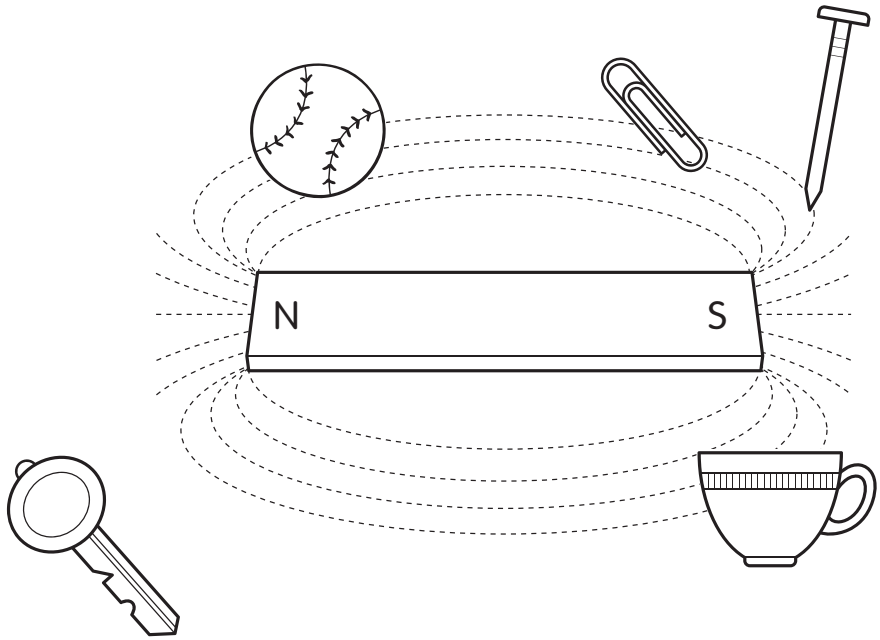
How can magnets move things without touching them?

All magnets have a **magnetic field**. The magnetic field will attract metal to the magnet. If something small and metal, such as a paper clip, is in a magnet's magnetic field, the paper clip will "jump" to the magnet.

Vocabulary

magnetic field
the area around a magnet that attracts magnetic objects

A. Trace the magnetic field. Then circle the things that will be pulled to the magnet by the field.



B. Complete the sentences. Use words from the paragraph above.

1. All magnets have a _____.
2. A magnetic field will _____ things made from metal.

Name _____

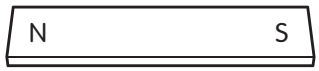
Daily Science
Big Idea 6
WEEK 2

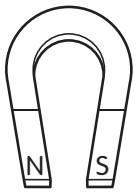
Day 2

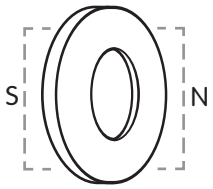
Weekly Question

How can magnets move things without touching them?

Magnets have two **poles**. They are the parts of a magnet where its force is the strongest. Every magnet, no matter what its shape, has two poles: a north pole and a south pole.







Vocabulary

poles
the parts of a magnet where the force is the strongest

A. Look at the pictures above. Then answer the questions.

1. How many poles does every magnet have? _____
2. Which part of the magnet is stronger, the poles or the middle? _____
3. If you wanted to pick up something with a magnet, which part of the magnet would you use? Why?

_____

B. Read each sentence. Circle **true** or **false**.

1. Only straight magnets have a north and a south pole. true false
2. A horseshoe magnet is strongest at its ends. true false
3. A magnet can have a south pole without a north pole. true false

Name _____

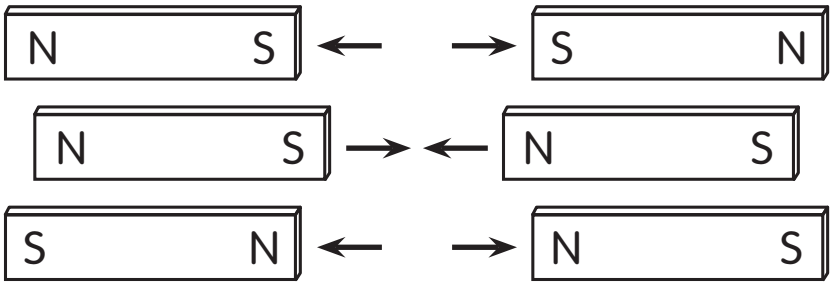
Daily Science
Big Idea 6
WEEK 2

Day 3

Weekly Question

How can magnets move things without touching them?

When two magnets are put together, the north and south poles attract each other. They pull together. But poles of the same kind **repel** each other. The north poles of each magnet push away from each other, and the south poles of each magnet push away from each other.



Vocabulary

repel
to push away

Answer each riddle. Write **north** or **south**.

1. I am attracted to the north pole of another magnet.

   I am a magnet's _____ pole.

2. I am repelled by the north pole of another magnet.

   I am a magnet's _____ pole.

3. I am attracted to the south pole of another magnet.

   I am a magnet's _____ pole.

4. I am repelled by the south pole of another magnet.

   I am a magnet's _____ pole.

Name _____

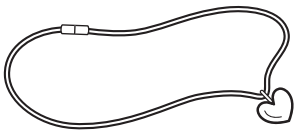
Daily Science
Big Idea 6
WEEK 2

Day 4

Weekly Question

How can magnets move things without touching them?

A magnet's magnetic field can be used for lots of things. Some bracelets have magnets instead of clasps to keep the ends closed. An electric can opener has a magnet that attaches to a can's top when the can turns around.



Magnets are even used in some trains to make the trains move very fast. The train rides on a cushion of air while the magnets push it down the track.

Work with a partner to make your own invention that uses magnets. Draw it below and tell how it works.

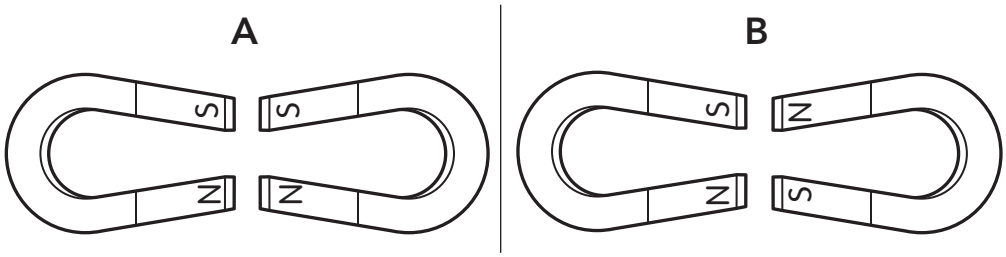
Name _____

Daily Science
Big Idea 6
WEEK 2

Weekly Question

Day 5 How can magnets move things without touching them?

A. Write the letter of the picture that answers each question.



1. Which picture shows magnets that will pull together? _____

2. Which picture shows magnets that will push apart? _____

B. Write the word that completes each sentence.

1. Two north poles will _____ each other.

2. A north and a south _____ will attract each other.

C. Draw a magnetic field around this magnet. Draw two arrows to show where its field is the strongest. Then draw something sticking to the magnet.

Week 3

Why are some magnets stronger than others?

Magnets make some things move without touching them. They also attract or repel other magnets.

As students have learned, the space around a magnet where its magnetic force is felt is called the magnetic field. This week, students will learn about strong and weak magnetic fields and how magnets can be permanent, temporary, or electromagnetic. Electromagnets produce the strongest magnetic fields. They become magnetic when an electric current runs through them. The strongest permanent magnets are made of a mixture of neodymium, boron, and iron. They are magnetized by having a magnetic field applied to them by an electromagnet. Common permanent magnets are made with other alloys. Differences between the metal alloys affect how strong a magnetic field can be and how long it will last.

Day One

Materials: magnets of various sizes, including some small, strong magnets

Ask: **Do you think big magnets are stronger than small magnets?** Tally the answers on the board. Allow students to examine the magnets you brought in to see if larger magnets are always stronger. Distribute page 171. Have volunteers read the introduction aloud before students complete the activities. Then return to the original question and poll students again. Ask: **What makes a magnet strong?** (a strong magnetic field)

Day Two

Vocabulary: *permanent magnet, temporary magnet*

Distribute page 172 and develop the vocabulary by discussing things that are **permanent** or **temporary**. (permanent teeth versus baby teeth, permanent markers versus washable markers, etc.) Then have volunteers read the introduction aloud. Guide students through the pictures on the page that show how to make a temporary magnet, and read the caption choices below each picture. Have students check the correct caption.

Day Three

Vocabulary: *electromagnet*

Materials: piece of metal and wire or string (optional)

Distribute page 173 and introduce the vocabulary word. If you have the materials, wrap the wire or string around the metal to help students visualize an electromagnet. Say: **A simple electromagnet is iron or steel wrapped with wires. When electricity runs through the wires, it creates a magnetic field.** Read the introduction aloud and have students complete the activities. When they have finished, ask volunteers to read the completed passage for activity B.

Day Four

Distribute page 174 and have volunteers read the introduction aloud. Then have students complete the activities. Invite volunteers to share their sentences.

Day Five

Tell students they will review everything they have learned about permanent and temporary magnets. Have students complete page 175. Then review the answers together.

Name _____

Daily Science
Big Idea 6
WEEK 3

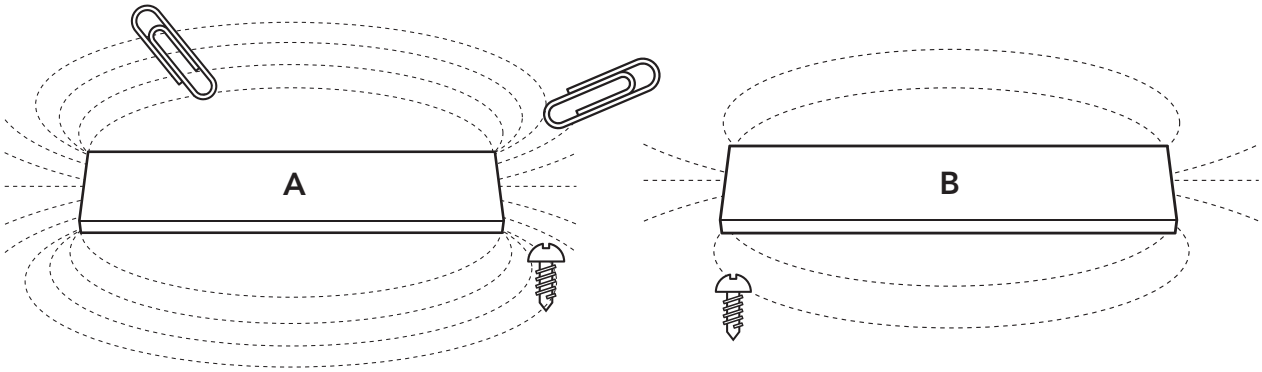
Day 1

Weekly Question

Why are some magnets stronger than others?

The strength of a magnet has to do with the size of its magnetic field, not the size of the magnet. A strong magnetic field will attract things that are farther away than a weak magnetic field will.

A. Look at the picture. Trace the magnetic fields. Circle the objects inside the magnetic fields. Draw a line to the magnet that each object will be attracted to.



B. Look at the picture again. Then read each question. Circle the correct letter.

1. Which magnet has the bigger magnetic field? A B
2. Which magnet will attract more objects? A B
3. Which magnet is the strongest? A B

Name _____

Daily Science
Big Idea 6
WEEK 3

Day 2

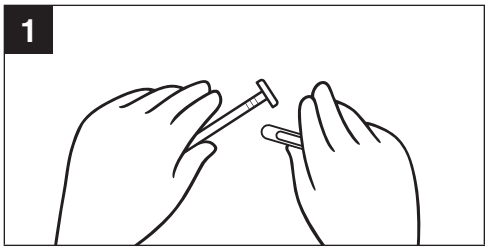
Weekly Question

Why are some magnets stronger than others?

Some magnets are **permanent magnets**. A permanent magnet will always stay a magnet. Some magnets are **temporary magnets**. They become magnetic for a short time, but then their magnetic fields go away.

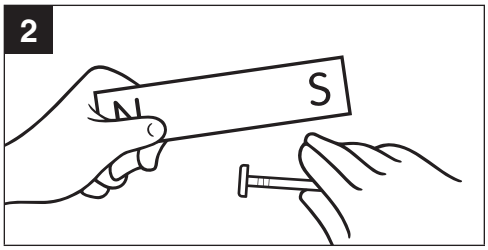
The pictures below show how to turn a nail into a temporary magnet. Read the captions below each picture. Put a check next to the correct caption for the picture.

1



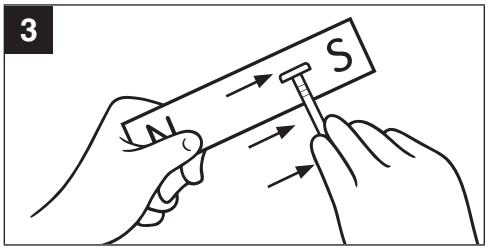
- ❒ Hold a paper clip close to the nail.
- ❒ Hold a piece of paper close to the nail.

2



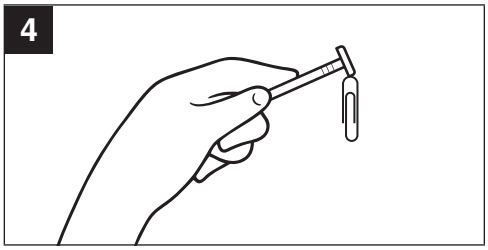
- ❒ Get a stick and a magnet.
- ❒ Get a nail and a magnet.

3



- ❒ Rub the nail up and down on the magnet.
- ❒ Rub the nail across the magnet many times, in one direction.

4



- ❒ Hold up the paper clip with the nail.
- ❒ Use the paper clip to hold up the nail.

Vocabulary

permanent magnet
a magnet that keeps its magnetic field

temporary magnet
a magnet that will lose its magnetic field

Name _____

Daily Science
Big Idea 6
WEEK 3

Day 3

Weekly Question

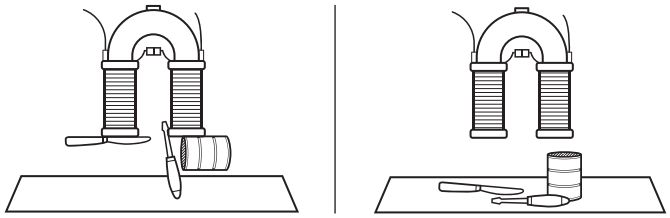
Why are some magnets stronger than others?

One kind of temporary magnet can be very strong. It is an **electromagnet**. An electromagnet is a magnet made by using electricity. Electricity runs through the electromagnet, which gives it a strong magnetic field. When the electricity is off, the electromagnet does not have a magnetic field.

Vocabulary

electromagnet
a strong temporary magnet made by electricity

A. Circle the electromagnet that is turned on. Then complete the sentence that tells how you know.



I know the electromagnet is turned on because the objects are _____.

B. Complete the sentences. Use the words in the box.

electromagnet	magnetic field	temporary

An _____ is a magnet that uses electricity. It is a kind of _____ magnet. When an electromagnet has electricity flowing through it, its _____ is very strong.

Name _____

Daily Science
Big Idea 6
WEEK 3

Day 4

Weekly Question

Why are some magnets stronger than others?

The strongest magnet in the universe is a kind of star. It is billions of times stronger than any magnet on Earth. The strongest magnet on Earth is an electromagnet. It is in Germany. Scientists use it to do experiments. They want to learn more about how magnetism works.

A. Circle the words that complete the sentences.

1. The strongest magnet anywhere is _____.

   a star a special metal an electromagnet

2. Scientists use magnets to study _____.

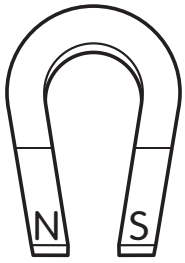
   stars magnetism books

B. Draw something for this strong magnet to hold up. Then write a sentence about it.

_____

_____

_____



Name _____

Daily Science
Big Idea 6
WEEK 3

Day 5

Weekly Question

Why are some magnets stronger than others?

A. Complete the sentences. Use the words in the box.

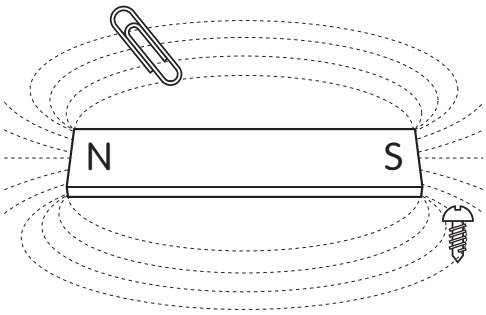
electromagnet **permanent** **temporary**

1. A _____ magnet never loses its magnetic field.

2. Electricity helps the _____ make its magnetic field.

3. You can use a permanent magnet to make a _____ magnet.

B. Write **strong** under the stronger magnet and **weak** under the weaker magnet.



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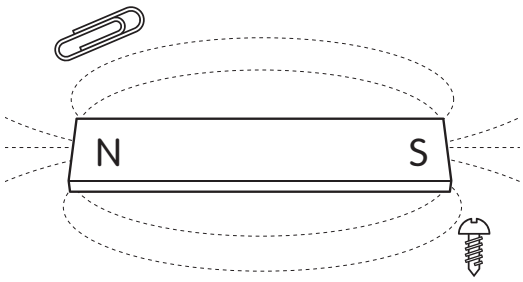


_____

C. What happens to the magnetic field of a temporary magnet?

_____

Week 4

How does a compass work?

Magnets make some things move without touching them. They also attract or repel other magnets.

Earth's outer core is made of molten iron, which causes it to be like a giant magnet. Earth's north and south magnetic poles are the poles of this giant magnet. However, Earth has a magnetic field that is very weak because its magnetic core is so far away from the surface. Also, the magnetic north pole and geographic North Pole are not the same. The magnetic north pole drifts because of fluctuations in the Earth's inner core, which changes the magnetic field slightly. Therefore, this week's lesson avoids mentioning Earth's magnetic poles and the geographic poles together to avoid confusing students.

Day One

Vocabulary: *core*

Materials: apple and small knife (optional)

Distribute page 177 and introduce the vocabulary word. To reinforce its meaning, brainstorm with students things that have cores. If you have brought in an apple, cut it to show students that the core is in the middle. Have volunteers read the introduction aloud. Point to the picture on the page and say: **Earth's core is made of iron. Remember that iron can become a magnet. The iron in Earth's core is magnetic.** Guide students through activities A and B, reminding them of the properties of magnets.

Day Two

Vocabulary: *compass, direction*

Materials: compass (optional)

Distribute page 178 and introduce the vocabulary. Review the four main directions: north, south, east, and west. Then have volunteers read the introduction aloud. Show students the compass you brought or direct them to the picture on the page and point out the parts. Have students complete activity A. For activity B, brainstorm as a group how people get directions today. (GPS, computers, maps, etc.)

Day Three

Materials: compass

Distribute page 179 and have volunteers read the introduction aloud. Demonstrate facing different directions in the classroom and show students how the needle in the compass moves. Have volunteers help you figure out where east, south, and west are. Then have students complete activities A and B. For the oral activity, say: **Remember, the needle of a compass is a magnet. What are magnets attracted to?** (metals and other magnets) **So, where might the needle point if it was next to another magnet?** (the other magnet instead of Earth's magnetic pole)

Day Four

Distribute page 180 and have volunteers read the introduction aloud. Invite students to share what they know about animal migration. Then have students complete the activities. Go over the answers together.

Day Five

Tell students they will review everything they have learned about compasses. Have them complete page 181. Review the answers together.

Name _____

Daily Science
Big Idea 6
WEEK 4

Day 1

Weekly Question

How does a compass work?

Did you know that Earth is a giant magnet? It has two magnetic poles and a magnetic field. The part of Earth that is magnetic is its **core**. The core is made of two layers, the inner core and the outer core. They are both made of iron that has become magnetic.

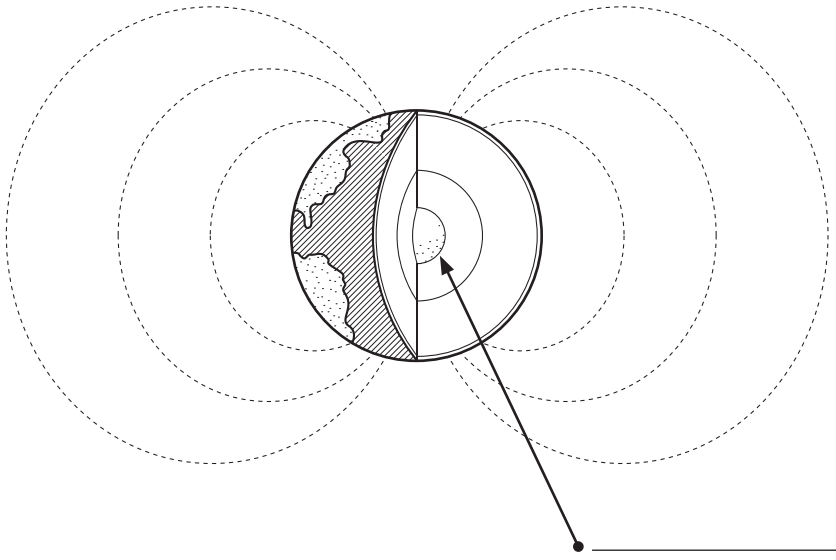
Vocabulary

core
the middle part of something

A. Mark an **X** next to the things that Earth has because it is a magnet.

___ magnetic field
___ wind
___ sunlight
___ two poles
___ salt water
___ lots of trees

B. Trace Earth's magnetic field. Then write the name of the part of Earth that is magnetic.



_____

Name _____

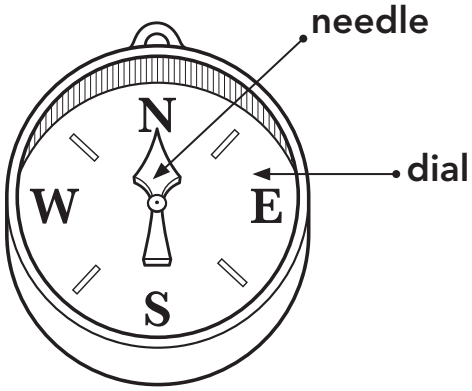
Daily Science
Big Idea 6
WEEK 4

Day 2

Weekly Question

How does a compass work?

A **compass** is a tool that helps us find our **direction**, or which way we are moving. A compass always points north. If you have a compass, you can use it to find north. Then you can tell which way south, east, and west are, too.



Vocabulary

compass
a tool that uses a magnet to point north

direction
the way that something is moving or pointing

A. Look at the picture above. Answer the questions.

1. What is the pointing part of the compass called? _____
2. What direction does a compass always point to? _____
3. What is the part of the compass with the letters on it called? _____

B. A long time ago, a compass was the only tool that people had for finding directions. Today, what are some other ways people get directions?

_____

Name _____

Daily Science
Big Idea 6
WEEK 4

Day 3

Weekly Question

How does a compass work?

The needle of a compass is a magnet. This magnet is attracted to Earth's magnetic field. It always points north. No matter how you turn the compass, the needle will swing around so that it is still pointing north.

A. Look at each compass. Write **north** to show where north is. Then write the names of the other directions: **east**, **south**, and **west**.

B. Read each sentence. Circle **true** or **false**.

1. A compass needle always points north. **true** **false**
2. A compass ring is magnetic. **true** **false**
3. A compass would still work if Earth was not a magnet. **true** **false**

Talk

Since a compass uses Earth's magnetism to find north, what might happen if your compass was near a very strong magnet? Talk about it with a partner.

Name _____

Daily Science
Big Idea 6
WEEK 4

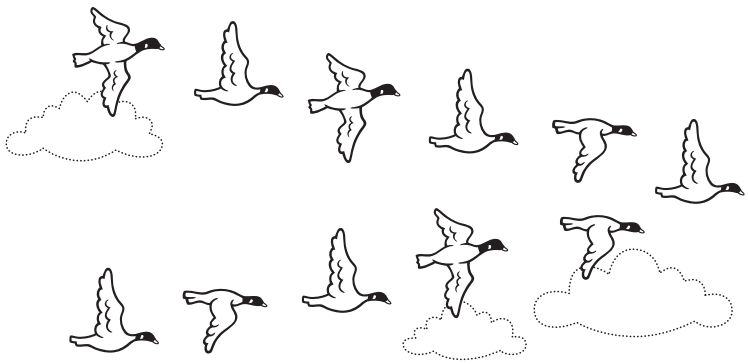
Day 4

Weekly Question

How does a compass work?

Did you know that some animals can find directions by using Earth's magnetic field? Many birds, such as geese, travel south in the fall and north in the spring. They have special body parts that sense Earth's magnetic field. They know which way to go, almost as if they were using a compass!

A. Look at the picture below. Which way is north? Draw an arrow to show the direction and label it **north**.



B. Read each sentence. Write **true** or **false**.

1. Some animals can sense Earth's magnetic field. _____
2. Birds use Earth's magnetic field to help them fly through the air. _____
3. Without Earth's magnetic field, birds might not know where to fly during the fall. _____

Name _____

Daily Science
Big Idea 6
WEEK 4

Day 5

Weekly Question

How does a compass work?

A. Complete the sentences. Use the words in the box.

compass **core** **directions** **needle**

1. North, south, east, and west are the four main _____.

2. A _____ is a tool that shows you which way you are facing.

3. The _____ is the part of a compass that is a magnet.

4. The part of Earth that is a magnet is its _____.

B. Draw a compass in the box. Label the **needle** and the **dial**. Write **N**, **S**, **E**, and **W** on the dial to show the four directions.

Name _____

Unit Review

Comprehension

Magnets

Daily Science Big Idea 6 WEEK 5

Read each question. Fill in the bubble next to the correct answer.

1. Which of these would NOT be attracted to a magnet?

Ⓐ a steel door
Ⓑ an iron nail
Ⓒ another magnet
Ⓓ a piece of wood

2. Magnets have _____ poles.

Ⓐ one
Ⓑ two
Ⓒ three
Ⓓ four

3. The space around a magnet where its magnetic force can be felt is called a magnetic _____.

Ⓐ field
Ⓑ compass
Ⓒ attraction
Ⓓ core

4. In which direction does a compass needle point?

Ⓐ east
Ⓑ west
Ⓒ north
Ⓓ south

5. What gives an electromagnet its magnetic field?

Ⓐ electricity
Ⓑ Earth
Ⓒ metal
Ⓓ poles

Name _____

Unit Review

Vocabulary

Match the Meanings

Daily Science Big Idea 6 WEEK 5

Match each word on the left to its definition on the right.

magnet •	• to pull closer
attract •	• something that attracts metals and other magnets
repel •	• a natural force between magnetic objects
magnetism •	• the area around a magnet that attracts magnetic objects
needle •	• the part of a compass that points north
permanent magnet •	• the strongest parts of a magnet
poles •	• a magnet that always keeps magnetic field
compass •	• to push two things apart
magnetic field •	• a strong temporary magnet made with electricity
temporary magnet •	• a tool that shows where north is
electromagnet •	• a magnet that loses its magnetic field

Name _____

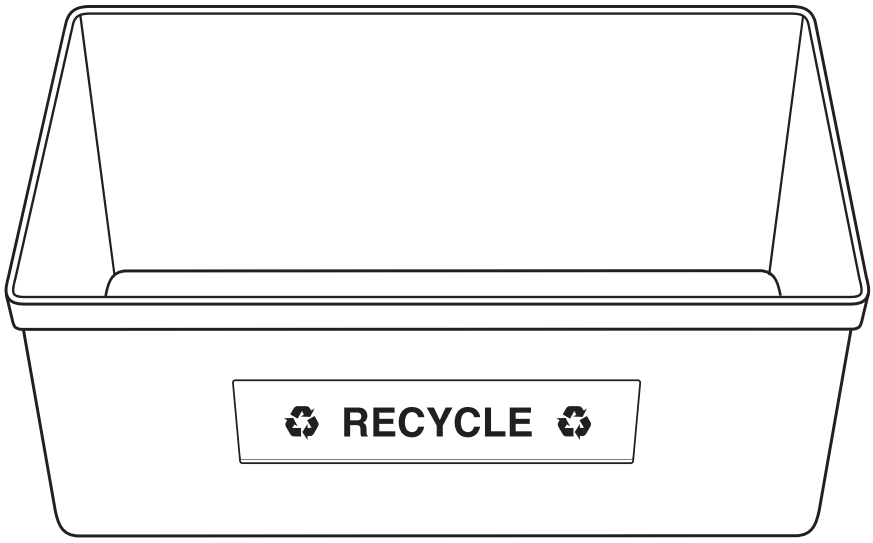
Daily Science
Big Idea 6
WEEK 5

Unit Review

Visual Literacy

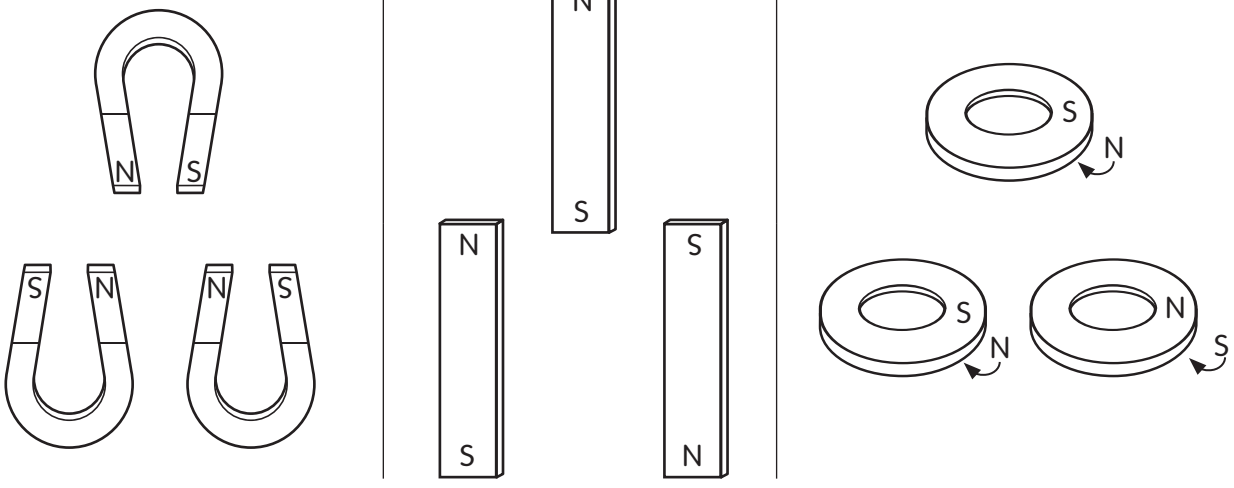
Sorting with Magnets

A. An electromagnet can be used to sort trash. Draw four things in the bin that an electromagnet would pick up. List them next to the bin.



1. _____
2. _____
3. _____
4. _____

B. Look at each set of magnets. Draw a line from the top magnet in each set to the one it would attract. Cross out the one it would repel.



Name _____

Daily Science
Big Idea 6
WEEK 5

Unit Review

Hands-on Activity

Make a Magnet

You can use a permanent magnet to turn a nail into a temporary magnet.

What You Need

- a permanent magnet
- an iron nail
- metal paper clips

1. Hold the magnet it one hand and the nail in the other.
2. Rub the nail along the magnet from the top to the bottom. Do this 50 times, always in the same direction.
3. Try to pick up paper clips with the nail.
4. If the nail won't pick up any paper clips, rub it several more times along the magnet.

What Did You Discover?

1. How many times did you rub the nail? _____
2. How many paper clips could the nail hold at once? _____
3. What kind of magnet did the nail become? _____
4. Did the nail have a strong or a weak magnetic field?

_____

Answer Key

***Big Idea 1:* Week 1 • Day 1**

A. 1. life cycle
2. reproduce
3. adult

B. adults

TALK: The life cycles are similar because both animals grow from babies to adults.

***Big Idea 1:* Week 1 • Day 2**

A. (circle cow and cat; draw star next to kangaroo)

B. 1. mammal
2. marsupial

C. 1. no 3. yes
2. yes 4. yes

***Big Idea 1:* Week 1 • Day 3**

1. B 2. C 3. A

***Big Idea 1:* Week 1 • Day 4**

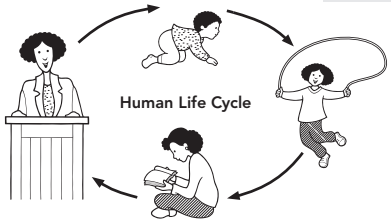
A. baby, joey, adult

B. yes, no, yes

TALK: Answers will vary—e.g., both are places to eat and sleep; the pouch is part of the kangaroo; it is much smaller than a house

***Big Idea 1:* Week 1 • Day 5**

A.



B. 1. marsupial 4. reproduce
2. life cycle 5. adult
3. mammal

***Big Idea 1:* Week 2 • Day 1**

A. 1. insect 2. egg 3. egg

B. (circle beetle, butterfly, bird)

***Big Idea 1:* Week 2 • Day 2**

1. second 3. leaves
2. caterpillar 4. hatch

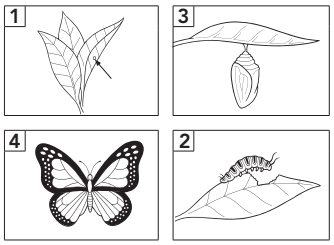
***Big Idea 1:* Week 2 • Day 3**

A. 1. before 2. after 3. before

B. Answers will vary—e.g., so the chrysalis will not be eaten by an animal or damaged by weather

***Big Idea 1:* Week 2 • Day 4**

A.



B. Answers will vary—e.g., alike: life cycle has several stages; different: one lays eggs and the other does not

***Big Idea 1:* Week 2 • Day 5**

A. egg, caterpillar, chrysalis, butterfly

B. (draw and number stages of life cycle)

***Big Idea 1:* Week 3 • Day 1**

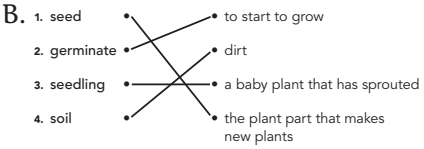
A. seed, germinates

B. 1. to protect the plant inside
2. It sprouts; it pushes out of the seed.

***Big Idea 1:* Week 3 • Day 2**

A. (circle the water, light, soil)

B.

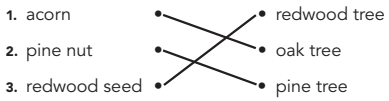


***Big Idea 1:* Week 3 • Day 3**

Answers will vary—e.g., seedling: has seed, no bark, small leaves; sapling: has roots, bark, and leaves

***Big Idea 1:* Week 3 • Day 4**

A.



B. 1. pine 2. code 3. acorns

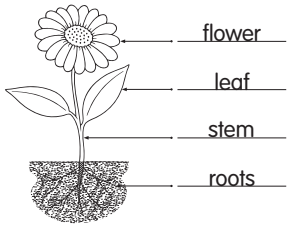
***Big Idea 1:* Week 3 • Day 5**

A. 1. seeds 3. seedling
2. germinates 4. code

B. seed, seedling, sapling, tree

***Big Idea 1:* Week 4 • Day 1**

A.



B. Most seeds come from flowers.

***Big Idea 1:* Week 4 • Day 2**

A. on an animal, in the wind, on an animal

B. 1. pollen 2. bees 3. flowers

***Big Idea 1:* Week 4 • Day 3**

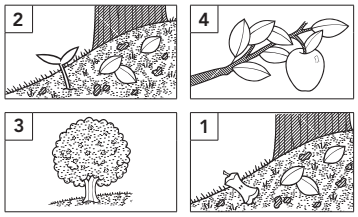
A. apple, yes; spinach, no; tomato, yes; watermelon, yes

B. 1. lettuce 2. fruit

TALK: Answers will vary—e.g., beans, squash, peppers

***Big Idea 1:* Week 4 • Day 4**

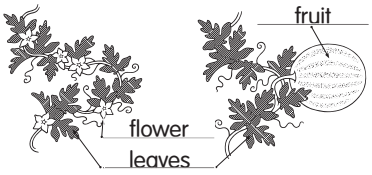
A.



B. 1. false 2. true 3. false

***Big Idea 1:* Week 4 • Day 5**

A.



B. flowers, pollen, fruit

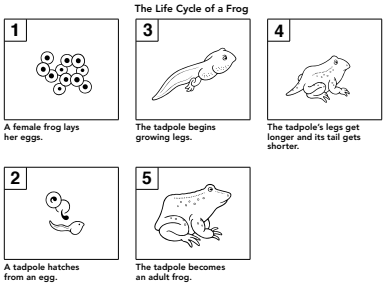
***Big Idea 1:* Week 5 • Unit Review 1**

1. C 4. false
2. A 5. false
3. A 6. true

Big Idea 1: Week 5 • Unit Review 2

1. reproduces, life cycle
2. marsupials, joey
3. caterpillar, chrysalis
4. seed, germinates

Big Idea 1: Week 5 • Unit Review 3



Big Idea 1: Week 5 • Unit Review 4

Answers will vary.

Big Idea 2: Week 1 • Day 1

A. 1. yes 2. no 3. yes
B. 1. all of these
2. brother, sister

Big Idea 2: Week 1 • Day 2

A.

	Wolf	Fox
Weight	140 pounds	30 pounds
Height	3 feet tall	1 foot tall

B. 1. fox 3. wolf
2. wolf 4. fox

Big Idea 2: Week 1 • Day 3

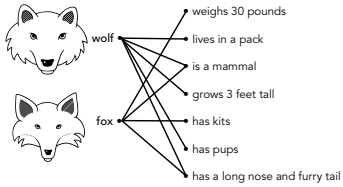
A. 1. pup 2. kit
B. 1. brown 2. red
TALK: Answers will vary—e.g., chick, kitten, joey, colt, lamb, puppy

Big Idea 2: Week 1 • Day 4

A. 1. wolf 3. wolf
2. fox 4. fox
B. Answers will vary—e.g., A wolf is big and a fox is small. The wolf is too big for other predators to attack; the fox is small enough to fit in tiny places to get food or hide.

Big Idea 2: Week 1 • Day 5

A. 1. traits 3. related
2. kit 4. pup
B.



Big Idea 2: Week 2 • Day 1

A.

	Apple	Orange
Grows on trees	yes	yes
Comes in many colors	yes	no
Grows in cold weather	yes	no
Has seeds	yes	yes

B. Answers will vary—e.g., Alike: you can eat them; Different: they have different kinds of skin

Big Idea 2: Week 2 • Day 2

A. 1. easy to pull apart or sweet
2. yellow skin
B. 1. citrus 2. trait 3. citrus

Big Idea 2: Week 2 • Day 3

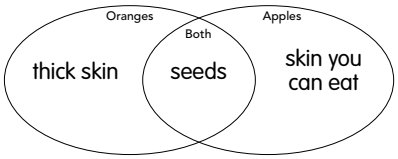
(color apples)
1. Fuji
2. Granny Smith
3. Fuji
4. Golden Delicious

Big Idea 2: Week 2 • Day 4

A. 1. species 2. traits
B. 1. varieties 2. species

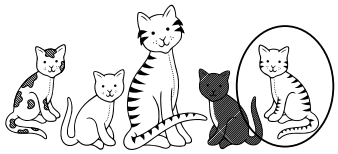
Big Idea 2: Week 2 • Day 5

A. 1. species 3. citrus
2. citrus 4. varieties
B.



Big Idea 2: Week 3 • Day 1

A.



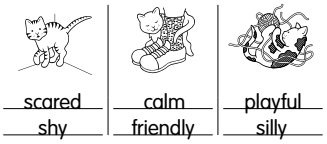
B. four legs, pointy ears
C. 1. kittens
2. puppies
3. offspring

Big Idea 2: Week 3 • Day 2

1. no 3. yes
2. no 4. yes
TALK: Answers will vary—e.g., one parent has stripes and the other has spots

Big Idea 2: Week 3 • Day 3

A. behave
B.

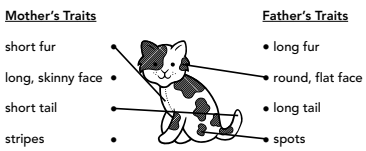


Big Idea 2: Week 3 • Day 4

A. 1. short fur
2. long tail, spots
B. Drawings will vary—e.g., the kitten could have stripes, long hair, or a short tail

Big Idea 2: Week 3 • Day 5

A. resemble, traits, behave
B.



Big Idea 2: Week 4 • Day 1

A. farmed
B.

	Wild grapes	Farmed grapes
Number of seeds	many	few
Size of grapes	small	big
Taste	sour	sweet

Big Idea 2: Week 4 • Day 2

A. 1. B 2. A
B. (circle the grapes that are sweet and large and have few seeds)

Big Idea 2: Week 4 • Day 3

A. 1. grapes 2. crops
B. (circle the corn and grapes)
C. Answers will vary—e.g., bananas

Big Idea 2: Week 4 • Day 4

A. Grapes for jelly: seedless and lots of sugar; Grapes for raisins: easy to dry, strong skin
B. Answers will vary—e.g., bananas: easy to peel, never get brown; (draw a picture)

***Big Idea 2:** Week 4 • Day 5*

A. 1. corn
2. farmed
3. trait
B. grapes on left: has seeds, small; grapes on right: seedless, large

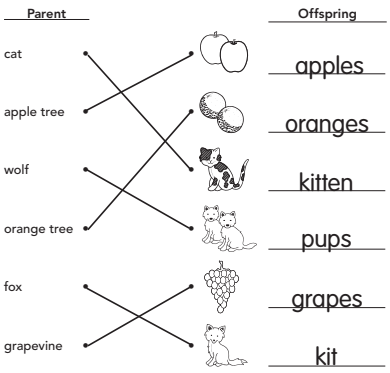
***Big Idea 2:** Week 5 • Unit Review 1*

1. B 2. A 3. C 4. C 5. B

***Big Idea 2:** Week 5 • Unit Review 2*

DOWN	ACROSS
1. crops	3. resemble
2. behave	4. pups
5. species	7. varieties
6. trait	8. offspring

***Big Idea 2:** Week 5 • Unit Review 3*

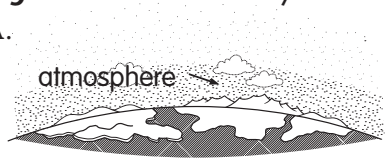


***Big Idea 2:** Week 5 • Unit Review 4*

Answers will vary.

***Big Idea 3:** Week 1 • Day 1*

A.

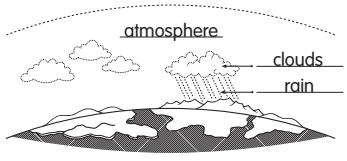


B. 1. atmosphere
2. gases

***Big Idea 3:** Week 1 • Day 2*

A. Answers will vary—e.g.,
1. It gives us weather.
2. It protects us from the sun's rays.

B.



***Big Idea 3:** Week 1 • Day 3*

1. false 2. true 3. true
TALK: because the air is thinner as gravity gets weaker

***Big Idea 3:** Week 1 • Day 4*

A. 1. B 2. A
B. 1. no 2. no

***Big Idea 3:** Week 1 • Day 5*

A. Drawings will vary—e.g., clouds, airplane, birds, rain
B. 1. atmosphere
2. gases
3. gravity
C. Answers will vary—e.g.,
1. We would not have weather.
2. We would be harmed by the sun's rays.

***Big Idea 3:** Week 2 • Day 1*

A. Fresh water: lakes, rivers, underground, ice caps, glaciers; Salt water: oceans
B. 9, 1, 8

***Big Idea 3:** Week 2 • Day 2*

1. false 3. false
2. true 4. true

***Big Idea 3:** Week 2 • Day 3*

A. 1. They drink it.
2. It goes into rivers.
B. (color picture)

***Big Idea 3:** Week 2 • Day 4*

A. 1. no 2. yes 3. no
B. Answers will vary—e.g., take shorter showers; (draw a picture)

***Big Idea 3:** Week 2 • Day 5*

A. surface, oceans, glaciers, evaporating
B. 4, 2, 3

***Big Idea 3:** Week 3 • Day 1*

A. 1. quartz 2. minerals
B. Answers will vary—e.g., It has different colors. The pieces are very small.

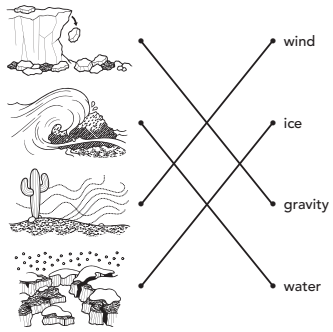
***Big Idea 3:** Week 3 • Day 2*

3, 1, 2
TALK: strong waves because they have more force

***Big Idea 3:** Week 3 • Day 3*

A. 1. clouds
2. (circle middle rock)
B. 1. no 2. yes 3. yes

***Big Idea 3:** Week 3 • Day 4*



weathering

***Big Idea 3:** Week 3 • Day 5*

A. 1. false 2. true 3. true
B. weathering, winds, water, minerals
C. all of these

***Big Idea 3:** Week 4 • Day 1*

A. (circle can, water bottle, glass jar, newspaper)
B. 1. yes 2. no
C. Answers will vary—e.g., newspapers
TALK: It shows a cycle, just like how recycling turns old things into new things again.

***Big Idea 3:** Week 4 • Day 2*

A. (circle newspapers and empty bottles)
B. 1. tire 2. reused 3. can
TALK: Answers will vary—e.g., shoe boxes can become containers

***Big Idea 3:** Week 4 • Day 3*

A. apple, worm, flower
B. 1. Answers will vary—e.g., apple
2. Answers will vary—e.g., tire
C. 1. plastic
2. lettuce
3. both

***Big Idea 3:** Week 4 • Day 4*

A. natural
B. 1. glass 2. metal 3. Oil

Big Idea 3: Week 4 • Day 5

A. 1. true 3. false
2. true 4. true

B.

	Easily recycled	Not easily recycled
Television		✓
Aluminum can	✓	
Newspaper	✓	

C. 1. recycle
2. decompose

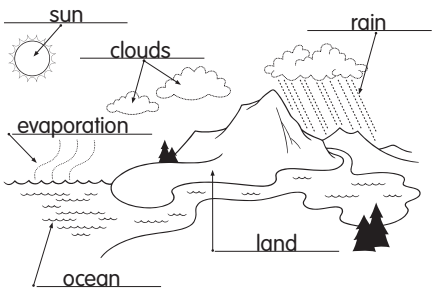
Big Idea 3: Week 5 • Unit Review 1

A. 1. B 2. A 3. B 4. C
B. 1. false 2. true

Big Idea 3: Week 5 • Unit Review 2

1. cold
2. nonliving
3. dead plant
4. a puddle
5. cars
6. wind and water
7. air
8. pull
9. water

Big Idea 3: Week 5 • Unit Review 3



Big Idea 3: Week 5 • Unit Review 4

1. They caught the smallest pieces of gravel.
2. It broke down gravel into smaller particles.
3. The gravel in the shaken jar was broken into smaller particles.

Big Idea 4: Week 1 • Day 1

A. Answers will vary—e.g., Daytime: sun, clouds; Nighttime: moon, stars
B. 1. 24 hours or one day
2. Answers will vary—e.g., play soccer
3. Answers will vary—e.g., go to sleep

Big Idea 4: Week 1 • Day 2

A. (trace path)
B. 1. The sun rises in the east.
2. Our part of Earth faces the sun during the day.
3. The sun looks like it is moving because Earth is moving.

Big Idea 4: Week 1 • Day 3

A. (label day and night and circle stars)
B. 1. no 2. no 3. yes

Big Idea 4: Week 1 • Day 4

A. 1. never 3. warm
2. strange 4. away from
B. Earth

Big Idea 4: Week 1 • Day 5

A.

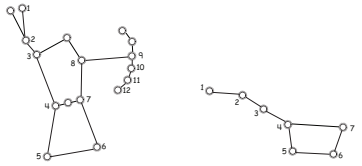
B. rotates, daytime, nighttime, sun, stars

Big Idea 4: Week 2 • Day 1

A. (color stars)
B. 1. false 3. true
2. false 4. false

Big Idea 4: Week 2 • Day 2

A.

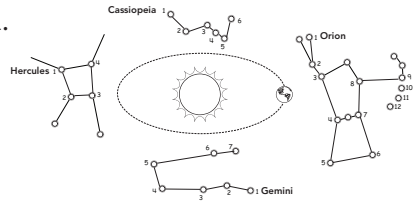


Orion **Big Dipper**

B. 1. stars 2. night

Big Idea 4: Week 2 • Day 3

A.



B. 1. constellation
2. sun
3. Earth

Big Idea 4: Week 2 • Day 4

A. Drawings will vary—e.g., sun; stars
B. 1. true 2. false 3. false

Big Idea 4: Week 2 • Day 5

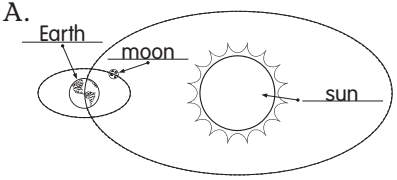
A. star, constellation, Earth
B. 1. Earth rotates.
2. the sun
3. a star

Big Idea 4: Week 3 • Day 1

A. (put check next to first and third sentences)
B. 1. bigger 2. light

Big Idea 4: Week 3 • Day 2

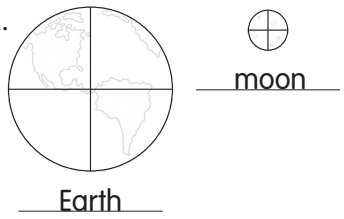
A.



B. 1. 365 2. 28

Big Idea 4: Week 3 • Day 3

A.



B. 1. bigger
2. moons, Earth

TALK: Mars is bigger than the moon because it is a planet. Planets are bigger than our moon.

Big Idea 4: Week 3 • Day 4

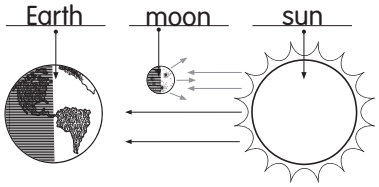
A. 1. yes 2. no
B. 1. (color Io and moon)
2. Io
3. Answers will vary—e.g., Io has volcanoes on it.

Big Idea 4: Week 3 • Day 5

A. (draw lines to show orbits)
B. 1. planet
2. a planet
3. smaller
C. Answers will vary—e.g., The moon does not orbit the sun.

Big Idea 4: Week 4 • Day 1

A.



B. 1. It does not make its own light.
2. Answers will vary—e.g., mirror, water

Big Idea 4: Week 4 • Day 2

A. (color parts of moon)
B. 1. true 2. false 3. false

Big Idea 4: Week 4 • Day 3

TALK: The moon has phases because it orbits Earth. Without an orbit, there would be no moon phases.

Big Idea 4: Week 4 • Day 4

1. December 24, 1973
2. July 22, 1990
3. July 22, 1990

Big Idea 4: Week 4 • Day 5

A.

B. orbits, phase, reflecting, angles

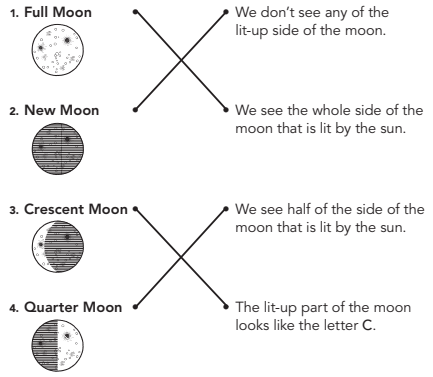
Big Idea 4: Week 5 • Unit Review 1

A. 1. B 3. A
2. C 4. C
B. 1. true 2. false

Big Idea 4: Week 5 • Unit Review 2

DOWN	ACROSS
1. constellation	2. moon
3. rotate	4. star
5. reflects	7. eclipse
6. planet	
8. phase	

Big Idea 4: Week 5 • Unit Review 3



Big Idea 4: Week 5 • Unit Review 4

no, no, no

Big Idea 5: Week 1 • Day 1

A. vibrations
B. (draw a picture and write 2 descriptive words)
C. Answers will vary—e.g., vibrations

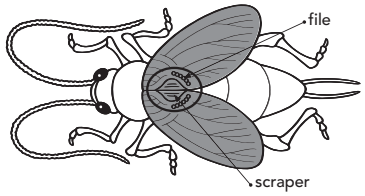
Big Idea 5: Week 1 • Day 2

A.

B. sound, vibrations
C. 1. false 2. true

Big Idea 5: Week 1 • Day 3

A. male crickets
B.



C. 1. spirals 2. ruler

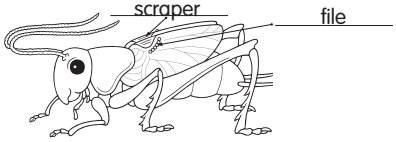
Big Idea 5: Week 1 • Day 4

A. 1. loud 2. high
B.

C. 1. Answers will vary—e.g., whistle
2. Answers will vary—e.g., drum

Big Idea 5: Week 1 • Day 5

A. wings
B.



C. vibrations, sound, volume, pitch

Big Idea 5: Week 2 • Day 1

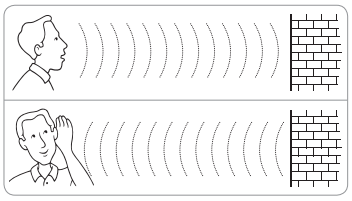
A. 1. waves 3. sound
2. travel
B. 1. false 2. true

Big Idea 5: Week 2 • Day 2

A. Sound waves reflect off the wall.
B. 1. reflect 2. direction
TALK: Answers will vary—e.g., A mirror reflects your face; *Reflect* means to think deeply about something.

Big Idea 5: Week 2 • Day 3

A.



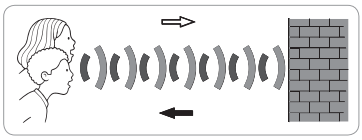
B. 1. false 2. false

Big Idea 5: Week 2 • Day 4

1. A 2. B
TALK: Dolphins and whales use echolocation to find food. They are big animals that need to eat a lot.

Big Idea 5: Week 2 • Day 5

A. sound waves, reflected, echo
B.



C. Answers will vary—e.g., The kids are making an echo.

Big Idea 5: Week 3 • Day 1

1. false 2. false 3. true

***Big Idea 5:** Week 3 • Day 2*

A. 1. no 2. no
B. 3, 1, 2
TALK: No, sound cannot travel without air molecules.

***Big Idea 5:** Week 3 • Day 3*

A. 1. B 2. A 3. C
B. water; Answers will vary—e.g., Sound travels faster through water.

***Big Idea 5:** Week 3 • Day 4*

A. 1. Answers will vary—e.g., The sound is not very loud.
2. Answers will vary—e.g., It sounded louder.
B. Answers will vary—e.g., The stethoscope sends sound waves to the doctor's ears.

***Big Idea 5:** Week 3 • Day 5*

A. 1. metal
2. molecules
3. air
B. liquids, molecules, sound waves

***Big Idea 5:** Week 4 • Day 1*

A. 1. outer
2. middle
3. inner
B. (funnel)

***Big Idea 5:** Week 4 • Day 2*

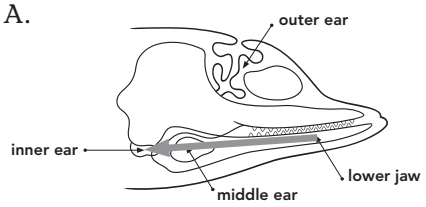
A. 1. false 2. true
B. (circle earmuffs)
C. Answers will vary—e.g., It helps them to hear sounds from all directions better.

***Big Idea 5:** Week 4 • Day 3*

A. A snake uses its ears to find its food.
B. A snake's jaw touches the ground, but the top of its head does not.
C. Answers will vary—e.g., I can hear the bell for recess.

***Big Idea 5:** Week 4 • Day 4*

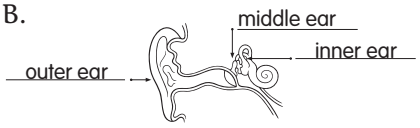
A.



B. fish/water, cat/air, worm/ground

***Big Idea 5:** Week 4 • Day 5*

A. 1. outer 2. inner 3. hears
B.



C. Answers will vary—e.g., An animal must have an inner ear to hear sound.

***Big Idea 5:** Week 5 • Unit Review 1*

1. A 4. A
2. B 5. C
3. C

***Big Idea 5:** Week 5 • Unit Review 2*

1. d	5. b	9. j
2. a	6. l	10. i
3. g	7. k	11. c
4. e	8. f	12. h

***Big Idea 5:** Week 5 • Unit Review 3*

C A
B D

***Big Idea 5:** Week 5 • Unit Review 4*

1. Answers will vary—e.g., I could hear my partner's voice.
2. Answers will vary—e.g., I can feel the vibrations with my finger.
3. Answers will vary—e.g., The sound travels by vibration.

***Big Idea 6:** Week 1 • Day 1*

A. bar, horseshoe, ring
B. Pictures will vary—e.g., photos, drawings, report cards, to-do lists, and so on

***Big Idea 6:** Week 1 • Day 2*

A. metal
B. (circle needle, paper clip, screw)
C. Answers will vary—e.g., They are metal.

***Big Idea 6:** Week 1 • Day 3*

A. yes, no, no, yes
B. iron
C. Answers will vary—e.g., refrigerator, metal bookcase, metal chair

***Big Idea 6:** Week 1 • Day 4*

A. (circle homework, note, picture, leaf)
B. 1. false 2. false 3. true

***Big Idea 6:** Week 1 • Day 5*

A. magnet, magnetism, magnetic
B. 1. iron 2. metal
C. (circle refrigerator, car, screw)

***Big Idea 6:** Week 2 • Day 1*

A. (trace magnetic field; circle paper clip and nail)
B. 1. magnetic field
2. attract

***Big Idea 6:** Week 2 • Day 2*

A. 1. two
2. the poles
3. Answers will vary—e.g., I would use the poles of the magnet because that is the strongest part.
B. 1. false 2. true 3. false

***Big Idea 6:** Week 2 • Day 3*

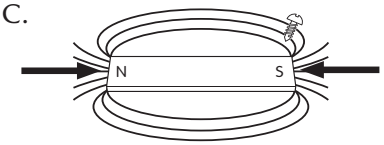
1. south 3. north
2. north 4. south

***Big Idea 6:** Week 2 • Day 4*

Drawings will vary—e.g., a belt that uses magnets to stay closed

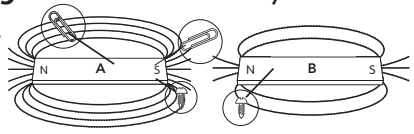
***Big Idea 6:** Week 2 • Day 5*

A. 1. B 2. A
B. 1. repel 2. pole
C.



***Big Idea 6:** Week 3 • Day 1*

A.



B. 1. A 2. A 3. A

Big Idea 6: Week 3 • Day 2

1. Hold a paper clip close to the nail.
2. Get a nail and a magnet.
3. Rub the nail across the magnet many times, in one direction.
4. Hold up the paper clip with the nail.

Big Idea 6: Week 3 • Day 3

A. (circle magnet on left); attracted (or attached) to the poles
B. electromagnet, temporary, magnetic field

Big Idea 6: Week 3 • Day 4

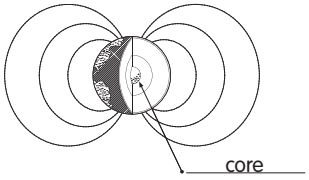
A. 1. a star
2. magnetism
B. Drawings and sentences will vary—e.g., a drawing of a nail; A magnet holds up a nail.

Big Idea 6: Week 3 • Day 5

A. 1. permanent
2. electromagnet
3. temporary
B. strong, weak
C. Answers will vary—e.g., It goes away.

Big Idea 6: Week 4 • Day 1

A. magnetic field, two poles
B.

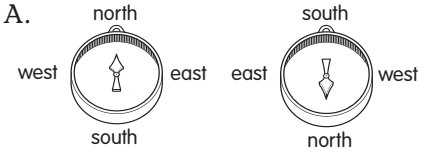


Big Idea 6: Week 4 • Day 2

A. 1. needle 2. north 3. dial
B. Answers will vary—e.g., Today, people use maps and GPS.

Big Idea 6: Week 4 • Day 3

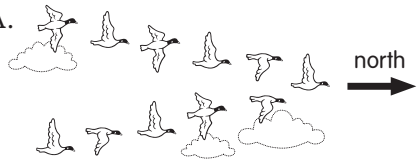
A.



B. 1. true 2. false 3. false
TALK: The compass would point to the strong magnet.

Big Idea 6: Week 4 • Day 4

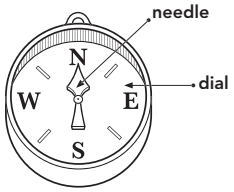
A.



B. 1. true 2. false 3. true

Big Idea 6: Week 4 • Day 5

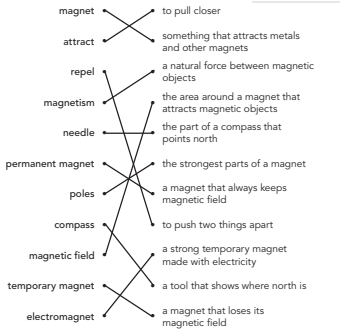
A. 1. directions
2. compass
3. needle
4. core
B.



Big Idea 6: Week 5 • Unit Review 1

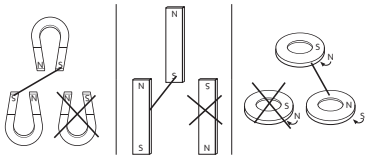
1. D 2. B 3. A 4. C 5. A

Big Idea 6: Week 5 • Unit Review 2



Big Idea 6: Week 5 • Unit Review 3

A. Drawings will vary—e.g., metal can, bottle cap, wires, nail
B.



Big Idea 6: Week 5 • Unit Review 4

1. 50 times
2. Answers will vary.
3. temporary
4. weak

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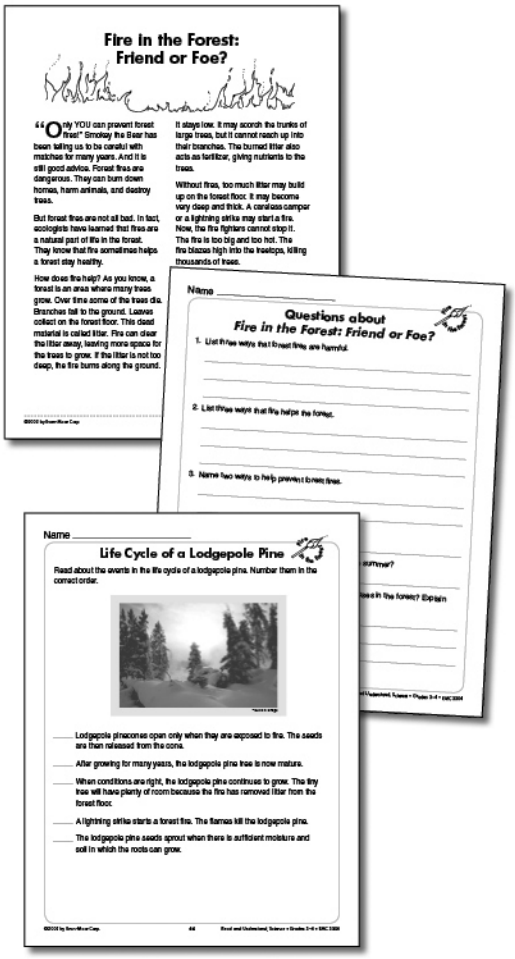

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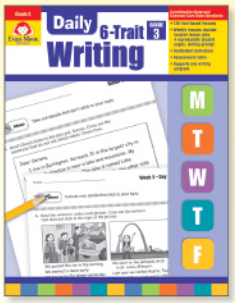

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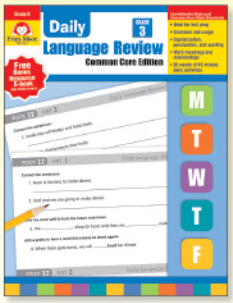

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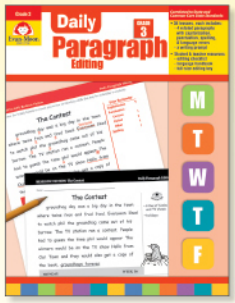

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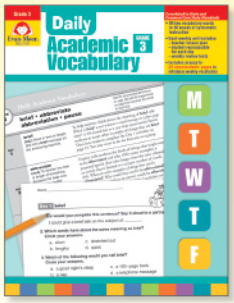
Grades 2–8



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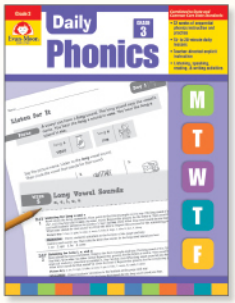

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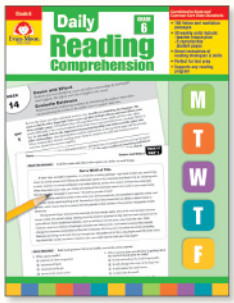

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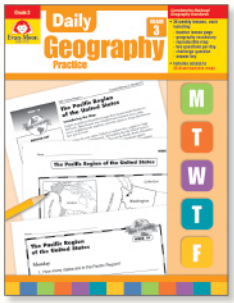

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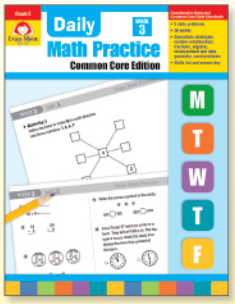

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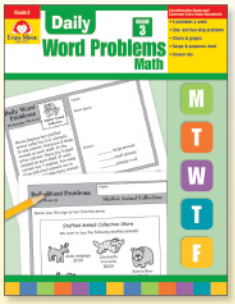

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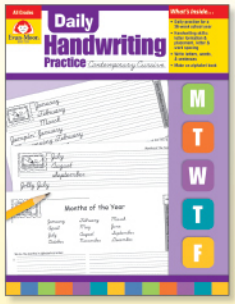

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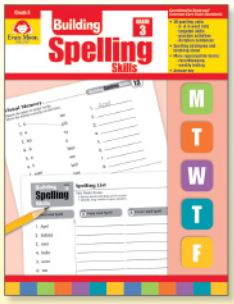

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