Unit 1

The Nature of Science

What is science?

Lesson Plan

Unit Opener & Lesson 1 What questions do scientists ask?			
	Activity	**Pages**	**Time**
Engage	• Unit Opener: Think! *What is the girl doing?* • Unit Opener: Things that help us observe. • Unit Opener: Comparing things. • Think! *Pretend you are a scientist. What animal do you want to study? Why?*	SB p. 4 SB p. 4 SB p. 4 SB p. 7	5 min 10 min 10 min 10 min
Explain	• How scientists work together and observe objects • Questions scientists ask • More questions scientists ask	SB p. 5 SB p. 6 SB p. 7	20 min 20 min 20 min
Elaborate	• Describe Seeds • Questions and Answers • Kangaroos and Frogs	TB p. 5 TB p. 6 TB p. 6	20 min 30 min 15 min
Evaluate	• *Lesson 1 Check* (ActiveTeach) • Assessment for Learning • Review (Lesson 1) • *Got it? Self Assessment* (ActiveTeach) • *Got it? Quiz* (ActiveTeach)	TB p. 15a TB p. 7 SB p 15 TB p. 15b TB p. 15b	10 min 10 min 10 min 10 min 10 min

Lesson 2 How do scientists observe?			
	Activity	**Pages**	**Time**
Engage	• Think! *Is a pencil a tool?* • Think! *Are all fish alike?* • Think! *What are some school rules and home rules?*	TB p. 9 TB p. 10 TB p. 11	5 min 5 min 5 min
Explore	• Digital Lab: *How do we observe?* (ActiveTeach)	TB p. 8	30 min
Explain	• The five senses and observation • Tools and measuring • Comparing • Grouping and safety	SB p. 8 SB p. 9 SB p.10 SB p. 11	30 min 30 min 30 min 30 min
Elaborate	• Observe and Describe • Apples and Orange • Let's compare our fish! • At-Home Lab: Group Objects • Card Sort	TB p. 8 TB p. 9 TB p. 10 SB p. 11 TB p. 11	30 min 20 min 20 min 20 min 20 min
Evaluate	• *Lesson 2 Check* (ActiveTeach) • Assessment for Learning • Review (Lesson 2) • *Got it? Self Assessment* (ActiveTeach) • *Got it? Quiz* (ActiveTeach)	TB p. 15a TB p. 11 SB p. 15 TB p. 15b TB p. 15b	10 min 10 min 10 min 10 min 10 min

Lesson 3 How do scientists collect and record data?			
	Activity	**Pages**	**Time**
Engage	• Think! *What do scientists do?*	TB p. 13	10 min
Explain	• Testing ideas • Collecting, recording, and sharing data • *Got it? 60-Second Video* (ActiveTeach)	SB p. 12 SB p. 13 TB p. 13	30 min 30 min 10 min
Elaborate	• Flash Lab: Do a Test and Record Data • Observe!	TB p. 12 TB p. 12	20 min 20 min
Evaluate	• *Lesson 3 Check* (ActiveTeach) • Assessment for Learning • Review (Lesson 3) • *Got it? Self Assessment* (ActiveTeach) • *Got it? Quiz* (ActiveTeach)	TB p. 15a TB p. 13 SB p. 15 TB p. 15b TB p. 15b	10 min 10 min 10 min 10 min 10 min
Lab	• *Let's Investigate! How do things look?* (ActiveTeach)	SB p. 14	30 min

Flash Cards

scientist

observe

objects

questions

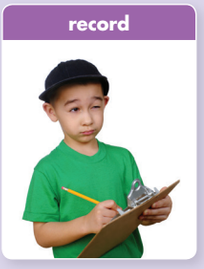
senses

tools

measure

compare

record



Lesson 1

Key Words	ELL Support
scientist, science, observe, objects, questions, answers	**Vocabulary:** *learn, hand lens, size, shape, color, seeds, diver, ocean, frog, baby, kangaroo, pouch, move, jump, firefly, fireflies, glow, light up, monkey, fish, bird, cat, dog, pretend* ***Wh-* Questions:** *what, where, why*

Lesson 2

Key Words	ELL Support
senses, tools, measure, compare, group	**Vocabulary:** *sound, bird, dog, fish, frog, sandwich, feather, shell, block, rock, bean, pattern, hand lens, ruler, balance, better, weigh, more, butterfly, alike, different, big, small, safety, safe, rules, goggles* **Verb:** *be*

Lesson 3

Key Words	ELL Support
collect, data, record (v), *chart*	**Vocabulary:** *words, pictures, numbers, mark, soak up, follow*

Unit 1 The Nature of Science

Unit Objectives

Lesson 1: Students will learn that scientists ask questions to learn.

Lesson 2: Students will learn ways scientists observe things.

Lesson 3: Students will learn how scientists collect and record data.

Vocabulary: *science, scientist, observe, ruler, hand lens, clock, observe, size, bird, alike, flower, grass, beak, tail*

Introduce the Big Question

What is science?

Build Background Say *What time is it?* Look at your watch and write the time on the board. Have students gather around you. Hold up a piece of paper or book. Say *How long is it? Let's observe!* Take out a ruler and measure. Record the measurement. Then say *What does it look like?* Look at a piece of paper or a page of a book through a hand lens. Say and write *I can see (the letters).* Finally, say *What time is it?* Again, look at your watch and record the new time. *What did we find out? How big (the paper) is! What it looks like!* Point to the times. *How long did it take us to observe these things? It took us (five) minutes!*

Engage

Think!

What is the girl doing?

Draw students' attention to the picture. Read the question aloud. Allow students time to discuss what they think the girl is doing. Provide support as needed.

1 Circle what you can use to see things.

Point to the pictures and elicit or say the names of the items. *What can you do with a ruler? What can you do with a hand lens? What can you do with a clock?* (Possible answers: *See how (long) things are. Look at things. Tell the time.*) Read the question aloud and invite students to circle the answer. Check answers as a class.

2 Circle the part of your body you can use to observe the color of a bird.

Invite students to identify the body parts pictured and the senses associated with each body part. *What can you do with your eyes? See!* Then ask questions to solicit what sense can tell students about a bird's color. *Do your hands tell you what color a bird is? No! Can you smell what color a bird is? No!* Read the instructions and allow students time to circle the answer. Check answers and invite students to describe birds that they've seen outdoors or on TV.

3 Mark (✔) the birds that look alike. How do they look alike? Say as a class.

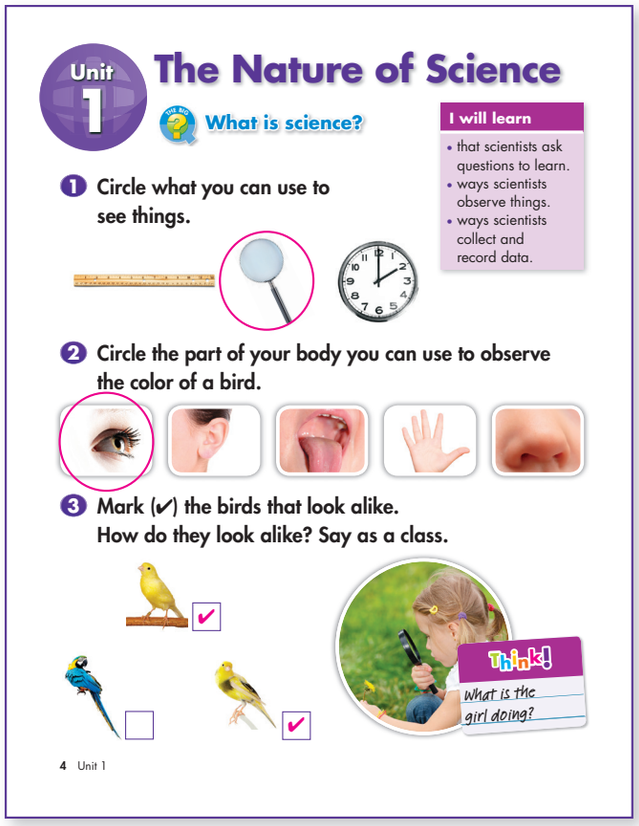
Draw students' attention to the pictures of the birds. *Have you ever seen birds like these ones? Where? What did they look like?* Provide vocabulary support as needed. Point out similarities and differences. *What color are these two birds? Yellow! This bird has some black on it. This bird does, too.*

Draw students' attention to the shapes and sizes of the birds as well. *Look at this bird. It has a long tail! Its beak has a different shape, too.*

Ask students to mark which birds are alike. Invite volunteers to say which birds they picked and encourage them to explain how the birds they picked look alike. Accept all logical answers

Think! Again!

Revisit the question *What is the girl doing?* Invite students to share their ideas freely. (Possible answers: *She is looking at the flower. She is observing the flower petals.*) Provide vocabulary support as needed and accept all logical answers.



Lesson 1

What questions do scientists ask?

Objective: Learn that scientists ask questions and observe.

Vocabulary: *scientist, science, observe, objects, size, shape, color, seeds, diver, ocean, tool*

Digital Resources: Flash Cards (*scientist, observe, objects*)

Materials: hand lens (1 per small group), sets of small edible seeds of different shapes, sizes, and colors (chia, sesame, amaranth, poppy, cumin, rice, etc.)

Unlock the Big Question

Write the following text on the board: *I will learn how scientists work. What questions do they ask? How do they observe?*

ELL Vocabulary Support

Review or pre-teach *hand lens* and *seeds*. Hold up a hand lens. *What is this? It's a tool that helps us see things! What are seeds? Plants grow from seeds.* Explain that not all seeds are edible.

Build Background Set out different kinds of seeds in separate areas. Divide the class into the same number of groups as kinds of seeds. Distribute a hand lens to each group. Each group starts with a different seed and students take turns examining the seeds. *Does the hand lens help you see the seeds? What do the seeds look like?* Explain to students that they just did something scientists do and that they will learn more about what scientists do.

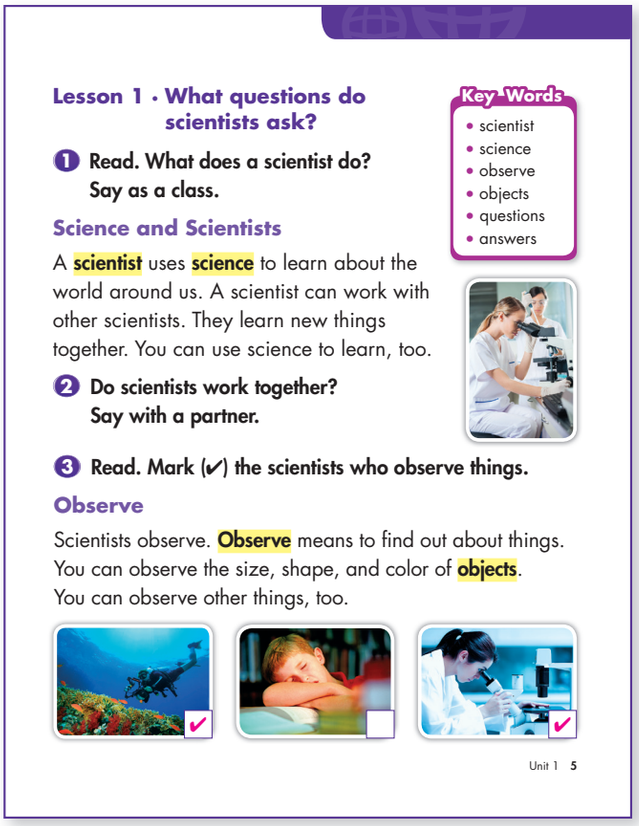
Explain

1 Read. What does a scientist do? Say as a class.

Show the *scientist* Flash Card and elicit the word. Read the paragraph aloud for students and ask the question. Guide students to answer. *Scientists learn about the world around us.*

2 Do scientists work together? Say with a partner.

Read the paragraph aloud again. Pair students and have them discuss the answer. Ask them to point to where in the paragraph or on the page they learn that scientists can work together. Draw students' attention to the photo of the two scientists. Ask students to describe what they are doing. Provide vocabulary support as necessary and accept all logical answers.



Lesson 1 · What questions do scientists ask?

Key Words
- scientist
- science
- observe
- objects
- questions
- answers

1 Read. What does a scientist do? Say as a class.

Science and Scientists

A **scientist** uses **science** to learn about the world around us. A scientist can work with other scientists. They learn new things together. You can use science to learn, too.

2 Do scientists work together? Say with a partner.

3 Read. Mark (✓) the scientists who observe things.

Observe

Scientists observe. **Observe** means to find out about things. You can observe the size, shape, and color of **objects**. You can observe other things, too.

Unit 1 5

3 Read. Mark (✓) the scientists who observe things.

Display the *observe* and *objects* Flash Cards. Ask students to describe what they see. Then draw their attention to the three photos. Elicit from students or describe what the person in each photo is doing. *Look! This person is underwater. It's a diver! The diver observes fish, coral, and other animals.*

Read the paragraph. Elicit from students what *observe* can mean. (*To find out about things.*) Read the instructions and have students mark the pictures. Check answers as class and discuss students' answers.

Elaborate

Describe Seeds

Have students get in their groups from the beginning of class and examine the seeds again, following the same procedure. Write the names of each kind of seed on the board. *Let's observe the seeds!* Ask questions *How big are the seeds? What color are they? Are they the same shape as the other seeds?*

Encourage students to describe or draw and compare with one another the color, size, and shape of each kind of seed. Record on the board some of the descriptions of each kind of seed. It does not matter whether students describe the seeds correctly or identify them, only that students engage in the process of observing and comparing. *We are asking questions and observing. We found out that (sesame) seeds have a different shape and color than (rice). You're little scientists!*

Lesson 1

What questions do scientists ask?

Objective: Learn what kind of questions scientists ask and answer.

Vocabulary: *questions, answers, animals, frog, kangaroo, pouch, what, where, why, how, move, jump*

Digital Resources: Flash Card (*questions*), *I Will Know...* Digital Activity

Build Background Write *Question* and *Answer* on the board. Show the *questions* Flash Card and explain. *A question is something we ask. For example,* How old are you? *We ask questions about people, places, and objects.* Elicit from students other things we ask questions about. (Possible answers: *the weather, food, people's feelings,* etc.) *An answer is what we find out. When we get answers to our questions, we learn things!* Elicit from students a question and write it under *Question*. Point out the question mark. Then elicit an answer and write it under *Answer*. (*What color is the sky? It is blue.*)

Explain

4 Look at the leaves. What can you say about them? Say with a partner.

Pair students. Ask them to look carefully at the photos and to describe the leaves in each photo. Invite volunteers to share their answers with the class. (Possible answers: *They're (red). They're (small).*)

ELL Vocabulary Support

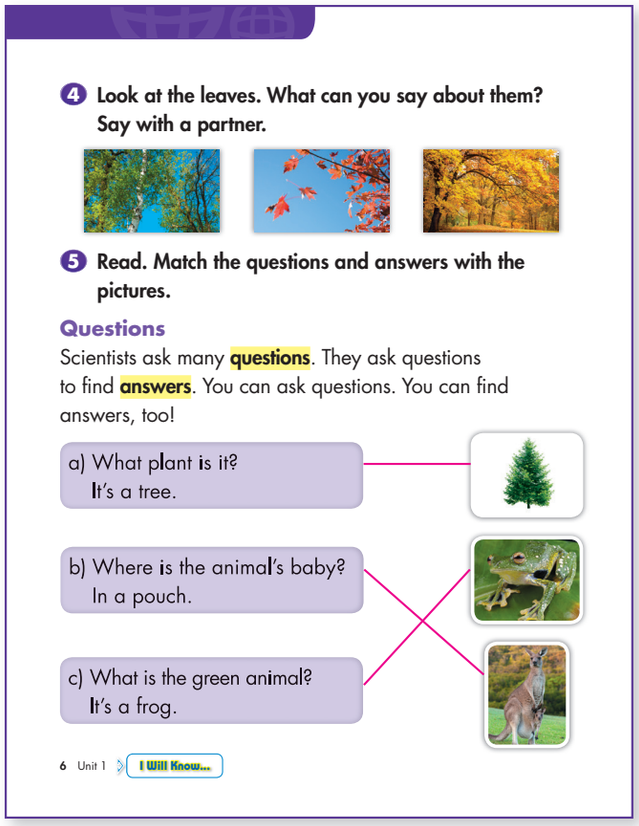
Point out the pictures on the right-hand side of the page. Elicit or identify for students the plants and animals: *pine tree, frog, kangaroo*. Point out that the kangaroo has a baby. *It keeps its baby in its pouch!*

5 Read. Match the questions and answers with the pictures.

Read the paragraph aloud. Explain the instructions and then read the questions and answers. Elicit the question and answer in each instance and write them under the headings on the board.

Remind students that scientists ask questions and observe to get answers. Invite students to match the question and answer pairs to the pictures.

Ask questions to check answers. *What does question a ask about? It asks about a plant. Which picture shows a plant? The first picture. What is the answer? It's a tree!*



ELL Language Support

Point to the questions on the board. Underline *What color, Where is,* and *What kind*. Explain that we can use these words to ask questions. You may wish to add *Why* and *How* questions as well. You may also wish to point out the rising inflection at the end of questions.

Elaborate

Questions and Answers

Divide the class into small groups. Refer students back to the pictures for exercise 5. *What other questions can we ask?* Encourage groups to brainstorm. Remind students they can use the samples on the board to help start new questions. Monitor and provide support as needed. (Possible questions: *What color is the tree? What is the animal in the picture? How big is the frog? Why does the frog have big eyes?*)

Kangaroos and Frogs

Write *How do kangaroos and frogs move?* on the board. Take students outside. Divide the class into Kangaroos and Frogs. Kangaroos hold their arms loosely in front, like the kangaroo in the picture, and jump using both feet when you call out *Kangaroos*. Frogs get down on all fours and "jump" when you say *Frogs*. Groups switch animals and repeat. Finally, return to the classroom and, as the answer to the question, write *Frogs and kangaroos jump.*

I Will Know...

Have students do the *I Will Know...* Digital Activity.

Lesson 1

What questions do scientists ask?

Objective: Learn more about questions scientists ask.

Vocabulary: *what, where, why, firefly, fireflies, glow, light up, light, monkey, frog, kangaroo, fish, bird, cat, dog, pretend*

Digital Resources: Flash Card (*questions*), *Lesson 1 Check* (print out 1 per student)

Materials: Animal Cards (selections, including *cat, dog, firefly, fish, frog, kangaroo, monkey,* and *parrot/bird*)

Build Background Put the Animal Cards face down on a table. Invite volunteers to come up, one at a time, turn over a card, and mime the animal for the class. The class guesses the animal. Invite volunteers to say something about each animal. *It's a bird/parrot. A bird/parrot has feathers. It can fly. It's a cat. A cat says meow. It's a firefly. Fireflies glow, or light up.* Provide support as necessary.

Explain

6 Look at the pictures. What are three questions the boy can ask about the animals? Say as a class.

Point to the first picture and have students read the questions. Then draw students' attention to the second and third pictures. *What is in the third picture? A firefly. What does the boy have in the jar? Fireflies!*

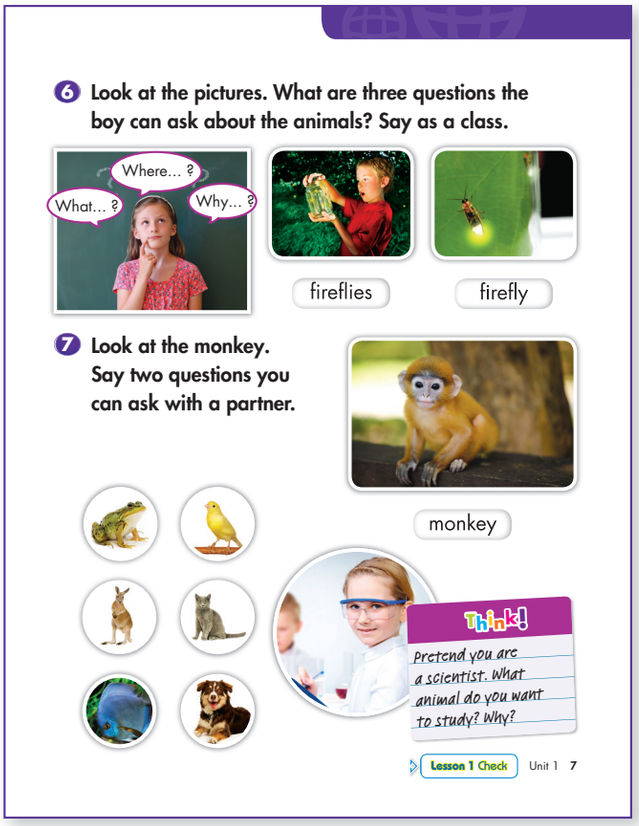
Next, read the question and solicit ideas. Write students' ideas on the board. Accept all logical questions, but encourage students to include a *What*, a *Where*, and a *Why* question. If students do not come up with it on their own, ask *Why do fireflies glow?* Explain to students that fireflies can make their own light. *Other fireflies can see them!*

ELL Content Support

Fireflies are a kind of beetle, and there are more than 2,000 species of fireflies. Some of these species flash lights at night, which can be yellow, green, or orange. They do this to attract each other or to protect themselves from predators. Other creatures, such as deep-water fish, can also create their own light.

7 Look at the monkey. Say two questions you can ask with a partner.

Draw students' attention to the picture of the monkey and have them identify the animal. Pair students and read the instructions. Have students brainstorm questions they can ask. Monitor and provide support. If necessary, point to the questions the girl asks in the photo at the top of the page to help students form questions. (*Where is the monkey? What does the monkey do? What color is the monkey?*)



Think!

Pretend you are a scientist. What animal do you want to study? Why?

Draw students' attention to the photo of the girl and read the question. Point to the pictures on the left and elicit or identify the animals. Ask students whether they would like to study these or any other animals. *What do you want to know about the animal?* Allow time for all students to answer, and encourage each student to ask a question about each animal that they'd like to study.
(*I want to study frogs. Where do they live? I want to study kangaroos. How high can they jump?*) Provide support as necessary and accept all logical answers.

Evaluate

Lesson 1 Check **Assessment for Learning**

Review the Key Words for Lesson 1 (see Student's Book page 5). Distribute the *Lesson 1 Check* and guide students as they complete it. Check answers as a class. Then ask students to grade their progress on the topic of what questions scientists ask from 1 to 3: 3 = *I understand what questions scientists ask*; 2 = *I need to study more*; 1 = *I need help!* Encourage students giving themselves a 1 or a 2 to say what they found difficult and what they need to study more.

Lesson 2

How do scientists observe?

Objective: Learn about observing using the five senses.

Vocabulary: *senses, sound, bird, dog, fish, frog, sandwich, feather, shell, block, rock, bean, pattern*

Digital Resources: Flash Card (*senses*), *Let's Explore!* Digital Lab

Materials: shell, wooden block, feather, patterned paper, rock, dried bean, hand lens, bell, fruit

Unlock the Big Question

Write the following text on the board: *I will learn some ways scientists observe.*

Build Background Display the *senses* Flash Card. Invite students to identify each body part and the sense associated with it. Provide support as needed.

Explore

Let's Explore! Lab How do we observe?

Objective: Learn some ways to observe and describe objects.

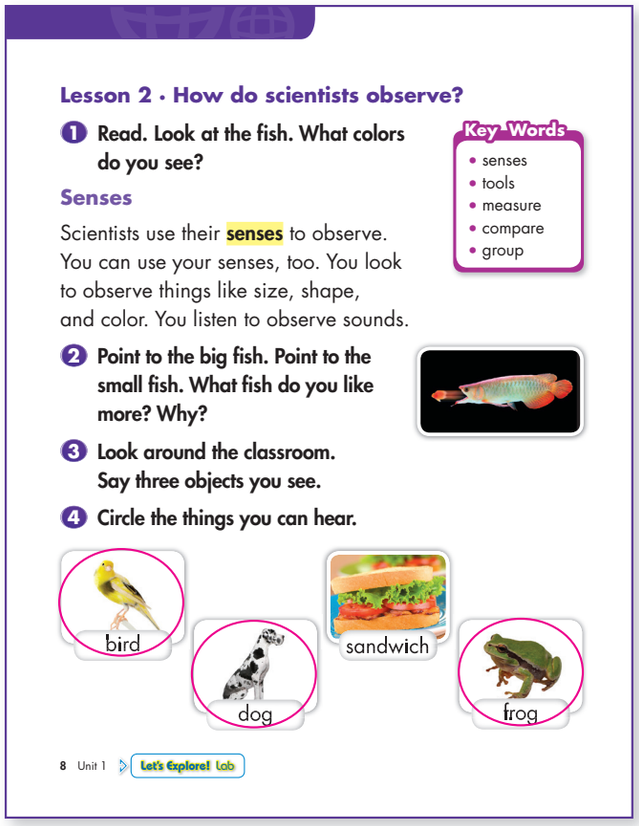
Digital Resources: *Let's Explore!* Digital Lab, *Let's Explore! Activity Card* (1 per student)

- Gather students around a desk or table. Display the items and identify them. Model how to observe objects by looking, feeling, smelling, and hearing. Drop some on the table to see if they make a noise.
- Invite a volunteer to pick up one of the items, and ask questions that elicit descriptions. *What color is it? What size is it? Is it big or small? How does it feel? Is it (soft)? What sounds does it make?* Provide vocabulary support as necessary and write some descriptors on the board next to the name of the corresponding item. Repeat with the other objects.
- Show the Digital Lab and invite groups to do the activity. Remind students they can refer to information on the board as they go through the activity.
- Have students work in pairs to complete the *Activity Card*.

Explain

1 Read. Look at the fish. What colors do you see?

Read the paragraph aloud. Draw students' attention to the fish and ask the question. Accept all logical answers.



Lesson 2 · How do scientists observe?

1 Read. Look at the fish. What colors do you see?

Key Words
- senses
- tools
- measure
- compare
- group

Senses

Scientists use their **senses** to observe. You can use your senses, too. You look to observe things like size, shape, and color. You listen to observe sounds.

2 Point to the big fish. Point to the small fish. What fish do you like more? Why?

3 Look around the classroom. Say three objects you see.

4 Circle the things you can hear.

bird dog sandwich frog

8 Unit 1 Let's Explore! Lab

2 Point to the big fish. Point to the small fish. What fish do you like more? Why?

What sizes are the fish? One is big, and one is small! Invite students to point accordingly and answer which they like more. Encourage students to explain why they answered the way they did. (*I like orange. It's big.*) Provide support as necessary.

3 Look around the class. Say three objects you see.

Invite students to look around and name three objects. Invite volunteers to share. *(John), what can you see? I see a pencil.* Write the names of some of the objects on the board and practice the words.

4 Circle the things you can hear.

What do you hear with? My ears! Invite volunteers to identify the items pictured by reading the labels. *Can you hear a dog? Yes! Can you hear a sandwich? No!*

Elaborate

Observe and Describe

Have students review exercise 2, page 4. Gather students around again. Invite a volunteer to ring the bell. *This is a bell. It makes a sound. What body part can you use to hear sounds?* Have students say or point to the appropriate picture(s) in the book. Elicit or provide descriptions. *What is the sound like? The bell makes a nice sound. Do you like it?* Provide support as necessary. Repeat with the other items to emphasize which senses we can use to describe each one. End with the fruit. Guide students to notice that they can see, smell, touch, and taste the fruit.

Lesson 2

How do scientists observe?

Objective: Learn about some tools for observing things.

Vocabulary: *tools, hand lens, ruler, balance, measure* (v), *sandwich, better, weigh, more*

Digital Resources: Flash Cards (*tools, measure*), *I Will Know…* Digital Activity

Materials: 2 apples, 1 orange, balance

Build Background Display the *tools* and *measure* Flash Cards. *What tools can you see? What do they help us do?* Elicit plausible answers. Explain to students that scientists can use tools to observe things, too. *Scientists use their senses to observe things. They can use a hand lens to help them see things better.* Explain that a tool is anything that helps you do something and that some tools can help you observe.

Explain

5 Read. Circle the tools.

Read the paragraph aloud for students. Write the names of the tools on the board and say them aloud for students to repeat. Then have students circle the tools. Check answers as a class.

Ask questions to check comprehension. *What is a tool? Something that helps us do something, like observe. Say one tool.* (*Balance.*) *What does* measure *mean? To find out how much, how long, or how tall.*

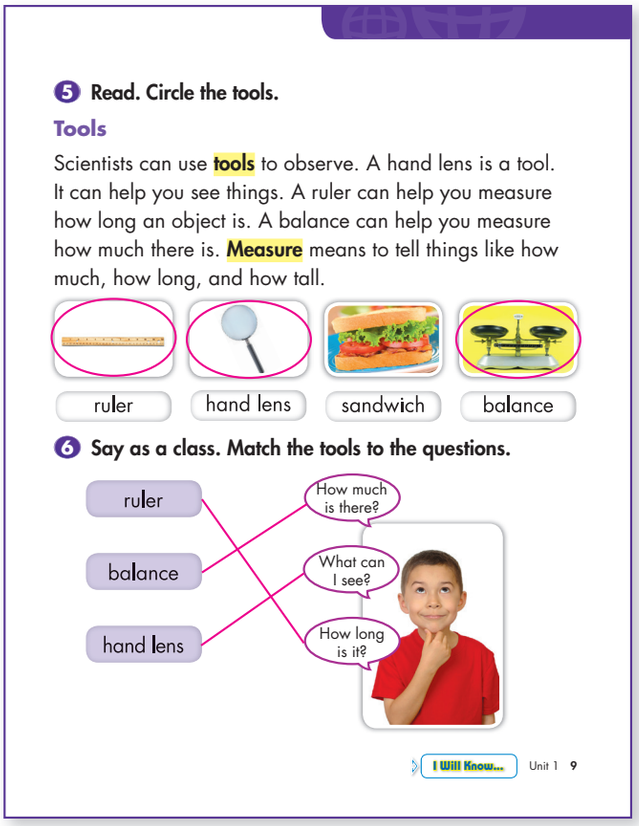
6 Say as a class. Match the tools to the questions

Invite volunteers to read each word in the colored boxes. Read the first speech bubble aloud and ask students to shout out which tool matches the question. (Answer: *Balance.*) Repeat for the remaining words and speech bubbles. Finally, have students match the words to the questions in their books.

ELL Vocabulary Support

Write *Tools* on the board. Give a definition of *tool* and check understanding. Then practice some of the new vocabulary. *Some tools help us to observe. To observe is to find out about things. Can you name a tool that helps us to see? A hand lens! Right!* Write *hand lens* under *Tools*. *What is a tool that helps us to measure? A* (*ruler*). Add (*ruler*).

Challenge students to name as many tools as they can think of and to say or mime what they can help us do. *Right! A crayon helps us to draw. A pencil helps us to write.*



Elaborate

Apples and Orange

Gather students around a desk or table. Display the balance and have students identify it and what it does. (*Balance. It tells how much, or weighs things.*) Display the fruit and elicit their names or identify them for students. *We're going to weigh the apples and orange. Which do you think weighs more?* Allow students to hold the fruit and make guesses. Write *apples* and *orange* on the board. Weigh the fruit and record the weights under the appropriate word. *How much do the apples weigh? How much does the orange weigh?* Record the relevant weights. *Were you right?*

Think!

Is a pencil a tool?

Remind students how they use a pencil and what it helps them do. Then ask the question and guide students to answer that a pencil is a tool we can use to write things.

I Will Know...

Have students do the *I Will Know…* Digital Activity.

Lesson 2

How do scientists observe?

Objective: Learn how to compare.

Vocabulary: *butterfly, compare, alike, different, big, small*

Digital Resources: Flash Cards (*tools, measure, compare*), Animal Cards (*fish* and *goldfish*; make copies so each student has one card)

Build Background Display the *tools* and *measure* Flash Cards and review with students what they have learned about how scientists observe. *What is one way scientists observe things? They use their senses. What is another way they observe things? They can use tools to observe, too. We're going to learn another way scientists can observe things. They can say how things are alike and different!*

Explain

7 **Circle *T* (true) or *F* (false).**

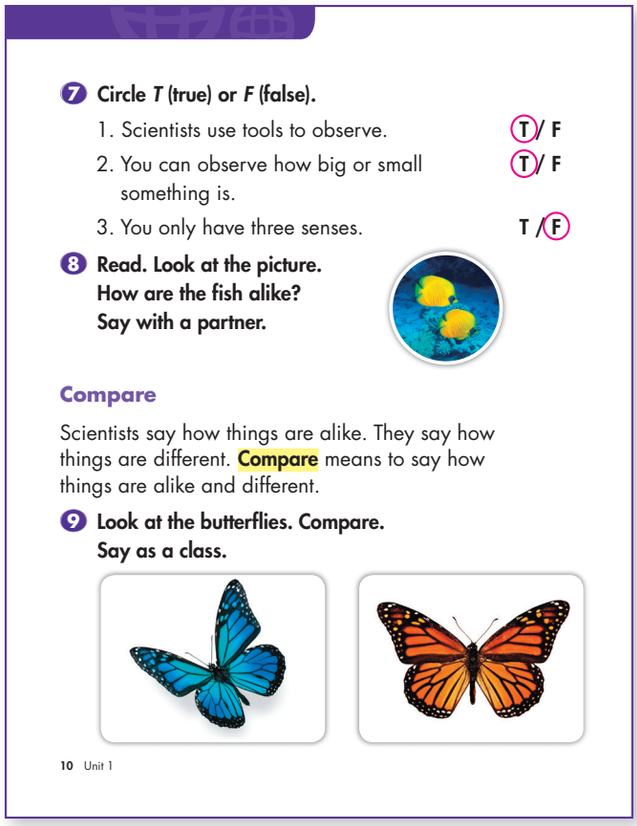
Read each sentence for students and allow time for them to circle the answers. Check answers and correct the false statement as a class. (*You have five senses.*)

8 **Read. Look at the picture. How are the fish alike? Say with a partner.**

Display the *compare* Flash Card and ask students to discuss the similarities and differences between the apple and the orange. Have students read the paragraph silently. Write *compare* on the board and ask volunteers to say what it means. (*To look at the similarities and differences between two items.*) Then draw students' attention to the photo of the fish. *How many fish are there? Two. How are they alike?* Have pairs answer the question and share their answers with another pair. (Possible answers: *They are yellow. They are the same color. They are about the same size.*)

9 **Look at the butterflies. Compare. Say as a class.**

Point to the butterflies. *How are they alike? How are they different?* (Possible answers: *They are butterflies. They have the same shape. They are different colors.*) Ensure students notice both how the butterflies are alike and how they are different.



7 **Circle *T* (true) or *F* (false).**

1. Scientists use tools to observe. (T) / F
2. You can observe how big or small something is. (T) / F
3. You only have three senses. T / (F)

8 **Read. Look at the picture. How are the fish alike? Say with a partner.**

Compare

Scientists say how things are alike. They say how things are different. **Compare** means to say how things are alike and different.

9 **Look at the butterflies. Compare. Say as a class.**

10 Unit 1

ELL Language Support

Help students review the verb *be*. Write *is* and *are* on the board. Say sentences omitting the verb *be* for students to call out *is* or *are*. For example, *This butterfly (beep) blue.* Students should call out *Is! The two butterflies (beep) pretty.* Students should call out *Are!*

Elaborate

Let's compare our fish!

Distribute an Animal Card to each student. Invite students to color their fish. Encourage them to make patterns, e.g., stripes, spots, etc. Finally, put students into small groups to compare their fish. *My fish is big. My fish is blue and yellow. My fish has red spots.* Monitor and provide support as needed.

Think!

Are all fish alike?

Read the question aloud and invite students to answer freely. Guide students to conclude that fish are alike–they are fish–but also different–they can be different sizes, colors, and so on.

Lesson 2

How do scientists observe?

Objective: Learn how scientists group things.

Vocabulary: *group* (v), *group* (n), *fish, butterfly, safety, safe, rules, goggles*

Digital Resources: *Lesson 2 Check* (print out 1 per student)

Materials: vocabulary cards (1 set per group; write the following words on index cards: *balance, ruler, hand lens, scientist, senses, safety, fish, butterfly, frog*), safety goggles (1 per small group)

Build Background Divide the class into groups according to a similarity. For example, you could ask all the boys to stand on one side of the room and all the girls to stand on the other. Have students notice the points of similarity and difference between the groups.

Explain

10 Read. Circle the things that are alike.

Read the paragraph aloud. *We just made groups of (all girls and all boys)!* Turn students' attention to the photos. *What is in the first photo? A fish. What is in the second photo? A fish. What is in the third photo? A butterfly.* Invite students to circle the items that are alike. *Right! They are fish!* Ensure students understand that, by comparing things, we can say if they are alike and put them into groups accordingly.

11 Read. Circle the things that help you stay safe.

Read the paragraph aloud. Invite volunteers to read the labels. Then read the list of rules and guide students to understand them. Remind students that a tool is anything that helps you do something. Divide the class into small groups and distribute safety goggles. Have students take turns putting them on. *What does a ruler do? It helps us tell how long or tall something is. Does it help you stay safe? No! What do safety goggles do? Keep my eyes safe! What else helps you stay safe in science class? Rules!*

Think!

What are some school rules and home rules?

Brainstorm school rules that help students stay safe. Allow students to mime as needed. Accept all logical answers and write them or draw pictures on the board. Do the same with home rules. Then hold a class vote for the most important safety rules. (*Don't run down the stairs. Don't open the windows. Don't push each other.*)

Elaborate

At-Home Lab

Group Objects

Assign the At-Home Lab as homework and have students report in class what objects they put in a group. Encourage students to explain their reasoning.

Card Sort

Divide the class into groups and distribute sets of index cards, mixed up. Challenge groups to sort the cards into groups (e.g., animals, tools, words that start with *s*).

Evaluate

Lesson 2 Check **Assessment for Learning**

Review the Key Words for Lesson 2 (see Student's Book page 8). Distribute the *Lesson 2 Check* and guide students as they complete it. Check answers as a class. Then ask students to grade their progress on the topic of ways scientists observe from 1 to 3: 3 = *I understand ways scientists observe*; 2 = *I need to study more*; 1 = *I need help!* Encourage students giving themselves a 1 or a 2 to say what they found difficult and what they need to study more.

Lesson 3

How do scientists collect and record data?

Objective: Learn how scientists collect and record data.

Vocabulary: *collect, data, record, chart*

Digital Resources: Flash Card (*record*), *I Will Know...* Digital Activity, Animal Cards (1 copy of each of the following: *cricket, firefly, grasshopper, ladybug, mosquito, moth, slug, snail, spider, worm, ant, bee, beetle*)

Materials: per small group: cup with a small amount of water in it, paper towels, tin foil, sponge, pieces of paper

Unlock the Big Question

Write the following on the board: *I will learn how scientists collect and record data.*

Build Background Review the ways scientists observe that students have learned about so far in this lesson. (Answers: *use their senses, use tools, compare, group, follow rules*) Display the *record* Flash Card. Have students brainstorm what they recorded in Lesson 2 with the two apples and the orange. (*The weight of the fruit.*)

Explain

1 Read. What do scientists use to record data? Say as a class.

Read the paragraph aloud for students. *What do scientists collect?* Invite students to give examples of data. (*Information about an animal, e.g., weight, color, abilities,* etc.) Elicit how scientists collect data and draw an example of a chart on the board.

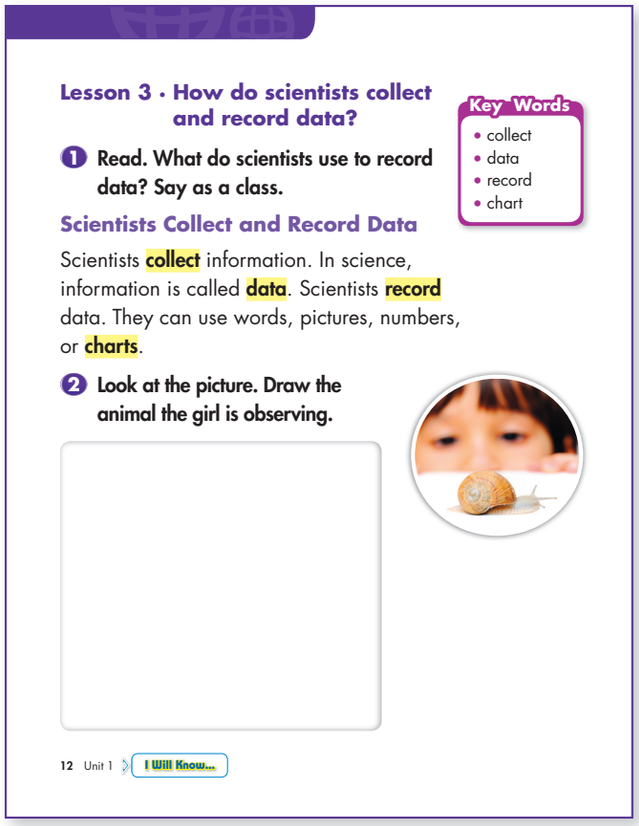
2 Look at the picture. Draw the animal the girl is observing.

Draw students' attention to the picture and elicit the animal. (*snail*) *What do you think the girl is observing? What can she record about the snail?* Accept all logical answers. (Possible answers: *She's observing the color and shape of the snail.*)

Give students time to draw the snail. Invite volunteers to show their drawings to the class.

I Will Know...

Have students do the *I Will Know...* Digital Activity.



Lesson 3 · How do scientists collect and record data?

Key Words
- collect
- data
- record
- chart

1 Read. What do scientists use to record data? Say as a class.

Scientists Collect and Record Data

Scientists **collect** information. In science, information is called **data**. Scientists **record** data. They can use words, pictures, numbers, or **charts**.

2 Look at the picture. Draw the animal the girl is observing.

12 Unit 1 I Will Know...

Elaborate

Flash Lab

Do a Test and Record Data

Divide the class into small groups and distribute materials. *We're going to do a test and record what we find!* Draw a simple chart on the board with the materials and ask students to copy it. *Do paper towels soak up water?* Invite students to say whether they think the answer is *yes* or *no*. Then invite groups to do the test. *Were you right? Yes!* Invite students to mark (✔) or (✘) accordingly on their charts. Ask students to test the other materials and record the information. Check answers as a class.

Observe!

Display the Animal Cards around the class. Ask students to walk around the class in pairs and observe the animals one at a time. Encourage students to discuss what they find interesting about each animal. Monitor and provide support as necessary.

Ask students to sit down in pairs and decide which two animals they want to learn about more. When they're ready, ask students to look at the two animals again. Have students ask questions and discuss similarities and differences. Provide vocabulary as necessary.

Lesson 3

How do scientists collect and record data?

Objective: Learn how scientists collect and record data.

Vocabulary: *collect, record, data*

Digital Resources: Flash Card (*record*), *Lesson 3 Check* (print out 1 per student), *Got it? 60-Second Video*

Build Background Write students' names on the board. Check attendance, and write (✔) beside each student who is present and (✘) beside those who are not. Explain that you collect information about who is at school and record that information. Tell students they will learn about how scientists collect and record data in today's lesson.

Explain

3 Read. What can a mark in a chart show? Say with a partner.

Read the paragraph aloud for students. Have students say how scientists collect data and what a mark in a chart can mean. Ask them to think about the Flash Lab test and what the marks meant in their charts. (*Whether the material soaks up water.*)

4 Ask five friends, "Do you like dogs, cats, or birds best?" Mark (✔) each answer in the chart.

Focus students' attention on the pictures of the animals and have them say the names. Then read the question aloud and invite students to answer. As they do so, demonstrate putting marks in the chart.

Then give students time to work in groups asking each other the question and adding marks.

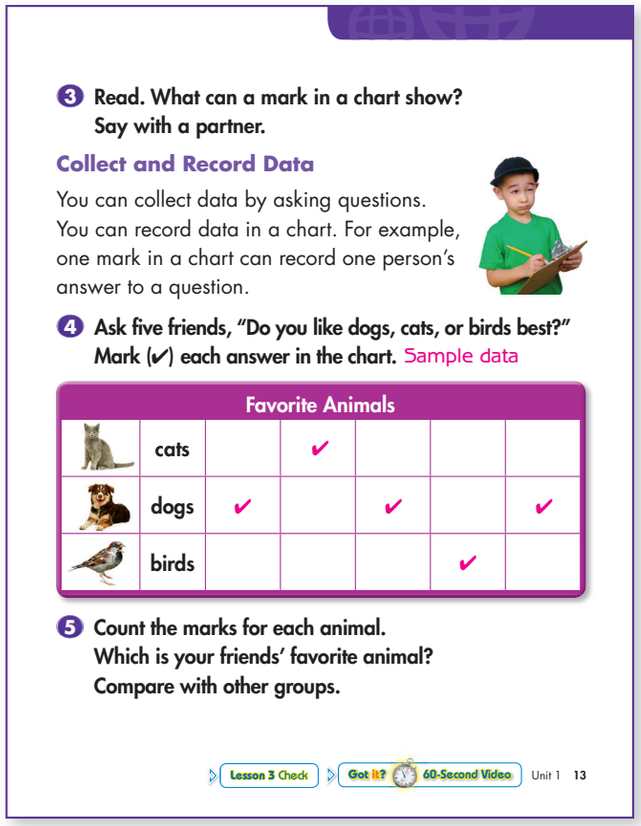
5 Count the marks for each animal. Which is your friends' favorite animal? Compare with other groups.

When they finish, ask students in their groups to look at the marks and say their group's favorite animal. Ask them to share the information in class and explain why they like each animal.

Think!

What do scientists do?

Elicit from students some things that people do in science. (Possible answers: *ask questions, find answers, test ideas, use their senses to observe,* etc.) Read each item and ask volunteers to tell about times when they have done those things. Put a check mark next to the item. Help students understand that, in science, people work together to find answers to their questions. They look for answers by doing tests, observing, measuring, and recording information.



3 Read. What can a mark in a chart show? Say with a partner.

Collect and Record Data

You can collect data by asking questions. You can record data in a chart. For example, one mark in a chart can record one person's answer to a question.

4 Ask five friends, "Do you like dogs, cats, or birds best?" Mark (✔) each answer in the chart. Sample data

Favorite Animals						
	cats		✔			
	dogs	✔		✔		✔
	birds				✔	

5 Count the marks for each animal. Which is your friends' favorite animal? Compare with other groups.

Lesson 3 Check | Got it? 60-Second Video | Unit 1 13

Evaluate

Lesson 3 Check **Assessment for Learning**

Review the Key Words for Lesson 3 (see Student's Book page 12). Distribute the *Lesson 3 Check* and guide students as they complete it. Check answers as a class. Then ask students to grade their progress on the topic of how scientists collect, record, and share data from 1 to 3: 3 = *I understand how scientists collect, record, and share data*; 2 = *I need to study more*; 1 = *I need help!* Encourage students giving themselves a 1 or a 2 to say what they found difficult and what they need to study more.

Got it? 60-Second Video

Play the *Got it? 60-Second Video* to review the unit material.

Let's Investigate!

In this unit, students learn some ways scientists observe. In this lab, they will investigate how adding water can change how we see objects through a viewer.

Let's Investigate! Lab **How do things look?**

Objective: Students will observe how water can change how things appear in a viewer.

Materials: one set per group: viewers, one with water, various objects, for example, a colored pencil, a shell, a plastic animal, a crayon

Digital Resources: *Let's Investigate!* Digital Lab, *Let's Investigate! Activity Card* (1 per student)

Advance Preparation: Prepare two viewers per group: cut two 10 cm holes in either side of empty paper paint buckets. Secure plastic wrap over the top of each with a rubber band. Pour some water on top of the plastic wrap of one of the viewers for each group. You may wish to wait until you've set up stations for groups to make the viewers with water.

- Explain that students will view some objects through the viewer without water. Then they will look at the same objects through the viewer with water and compare how the objects look.
- Divide the class into groups and distribute materials. Have students look at the first item through the viewer without water. Provide ample time for each student to look at the object in the viewer.
- Then invite students to look at the same object through the viewer with water. *How does the water change what you see?* Elicit that the water makes the object look bigger.
- *How is the viewer with water like a hand lens? It makes objects look bigger, too.*
- Have students complete the *Activity Card*.

Teacher Time-Saving Option: Show the *Let's Investigate!* Digital Lab as an alternative to the hands-on lab activity.

Class Project: Safe Science Collage

Materials: art supplies

Brainstorm with students a list of rules and tools that will help them stay safe in science class. Allow students to mime if they wish. Accept all logical answers and provide vocabulary support as necessary. Write a list on the board. (*Listen to the teacher. Be careful with tools. Wear safety goggles. Wash your hands.*) Then distribute art supplies and have students draw themselves following one of the rules or engaging in another safe practice in science class. Invite volunteers to share their drawings. Make a science safety collage and display it in the classroom.

Unlock the Big Question

Have students refer to the Big Question on the Unit Opener page. In pairs have them recall what they have learned about what scientists do. Have pairs complete questions 4 and 5 on the *Activity Card*.

Unit 1 Review

What is science?

Digital Resources: Print out 1 of each per student: *Got it? Self Assessment, Got it? Quiz*

Evaluate

Strategies for Targeted Review

The following are strategies for providing targeted review for students if they encounter challenges with the content.

Lesson 1 What questions do scientists ask?

Question 1

If… students are having difficulty answering the questions, then… direct students to review Lesson 1.

Lesson 2 How do scientists observe?

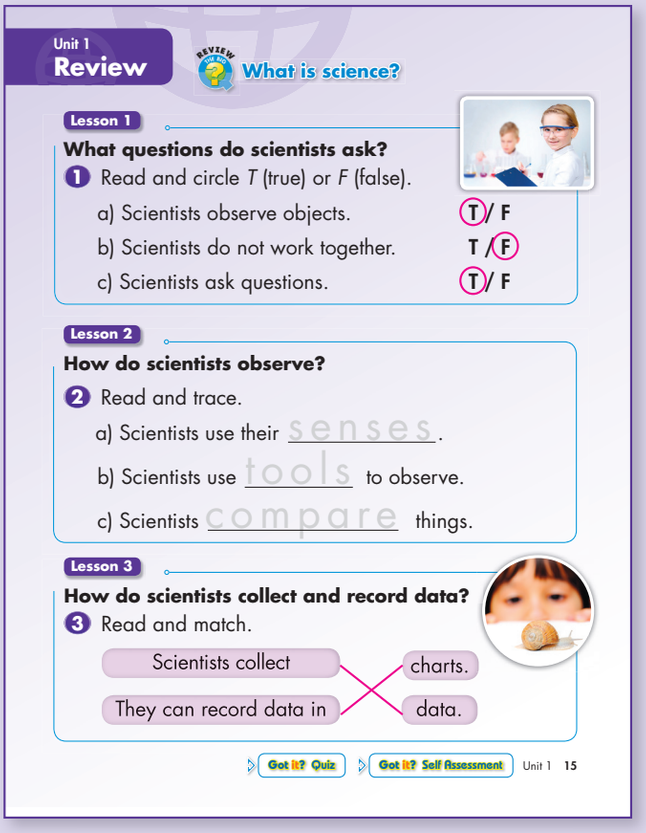
Question 2

If… students are having difficulty tracing the words, then… ask them to trace them slowly and help them with specific letters they find difficult to trace.

Lesson 3 How do scientists collect and record data?

Question 3

If… students are having difficulty matching, then… make a list as a class of things scientists do: *ask questions, find answers, test ideas, learn new things, use their senses to observe, use tools, record data, share what they learn, follow rules.* Then have students match the answers.


Unit 1 Review

What is science?

Lesson 1

What questions do scientists ask?

1 Read and circle *T* (true) or *F* (false).

a) Scientists observe objects. T / F

b) Scientists do not work together. T / F

c) Scientists ask questions. T / F

Lesson 2

How do scientists observe?

2 Read and trace.

a) Scientists use their senses.

b) Scientists use tools to observe.

c) Scientists compare things.

Lesson 3

How do scientists collect and record data?

3 Read and match.

Scientists collect — charts.

They can record data in — data.

Got it? Quiz | Got it? Self Assessment | Unit 1 15

ELL Language Support

Before students start working on the Review activities, have them read each question aloud along with you.

Got it? Self Assessment

Immediately after students have completed the Review activities, distribute a *Got it? Self Assessment* to each student. Have students complete the *Stop! Wait!* and *Go!* statements for each lesson, allowing them to look back through the lesson material if necessary.

Got it? Quiz

Distribute a Unit 1 *Got it? Quiz* to each student. Quizzes may be used for assessing students' understanding of unit concepts as well as for grading purposes.

Unit 1

Lesson 1 Check

Name _____ Date _____

Words to Know

Read and trace.

1. observe to find out about things.
2. question what you ask to find answers.

Explain

3. What are some things you can observe? Trace.

   size color

4. What are some questions you can ask? Trace.

   What is it? Where is it?

Apply Concepts

5. Draw something you can observe in the class.

Unit 1

Lesson 2 Check

Name _____ Date _____

Words to Know

Complete the sentences. Trace.

senses	tools

1. Scientists use their five senses to observe.
2. They use tools to observe and help them do things.

Explain

Circle the correct word.

3. You can use a **hand lens** / **ruler** to tell how long something is.
4. You can use a **balance** / **ruler** to tell how much something weighs.

Apply Concepts

5. Draw two things that can be in a group.

Unit 1

Lesson 3 Check

Name _____ Date _____

Words to Know

Read and trace.

1. Data = information you collect.
2. Record = to write down or draw.

Explain

3. Circle *T* (true) or *F* (false).

   You can collect data by asking questions. **T** / **F**

   You cannot record data in a chart. **T** / **F**

   Scientists record data. **T** / **F**

4. Circle the way scientists can record data.

   A use pictures

   B use a desk

   C use food

Apply Concepts

5. What you can record in this chart? Circle.

Favorite Color / Animal / Toy				
Red				
Blue				
Yellow				

Unit 1

Lesson 1 Let's Explore! Activity Card

Name _____ Date _____

Materials

Per small group or pairs:

- shell
- wooden block
- feather
- patterned paper
- rock
- bean seed
- hand lens

How do we observe?

1. Look.
2. Tell three things.
3. Repeat.
4. Draw.

Let's Investigate! Activity Card

Name _____ Date _____

Analyze and Conclude

4. Read and circle.
How does the viewer help you observe things?

It makes things look **smaller**/**bigger**.

5. Pick one object you observed. Draw how it looks with water. Draw how it looks without water.

With Water	Without Water

Lessons 1–3 Got it? Self Assessment

Name _____ Date _____

Got it? Self Assessment

Complete the statements for each lesson.

Lesson 1 What questions do scientists ask?

Stop! I need help with _____

Wait! I have a question about _____

Go! Now I know _____

Lesson 2 How do scientists observe?

Stop! I need help with _____

Wait! I have a question about _____

Go! Now I know _____

Lesson 3 How do scientists collect and record data?

Stop! I need help with _____

Wait! I have a question about _____

Go! Now I know _____

Got it? Quiz

Name _____ Date _____

Got it? Quiz

1. Why do scientists observe things? Circle.
A to find out what they like
B to find out about the world around us
C to find out what good people do

2. Circle the science questions you can ask about a frog.
A How much does it cost?
B What is a story about a frog?
C Where does it live?

3. Circle what you can use a ruler for.
A to measure how much
B to measure how long
C to see something

4. Circle the best answer. When you compare, you say how things are _____.
A alike
B alike and different
C different

Got it? Quiz

Name _____ Date _____

5. Circle the tool.
A a question
B a hand lens
C a frog

6. Circle what keeps you safe in science class.
A a ruler
B a hand lens
C safety goggles

7. Circle the sense.
A write
B draw
C touch

8. Where can you record data?
A in a chart
B in a list of rules
C in a tool

Unit 1 Study Guide

What is science?

Lesson 1

What questions do scientists ask?

- Scientists use science to learn about the world around us.
- Scientists observe and ask questions.

Lesson 2

How do scientists observe?

- Scientists use the five senses and tools.
- They compare things. They group things. They follow rules.

Lesson 3

How do scientists collect and record data?

- Scientists can use words, pictures, numbers, and charts to record data.

Review the Big Question

What is science?

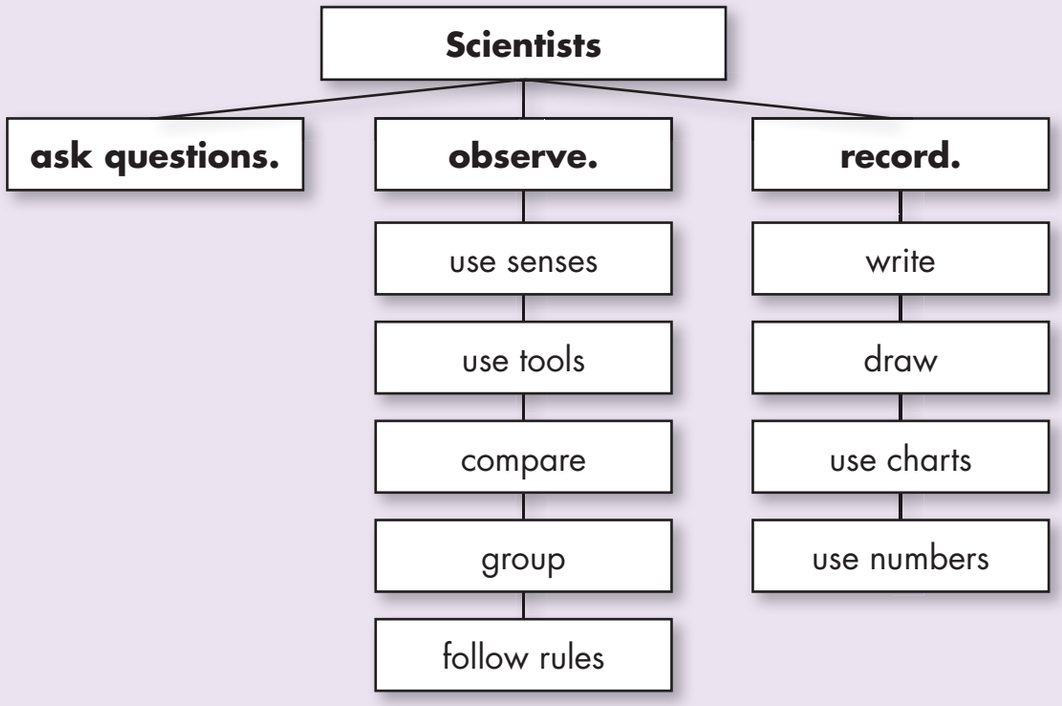
Have students use what they have learned from the unit to answer the question in their own words.

How has your answer to the Big Question changed since the beginning of the unit? What are some things you learned that caused your answer to change?

Make a Concept Map

Draw on the board a concept map like the one shown on this page. With the students, talk through the key ideas from this unit. Invite different students to point to the ideas on the board, miming as possible.

Unit 1 Concept Map



Students can make a concept map to help review the Big Question.

Teacher's Notes