

Unit 1

The Nature of Science



What is science?

I will learn

- how to use science skills.
- why scientists repeat investigations.
- how to record and show data.

1 Look and label the five senses. Then name the five sense organs.

smell hearing touch sight taste



2 Look at the picture and circle *T* (true) or *F* (false).



- | | |
|---------------------------------------|-------|
| 1. The trees produce a lot of apples. | T / F |
| 2. Many of the apples are ripe. | T / F |
| 3. The trees are not healthy. | T / F |
| 4. It is winter. | T / F |

3 With the class, say which senses you can use to decide if each statement in activity 2 is true or false.

Think!
What makes this boy a scientist?



Lesson 1 • What kinds of skills do scientists use?

Key Words

- senses
- experiment
- results
- observe
- predict

1 Read and complete the statements.

Different Ways to Learn

Scientists learn about the world around them. They use their **senses**.

Scientists do **experiments** to learn. They carry out experiments again and again to make sure they get the same **results**.

Scientists learn from each other, too. They ask each other, "How do you know?" and share what they learn. They give answers. They tell how they know.

experiments each other senses



Scientists carry out



Scientists use their



Scientists learn from

2 Read and match the questions with their answers.

1. Why do scientists repeat their experiments?

2. Why do scientists use their senses?

3. Why do scientists share what they learn?

To help answer each other's questions.

To make sure the results are the same.

To learn about the world around them.

3 Read, look, and mark (✓) the ripe apples. Then answer the questions.

Observe

Scientists observe to find out about the world. You **observe** when you use your senses to find out about something. We have five senses: smell, hearing, touch, sight, and taste. We use a different part of our body for each sense. We use our nose for smell, our ears for hearing, our hands or fingers for touch, our eyes for sight, and our tongue for taste.

How do you know when an apple is ripe? You might look at the color. Some people tap it to hear how it sounds. You might feel it and smell it, too. You will know if it is ripe when you taste it!



1. Give a reason for your choice.

2. What sense or senses did you use to make your decision?

4 How do you know this apple tree is healthy? Read, look, and say with a partner.

Predict

Scientists use what they observe to predict. You **predict** when you tell what you think will happen.

How might scientists predict how many apples will grow? They can think about how many apples grew the year before.



5 Read and underline four ways to classify apples.

Classify

Scientists classify, or put things in groups. Scientists might classify kinds of apples by taste, shape, and color. There are many different kinds of apples. How do you know what kinds of apples are the smallest? You might group apples by size.

6 Are red apples as sweet as green apples?
How do you know? Read and say with a partner.



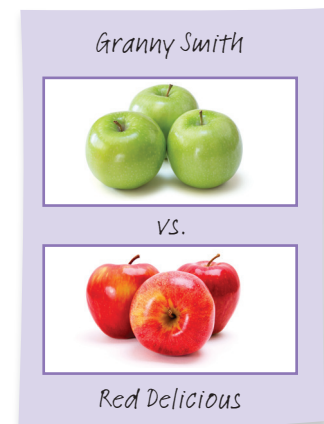
Compare and Contrast

Scientists compare and contrast what they observe, too. They tell what is the same. They tell what is different.

7 With a partner, select two different types of apples. Draw and label them. Then compare them using your senses and circle the answer.



vs.



Apple A: _____

Apple B: _____

1. Apple **A** / **B** is sweeter.

3. Apple **A** / **B** is harder.

2. Apple **A** / **B** is heavier.

4. Apple **A** / **B** has a stronger smell.

▶ Lesson 1 Check

▶ Got it?  60-Second Video

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Lesson 2 • How do scientists find answers?

1 Read. Then order the steps for carrying out investigations.

Key Words

- investigate
- conclusion
- height
- measurement
- hypothesis

Repeat Investigations

Scientists learn about the world around them. First, they ask questions. Then they investigate. You **investigate** when you look for answers.

Scientists repeat investigations before they draw conclusions. A **conclusion** is what you decide after you think about all you know. You should be able to draw similar conclusions when you repeat an investigation.

For example, one scientist measures the **height** of the tallest tree in a forest. Others repeat the **measurement**. They get similar answers. They draw a conclusion.

investigate

ask questions

draw conclusions

repeat investigations

2 What do you think the scientist in this picture is studying? Why? Look and talk about the question with the class.



Scientists draw conclusions from what they learn when they investigate.

3 Read, look, and follow the instructions.

1. Circle the question.
2. Underline the hypothesis.
3. Label the pots *water* and *no water*.

Scientific Methods

Scientific methods are ways of finding answers. Scientists use scientific methods when they do experiments. Scientific methods can have these steps. Sometimes scientists do the steps in a different order. Scientists do not always do all of the steps.

Ask a question.

Ask a question that you want answered.



Do seeds need water to grow?

Make a hypothesis.

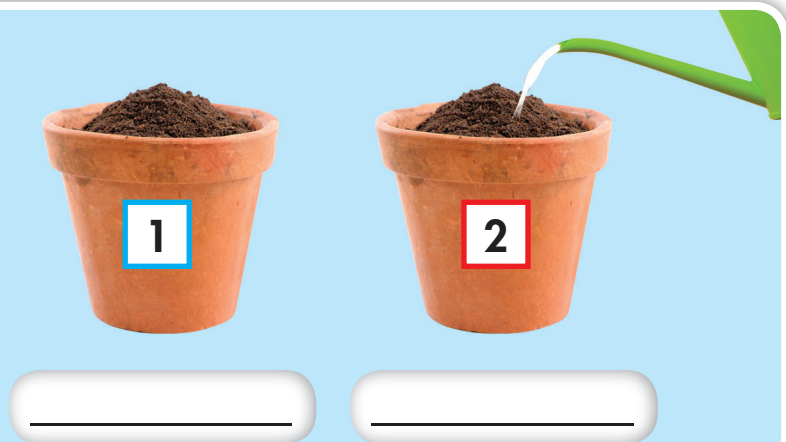
A **hypothesis** is a possible answer to your question.



The seeds that are watered will grow because seeds need water.

Plan a fair test.

Change only one thing. Keep everything else the same. Record your steps. Someone else should get the same answer if they follow your steps.



4 Read and match the headings with the corresponding information.

Do your test.

Collect and record your data.

Tell your conclusion.

Think about the results of your test. Decide if your hypothesis is supported or not supported. Tell what you decide.

Test your hypothesis. Repeat your test. See if your results are the same.

Keep records of what you observe. Use words, numbers, or drawings to help.

5 Look and draw what you think happened to the seedlings.



no water



water

Think!

If someone else follows the steps of this investigation and gets a different result, what might you conclude?



Lesson 3 • How do scientists collect and share data?

Key Words

- data
- granite
- basalt
- pumice

1 Look and circle the words that describe the rocks.



rough

smooth

sharp

rounded

jagged

large

small

tall

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

Collect Data

Scientists collect data to learn new things. **Data** is what you observe with your senses. Scientists record what they observe and measure. Scientists make conclusions from data and from what they already know.

1. Scientists collect data using their senses. T / F
2. Scientists use data to make conclusions. T / F
3. Scientists only make conclusions from data. T / F

3 Look at the picture and circle one thing you can conclude about the rocks.

1. The rocks are very light.
2. The rocks are smooth because of the ocean water.
3. Many animals live under the rocks.



Let's Explore! Lab

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4 Read and measure the width of the rocks. Write the data in centimeters.

Record Data

Scientists record what they observe and measure. They look at the data carefully. Scientists can learn new things when they record data.

You can measure how wide each rock is with a ruler. One way to record data is in graphs and charts.

granite



basalt



pumice



At-Home Lab

Observe and Compare

Find three leaves in your neighborhood. Look at them carefully. Compare the shapes and colors. Measure them in inches and centimeters.

- 5 Read and fill in the table for each rock. Use your data from page 12.

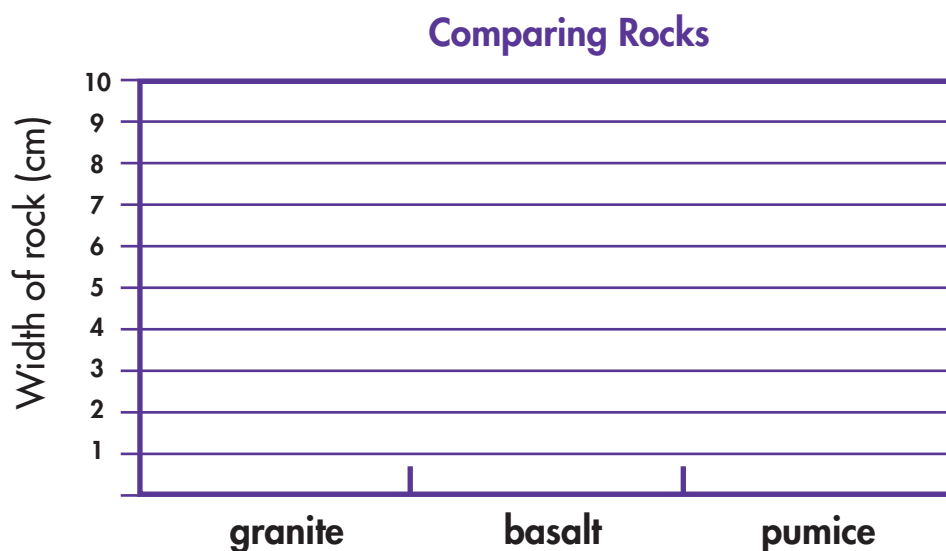
Tables, Charts, and Graphs

Scientists use tables, charts, and graphs to record data. These help scientists to organize data.

Tables show data in rows and columns, while charts and graphs show data graphically. There are many different types of charts and graphs, but they all help scientists make comparisons and find patterns more easily. Sometimes they learn what is the same. Sometimes they learn what is different.

Comparing Rocks	
Rock	Width
Granite	
Basalt	
Pumice	

- 6 Fill in the bar graph for each rock. Then answer the question.



Which rock is the widest? _____



Materials



2 plastic cups
with water



spoon



2 ice cubes



timer



salt

Let's Investigate!

What skills do scientists use?

1. Write *salt water* on one plastic cup and *plain water* on the other, using a marker.
2. Stir 1 spoonful of salt into the salt cup.
3. Put 1 ice cube in each cup. Start the timer.
4. Check the timer when the first ice cube melts. Record your data in the table.
5. Check the timer when the second ice cube melts. Record your data.

Ice Cube Data

	Time to Melt (minutes)
Plain water	
Salt water	



Unit 1 Review



What is science?



Lesson 1

What kinds of skills do scientists use?

1 Circle the correct answer.

You _____ when you use your senses to find out something.

- a) record b) repeat c) observe

Lesson 2

How do scientists find answers?

2 Circle why scientists repeat investigations.

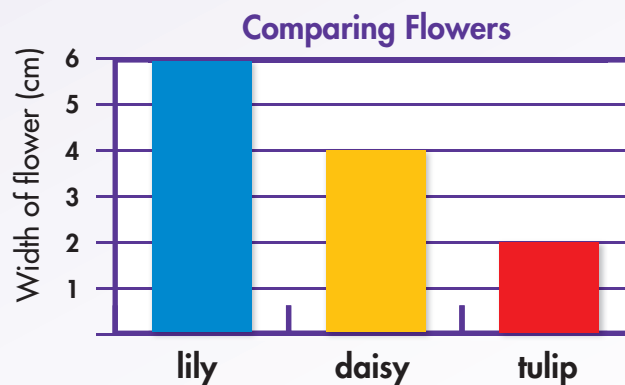
1. To use their senses.
2. To find different answers.
3. To find similar results.



Lesson 3

How do scientists collect and share data?

3 Look at the bar graph and answer the question.



1. Which flower is the widest? _____
2. Which flower is the least wide? _____



Got it? Quiz



Got it? Self Assessment

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