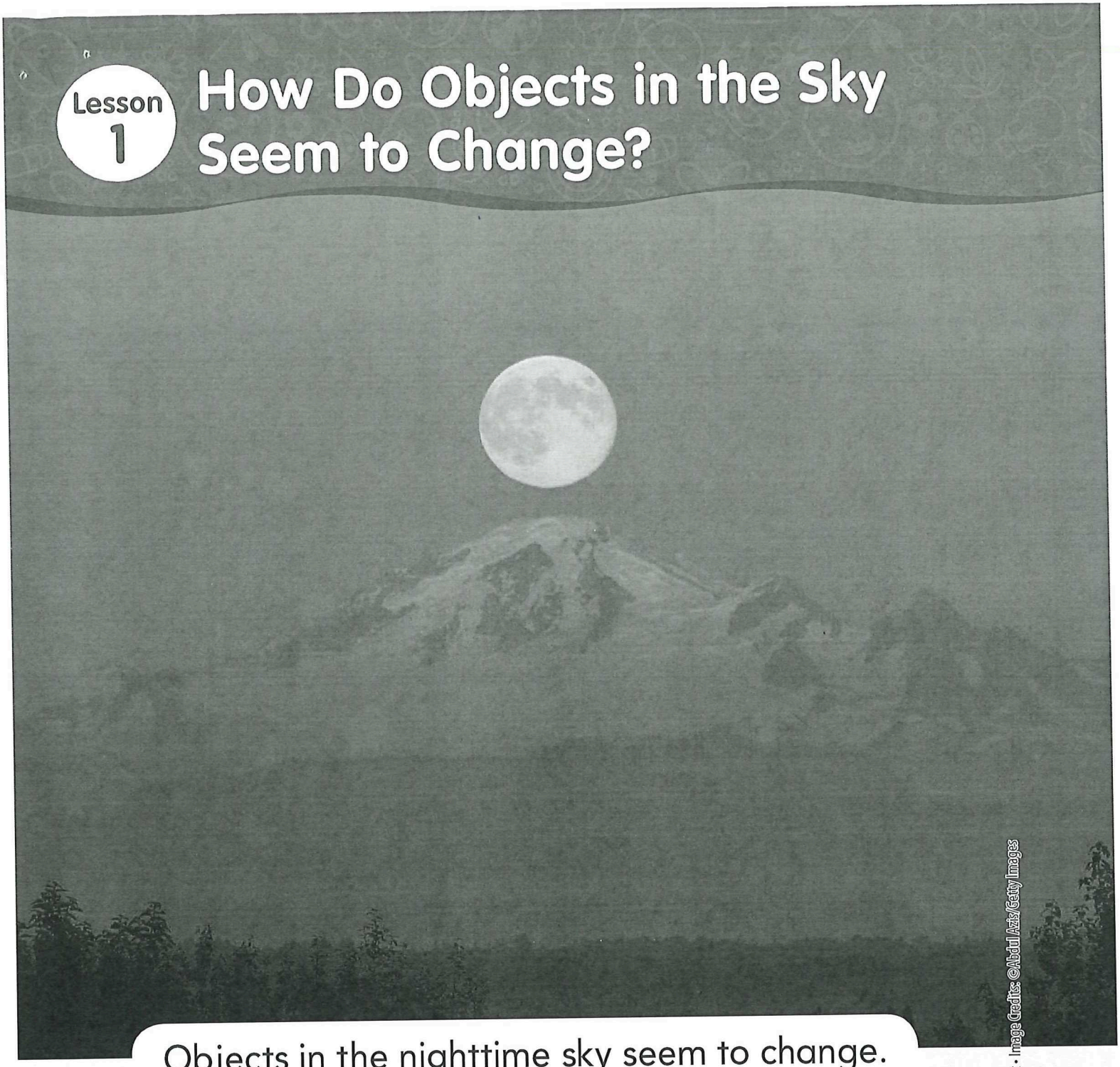
Lesson 1

How Do Objects in the Sky Seem to Change?



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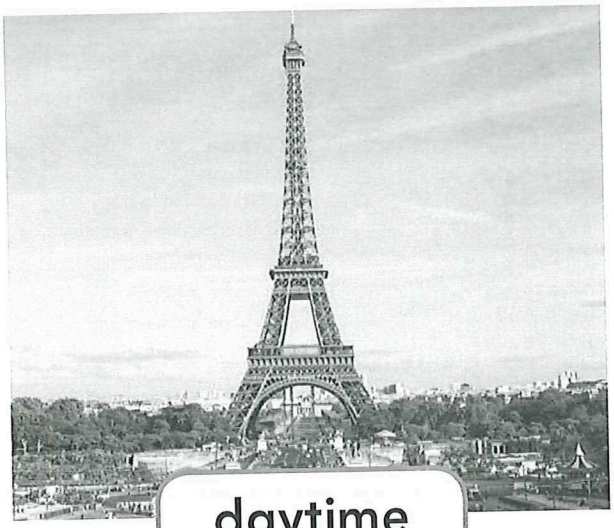
Objects in the nighttime sky seem to change.

By the End of This Lesson

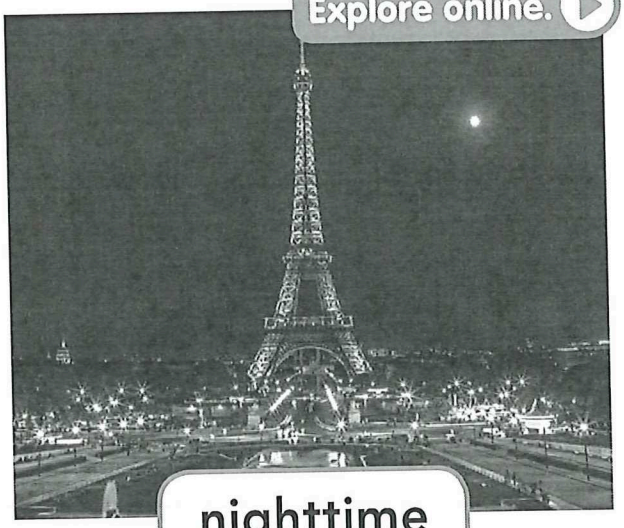
I will be able to describe objects in the sky and predict their patterns.

Objects in the Sky



daytime

Explore online.



nighttime

You can see objects in the daytime sky.

You can see objects in the nighttime sky.

Can You Explain It?

How do objects in the sky seem to change?

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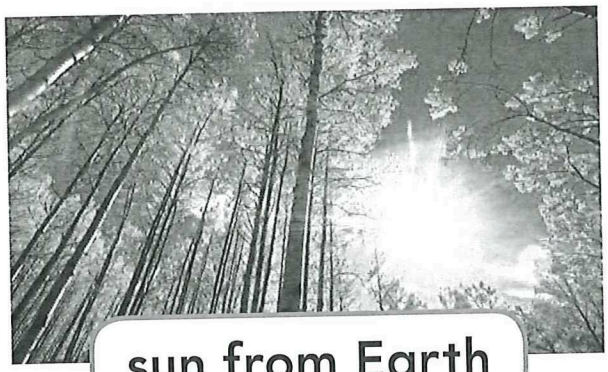
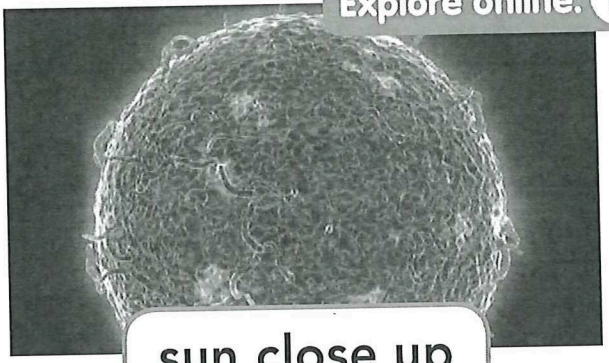
The Daytime Sky



sun from Earth

Explore online.



sun close up

You can see objects in the daytime sky. You may see the sun and sometimes the moon. The sun is a star. A **star** is an object in the sky. It gives off its own light. The **sun** is the star closest to Earth. It is made of hot gases. It gives off light and heat.

Underline two sentences that tell facts about the sun.

Apply What You Know

Evidence Notebook • Work with a partner. Talk about what you know about the sun in the daytime sky. Use evidence to tell how you know. Then write sentences about it in your Evidence Notebook.

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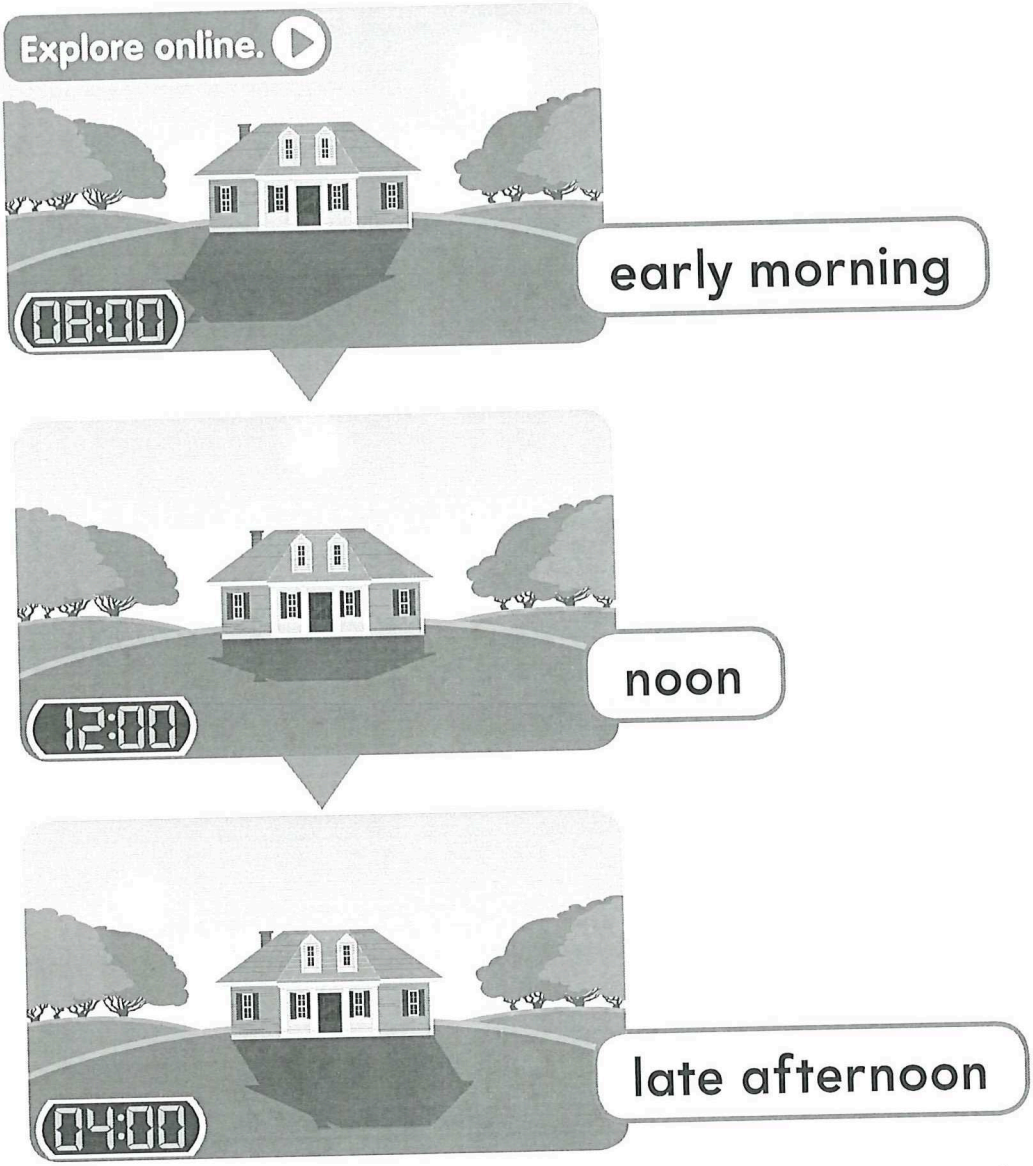
Patterns in the Daytime Sky



Each day, Earth turns all the way around. This makes the sun seem to move across the sky.

In early morning the sun seems low in the sky. At noon the sun seems to be directly above us. By late afternoon it seems to be low again, but on the other side of the sky. This pattern repeats each day.

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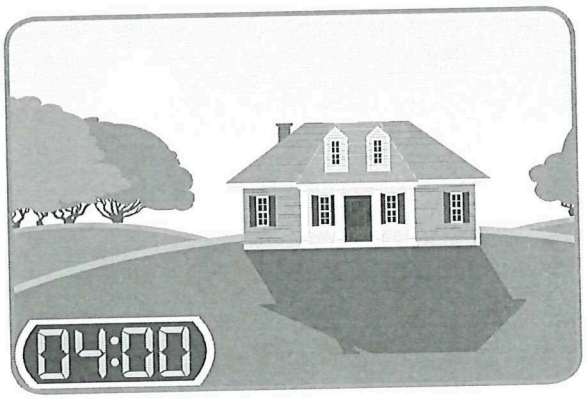
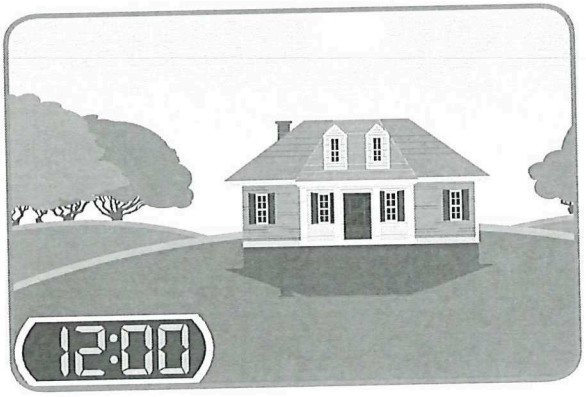
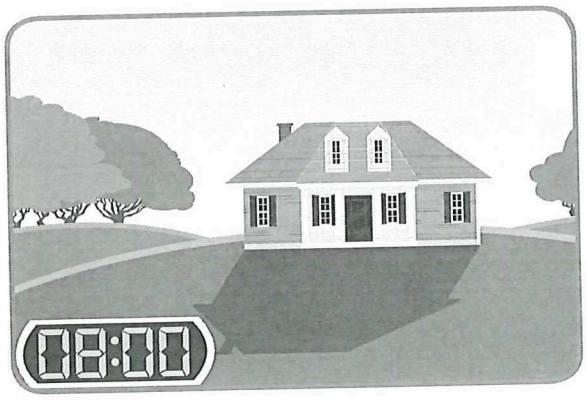
Match each picture to the word or words that describe it.



early morning



noon



late afternoon

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Name _____

Hands-On Activity

Observe the Pattern of the Sun

Materials • drawing paper

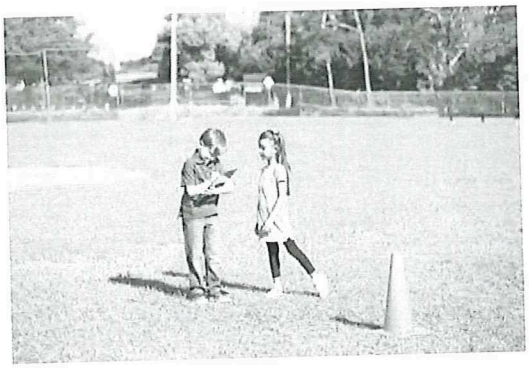
Ask a Question

_____

Test and Record Data

Explore online.

Step 1



Choose a time in the morning. Record the time.

_____

Step 2

Go outside. Draw a picture to record the position of the sun. Be sure not to look directly at the sun.

Step 3

Look for an object that makes a shadow. Draw a picture of the object and its shadow.

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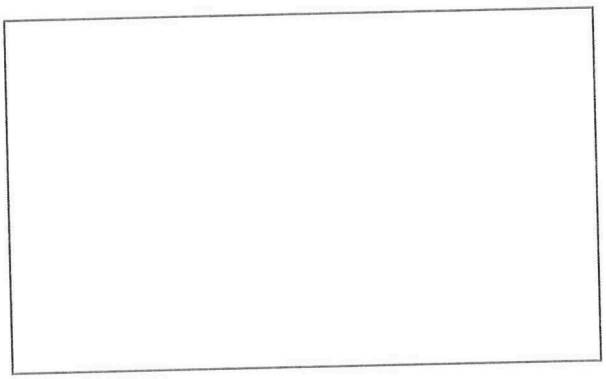
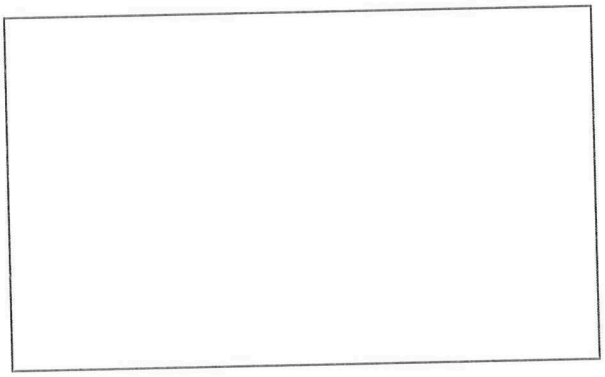
Step 4

Repeat steps 2 and 3 at noon and again in the afternoon. Compare the position of the sun and the shadows at the different times of day.





Step 5

Do the activity again another day.

What patterns do you see?

Make a claim that answers your question.

_____

_____

_____

What is your evidence?

_____

_____

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Read, Write, Share! • Think about what you saw in the activity. Has the sun always seemed to move this way? Look in books or on the Internet to find out more.

Recall Information • Order and Consistency Go to the online handbook for tips.

Record what you think.

Apply What You Know

Work with a partner. Make a model of the sun in the daytime sky. Use your model to explain the pattern of how the sun seems to move.

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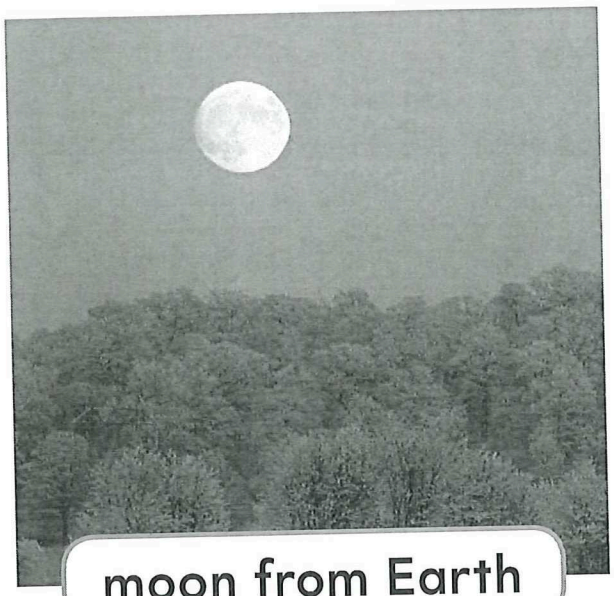
The Nighttime Sky



moon from Earth

moon close up

Night always follows day. On many nights you can see the moon in the sky. The **moon** is a large ball of rock that circles Earth. The moon seems to shine, but the moon does not give off its own light. The moon reflects light from the sun.

Write a fact about the moon.

_____

_____

_____

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Explore online.

On a clear night, you can see many stars. Stars are balls of hot gases. These gases give off light. This light is what you see from Earth. Stars look tiny because they are far away. A telescope can help you see them better. It makes objects look bigger.

Underline the sentence that tells why you can see stars.

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Apply What You Know

Work with a group. Make a picture dictionary about the nighttime sky. List the objects in the nighttime sky. Draw a picture for each object. Write sentences to tell about it.

Patterns in the Nighttime Sky

new moon

Explore online.

first-quarter moon

full moon

third-quarter moon

The shape of the moon seems to change. These changes are called phases. **Phases** are the moon's pattern of light and darkness that you see as the moon moves. The phases repeat each month.

Patterns Go to the online handbook for tips.

Do the Math! • Draw an X on the phase of the moon that looks like a whole circle. Draw a box around the phases that look like half of a circle.

Describe Shares Go to the online handbook for tips.

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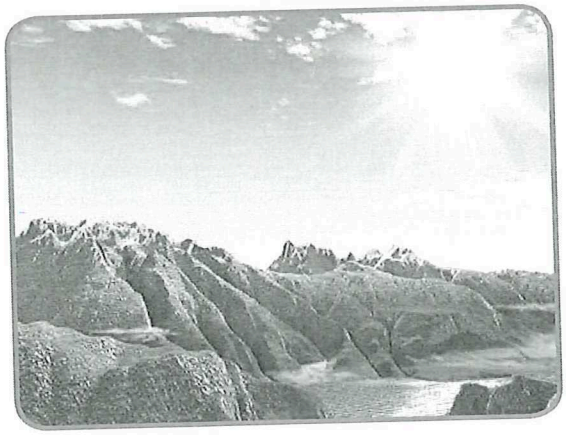
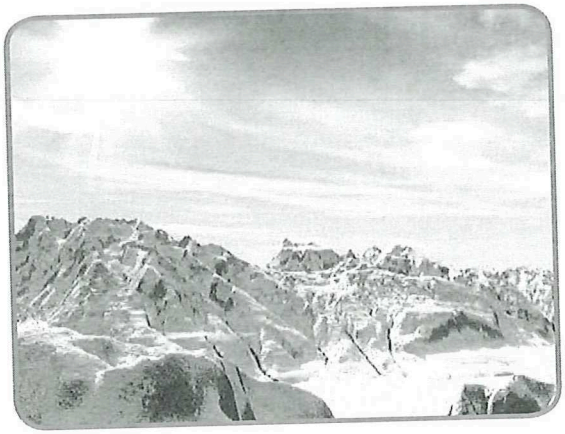
Explore online.



These are stars you can see during the summer.



These are stars you can see during the winter.

The sun is the only star you can see during the day. But the stars you see each night are not always the same. They change with the seasons.

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Which sentences are facts about the patterns of the stars? Choose all correct answers.

Ⓐ The sun is the only star you can see during the day.

Ⓑ The stars at night in the winter are the same as the stars at night in the summer.

Ⓒ You can see different stars at different times of the year.

Apply What You Know

Evidence Notebook • Work with a group. Make a model of the phases of the moon. Use your model to tell about the pattern of phases of the moon. How does the moon seem to change? Use evidence to tell how you know. Record your answers in your Evidence Notebook.

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Take It Further

People in Science & Engineering •

Dr. Sarah Ballard

Explore more online.
Space Technology

Explore online.

Dr. Sarah Ballard is an astronomer. An astronomer studies objects in the sky. Dr. Ballard searches for new planets. A planet is a large object in space that moves around a sun or a star. Earth is a planet.

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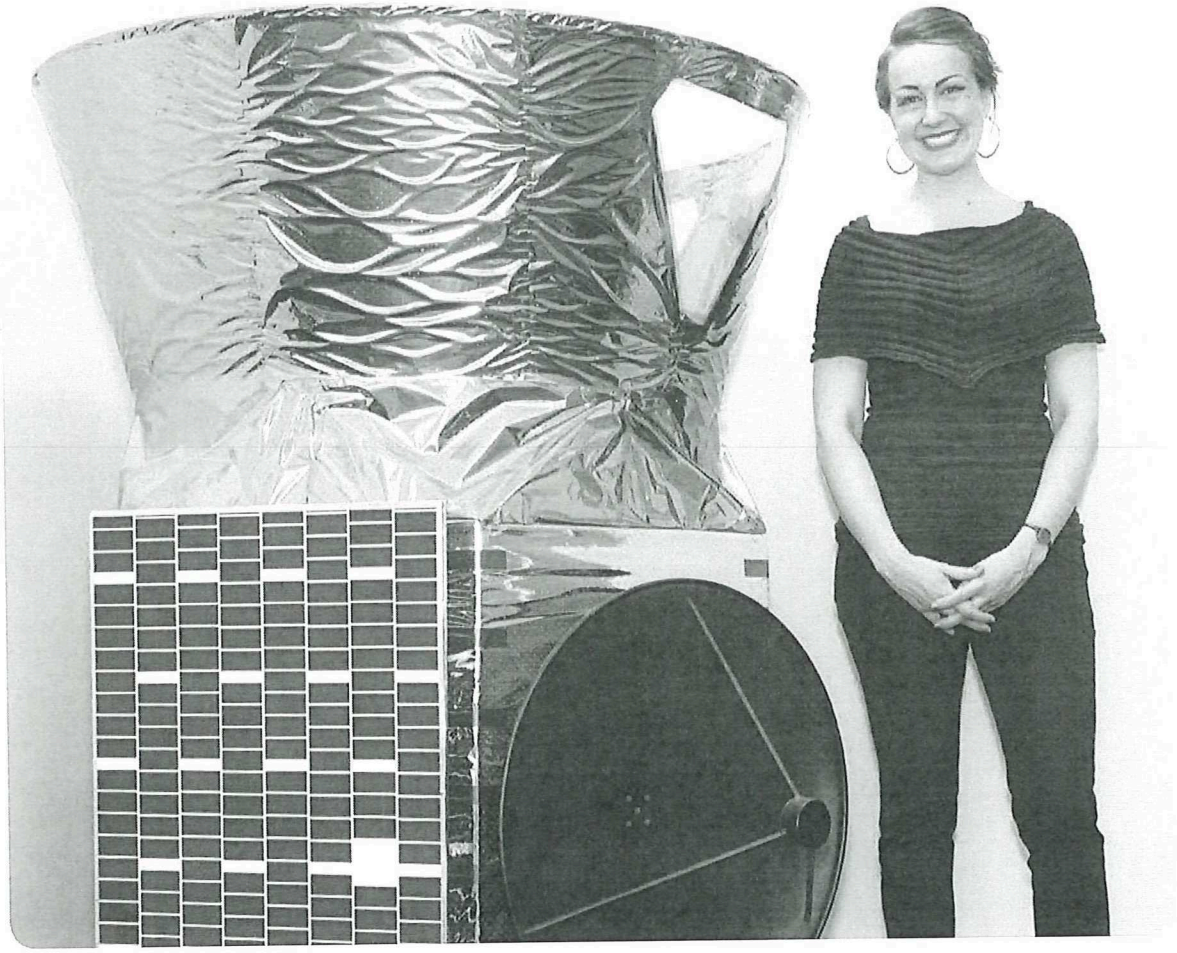
Explore online.

This is a model of a satellite that Dr. Ballard will use.



What do astronomers do? Choose all correct answers.

Ⓐ They study objects in the sky.

Ⓑ They find new planets.

Ⓒ They study animals.

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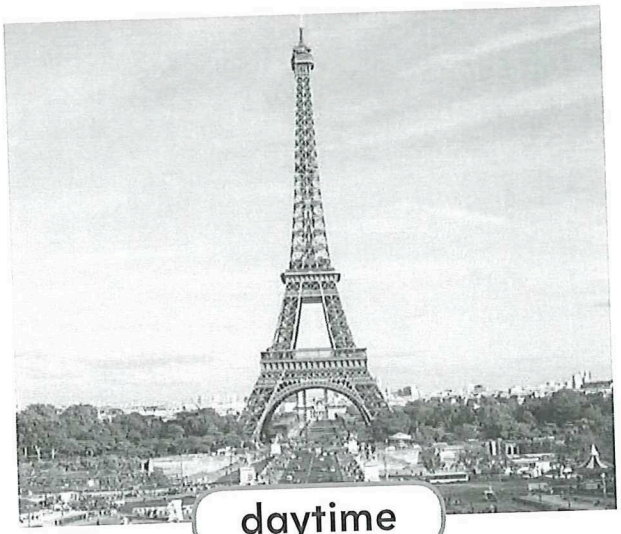
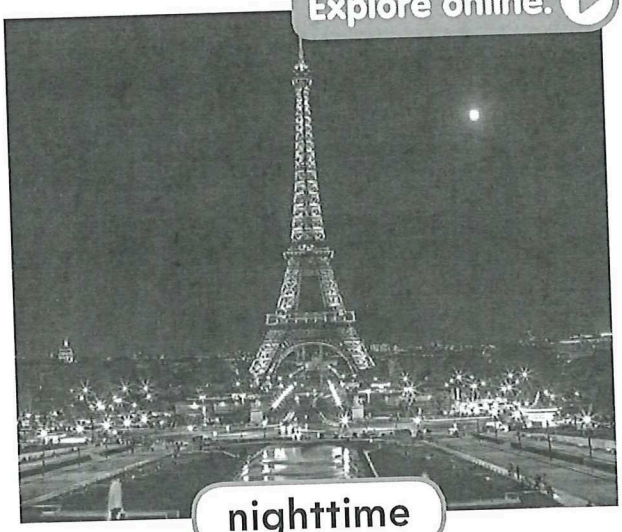
Lesson Check

Name _____



daytime

Explore online.



nighttime

Can You Explain It?

How do objects in the sky seem to change?

Be sure to

- Tell how objects seem to change in the sky.
- Describe the pattern of changes.

_____

_____

_____

_____

_____

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Self Check

1. What causes the sun to seem to move in patterns?

   Ⓐ Earth turns all the way around.

   Ⓑ The sun turns all the way around.

   Ⓒ The moon turns all the way around.

2. What time of day is it in each picture? Write the words from the box to label each picture.

night	late afternoon	noon

_____ _____ _____

3. How many times does the sun seem to rise in one week?

   Ⓐ 1

   Ⓑ 7

   Ⓒ 14

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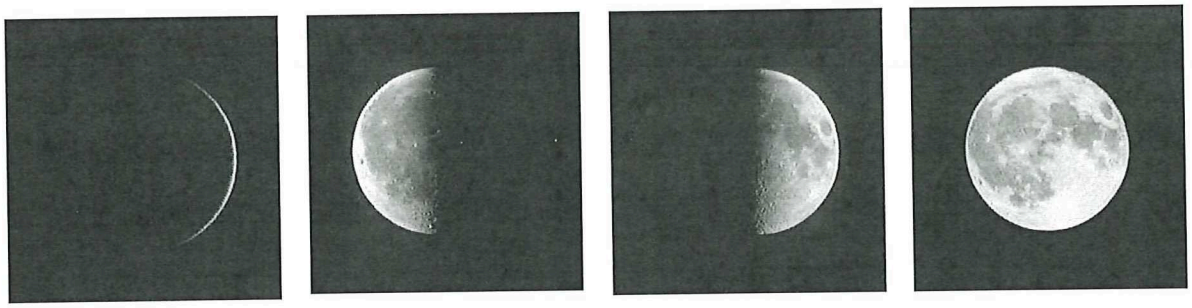
4. What is the moon?

Ⓐ a large star that circles Earth

Ⓑ a large ball of rock that circles Earth

Ⓒ a large ball of rock that blocks light from the sun

5. What are the phases of the moon? Write the numbers to show the correct order. The first one has been done for you.



1 _____ _____ _____

6. What are the patterns of objects in the sky? Choose all correct answers.

Ⓐ The sun seems to move in the daytime sky.

Ⓑ All stars appear in the daytime sky.

Ⓒ The moon seems to change shape during the month.

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