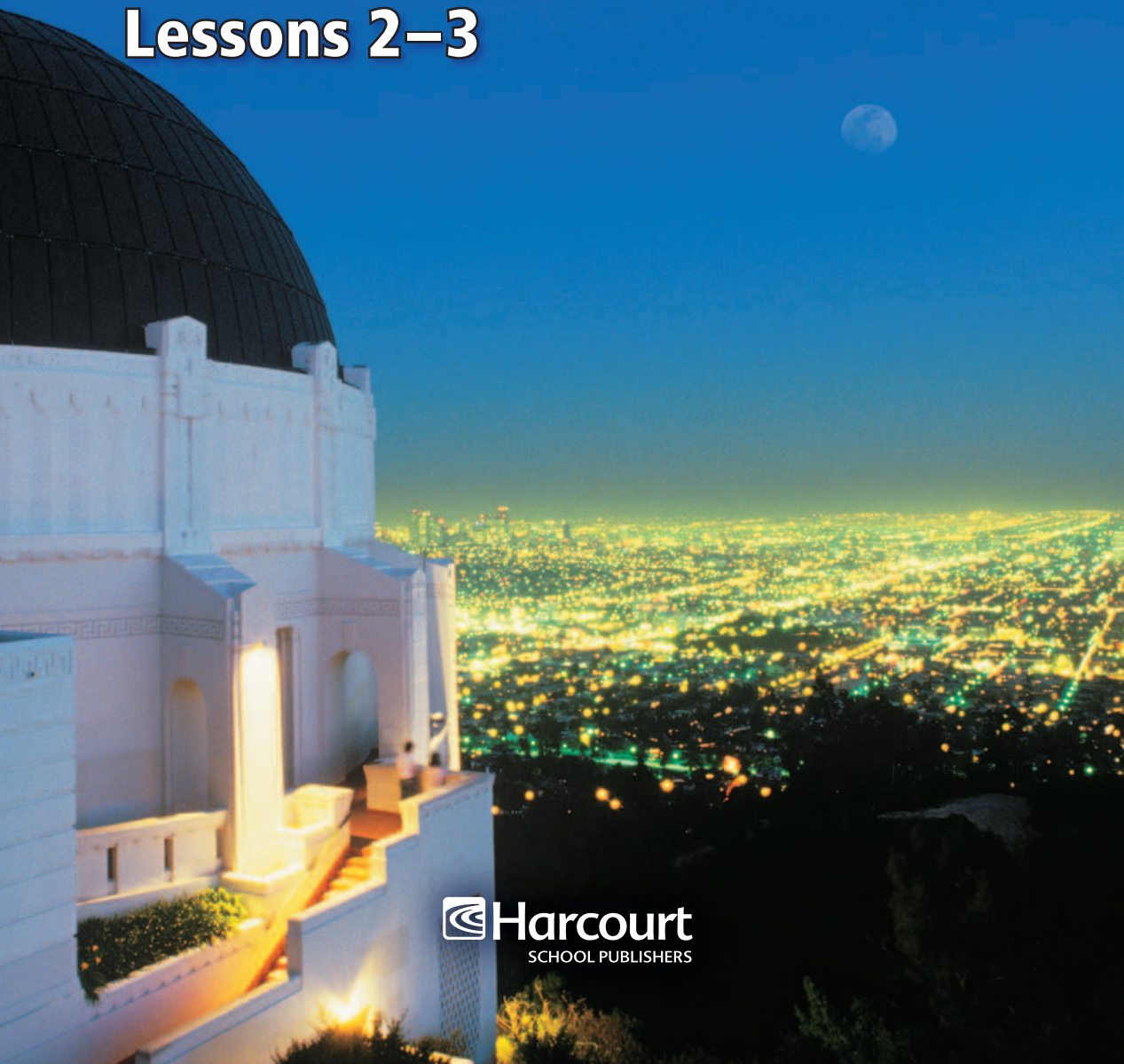




Solar System

Lessons 2–3



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The Solar System

Lessons 2–3

Lesson 2

What Makes Up the Solar System? 2

Lesson 3

What Holds the Moon and Planets in Place? 8

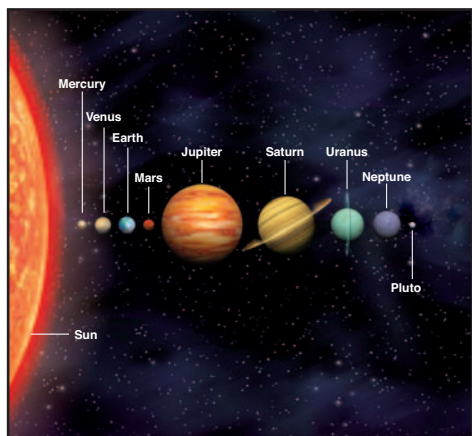


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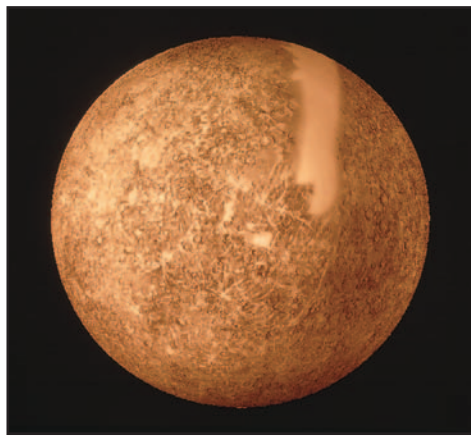
What Makes Up the Solar System?

VOCABULARY

- solar system
- planet
- satellite
- asteroid
- comet



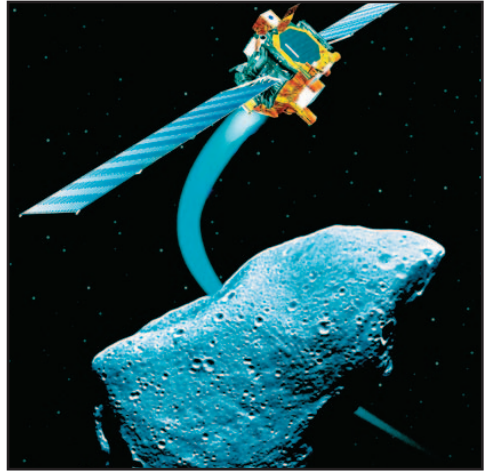
- Our **solar system** includes nine planets. They revolve around the sun.



- Earth is a **planet**. It is a body that revolves around a star.



A **satellite** revolves around Earth. They can be artificial or natural.



An **asteroid** can leave craters when it hits Earth.



A **comet** can have a tail millions of kilometers long.

READING FOCUS SKILL

MAIN IDEA AND DETAILS

The **main idea** is what the text is mostly about.

Details are pieces of information about the **main idea**.

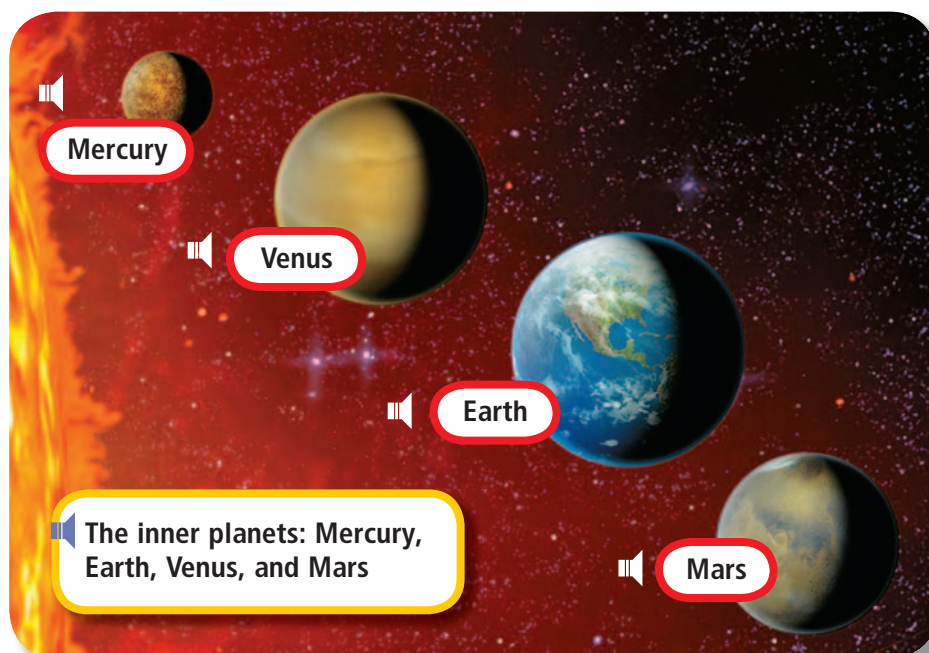
Look for **details** about the inner and outer planets.

The Inner Planets

A solar system is made up of a star and the objects that revolve around it. These objects can be planets, satellites, or other objects. A **planet** is a body that revolves around a star. A **satellite** is a body that revolves around a planet.

Our solar system includes nine planets. There are four inner planets. The inner planets are Mercury, Earth, Venus, and Mars. They are all rocky and dense.

What is one detail about the inner planets?





The Outer Planets

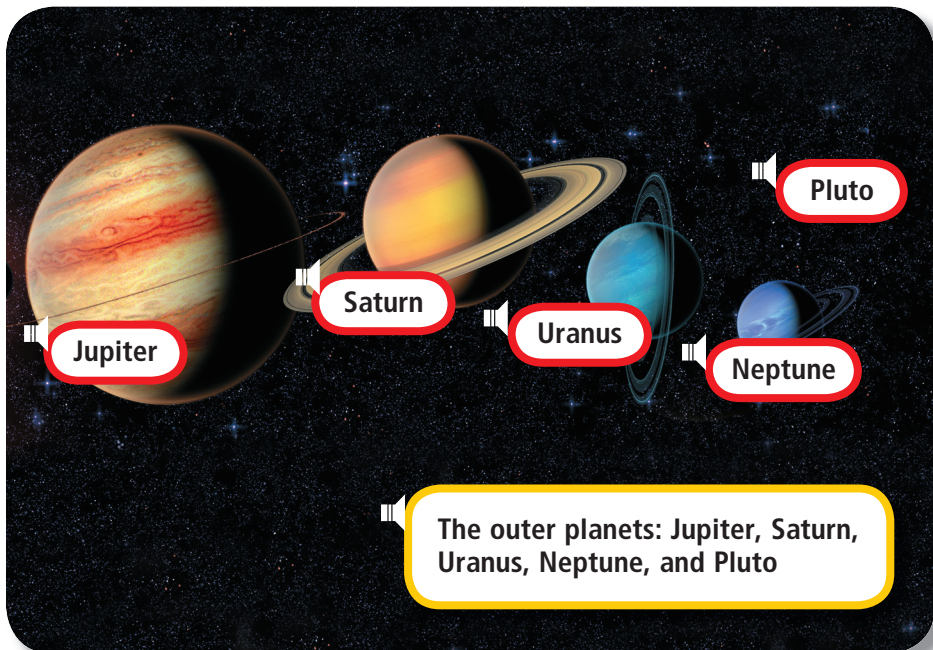
Beyond the inner planets are the five outer planets. In order from the sun, they are Jupiter, Saturn, Uranus, Neptune, and Pluto.



Jupiter is the largest planet. Saturn is best known for its rings. Uranus has many moons and rings. Neptune has the strongest winds in the solar system. Pluto is small and rocky.*



What is one detail about the outer planets?



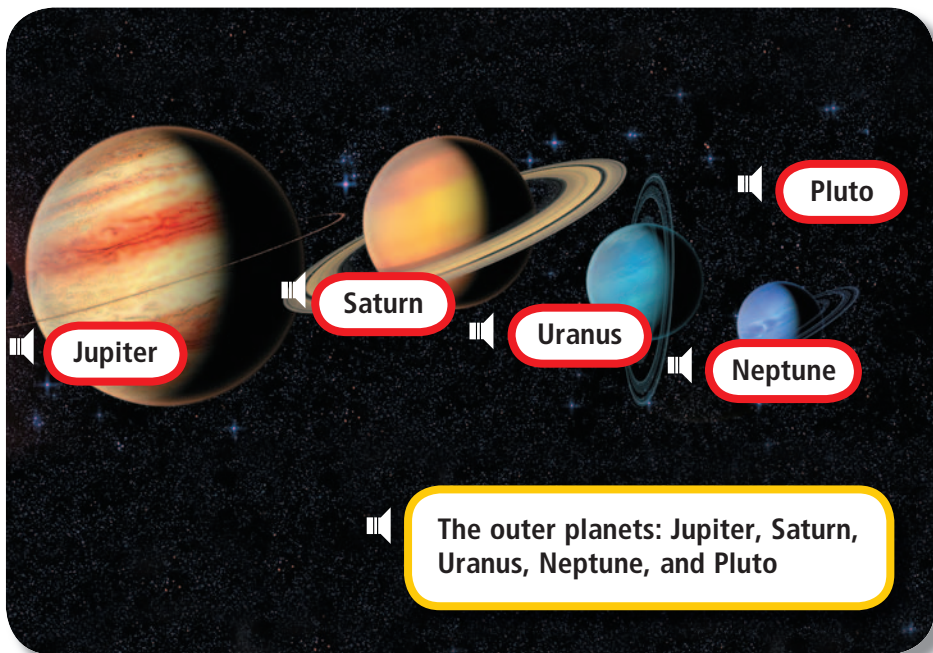
*In 2006, the International Astronomical Union defined a planet as a body that orbits the sun, is spherical, and is large enough to clear its orbit. They reclassified Pluto as a “dwarf planet,” because it is not large enough to clear its orbit.

The Outer Planets

Beyond the inner planets are the five outer planets. In order from the sun, they are Jupiter, Saturn, Uranus, Neptune, and Pluto.

 Jupiter is the largest planet. Saturn is best known for its rings. Uranus has many moons and rings. Neptune has the strongest winds in the solar system. Pluto is small and rocky.

  What is one detail about the outer planets?





What are comets made of?

Asteroids and Comets

Asteroids are chunks of rock too small to be called planets. Asteroids are located in the area between Mars and Jupiter. They make up the *asteroid belt*.

 *Meteors* are other small pieces of rock that travel through space. When meteors hit Earth's atmosphere, they usually burn up.

 A **comet** is a ball of ice, rock, and frozen gases that orbits the sun. A comet may pass close to the sun and then swing out to the edge of the solar system.

  What is one detail about asteroids?



Review



Complete this **main idea** statement.

- 1. A _____ is made up of a star and all the planets and other objects that revolve around that star.

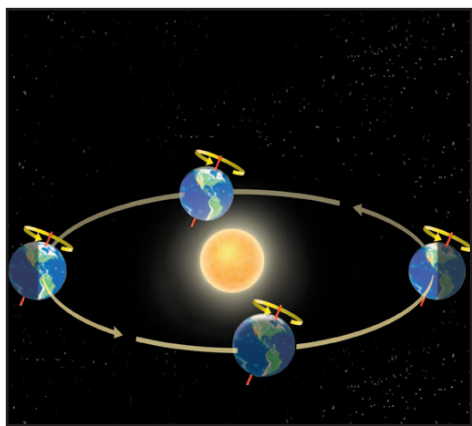
Complete these **detail** statements.

- 2. Our _____ includes nine planets.
- 3. There are _____ inner planets.
- 4. There are _____ outer planets.

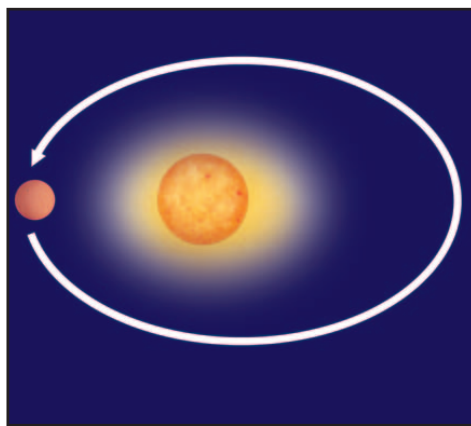
VOCABULARY

- orbit
- elliptical
- inertia
- gravity

What Holds the Moon and Planets in Place?



The Earth's **orbit** is around the sun.



The orbit of Mars is **elliptical**, or oval-shaped.



Inertia keeps a ball at rest or moving.



Gravity helps keep roller coaster cars on the track.



READING FOCUS SKILL

CAUSE AND EFFECT

A **cause** is something that makes another thing happen. An **effect** is the thing that happens.

Look for the **cause** of a planet staying a certain distance from the sun.

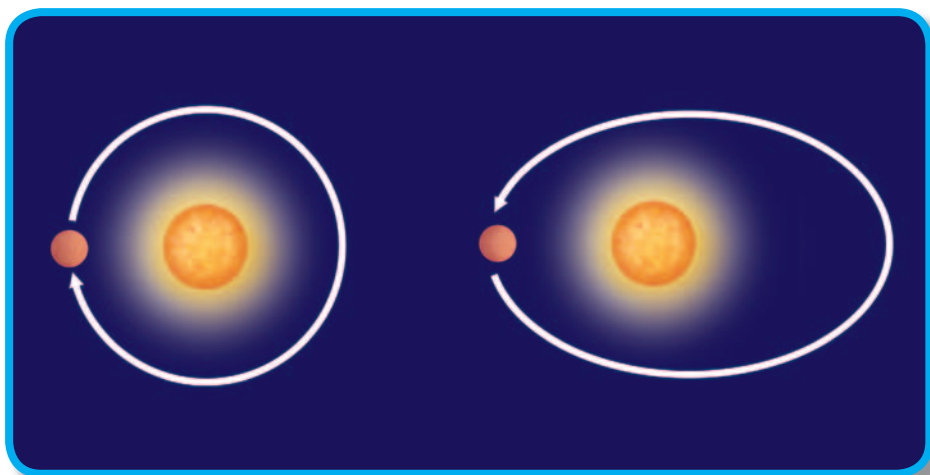


The Path of a Planet Around the Sun

An **orbit** is the path that a body follows as it revolves around another body. The sun is at the center of the solar system. Planets move in **elliptical** orbits around the sun. An elliptical orbit is shaped like a flattened circle. Because the orbits are not circular, each planet is closer to the sun at certain times.



What is the effect of an orbit's shape on the planet's distance from the sun?



▲ Planets travel around the sun in elliptical orbits.

What Holds the Moon and Planets in Orbit?

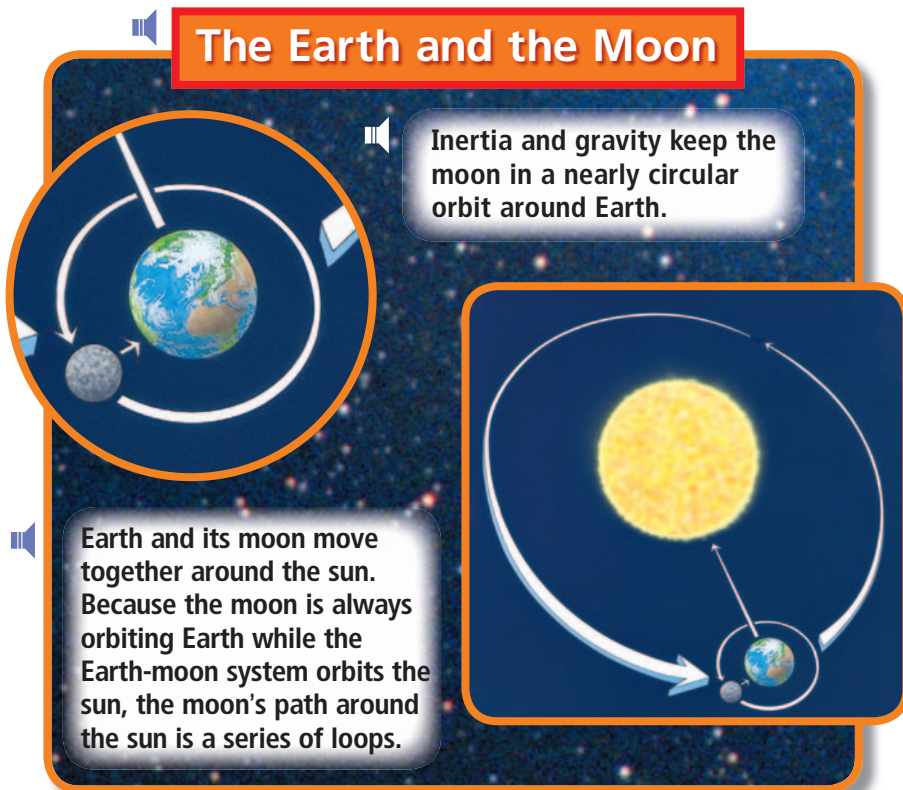
What keeps the planets moving in their orbits?

Inertia keeps an object moving in a straight line at a steady speed. The object will keep going unless pushed or pulled by some force.

Gravity is the force that pulls objects toward Earth. If there were no gravity, Earth would travel forever, in a straight line through space. Gravity causes a pull between the mass of a planet and the mass of the sun.

Gravitational force plus inertia produces a planet's orbit. The sun's constant pull changes a planet's direction. It causes the paths of planets and the moon to be curved.

 **What causes planets to stay in their orbits?**



Phases of the Moon

The way the moon looks from Earth changes every day. Half of the moon is always lit by the sun. How much you see depends on the moon's phase. A moon *phase* is the shape the moon seems to have as it orbits Earth.

 When Earth is between the moon and the sun, you see a full moon. When the moon is between Earth and the sun, you can't see the moon. This is the new moon. Starting with the new moon, you see more and more of the moon each day until you see the full moon.

  **What causes the moon to appear bright?**

 What are the phases of the moon?

 waning gibbous

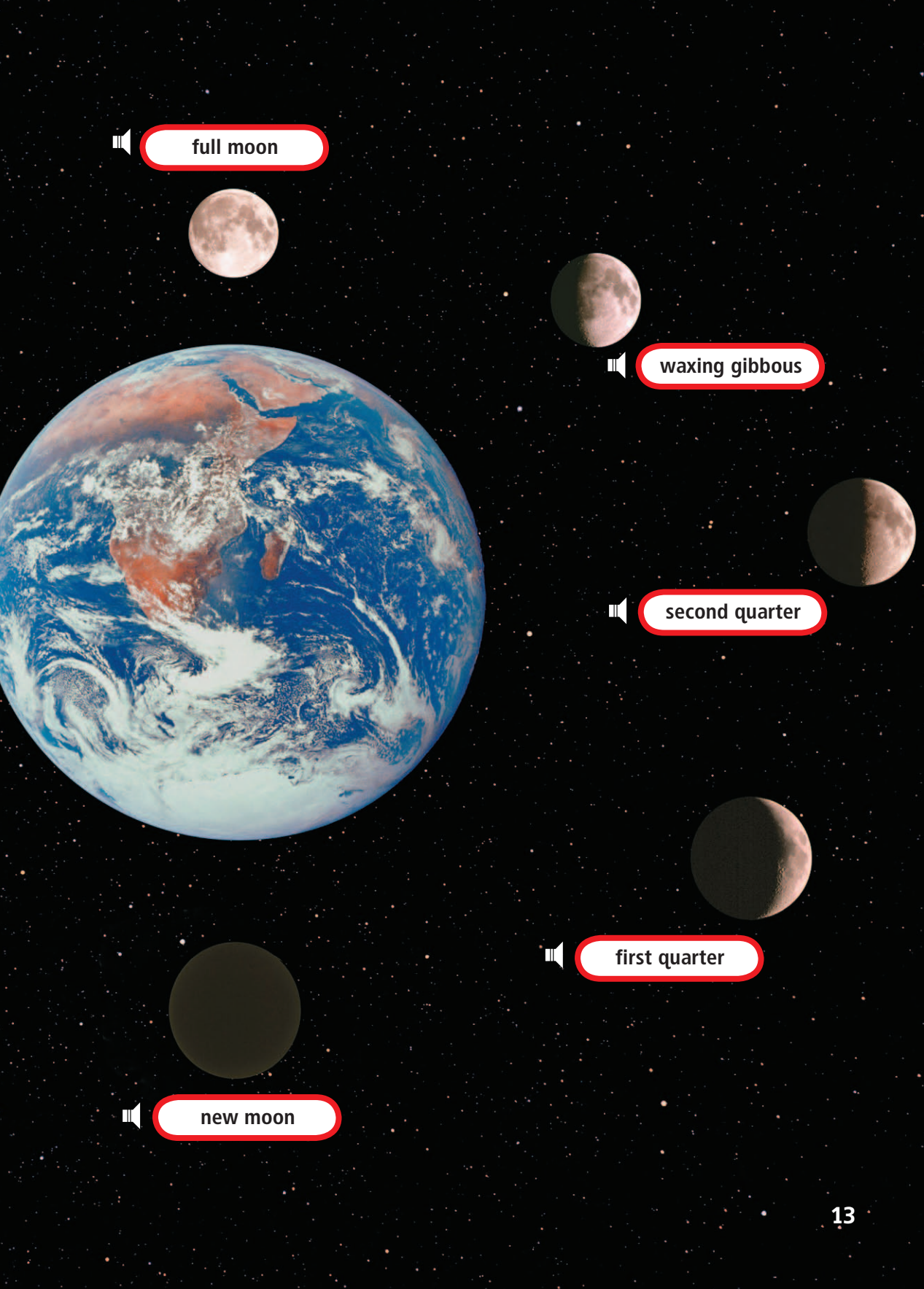


 third quarter



 waning crescent





full moon



waxing gibbous



second quarter

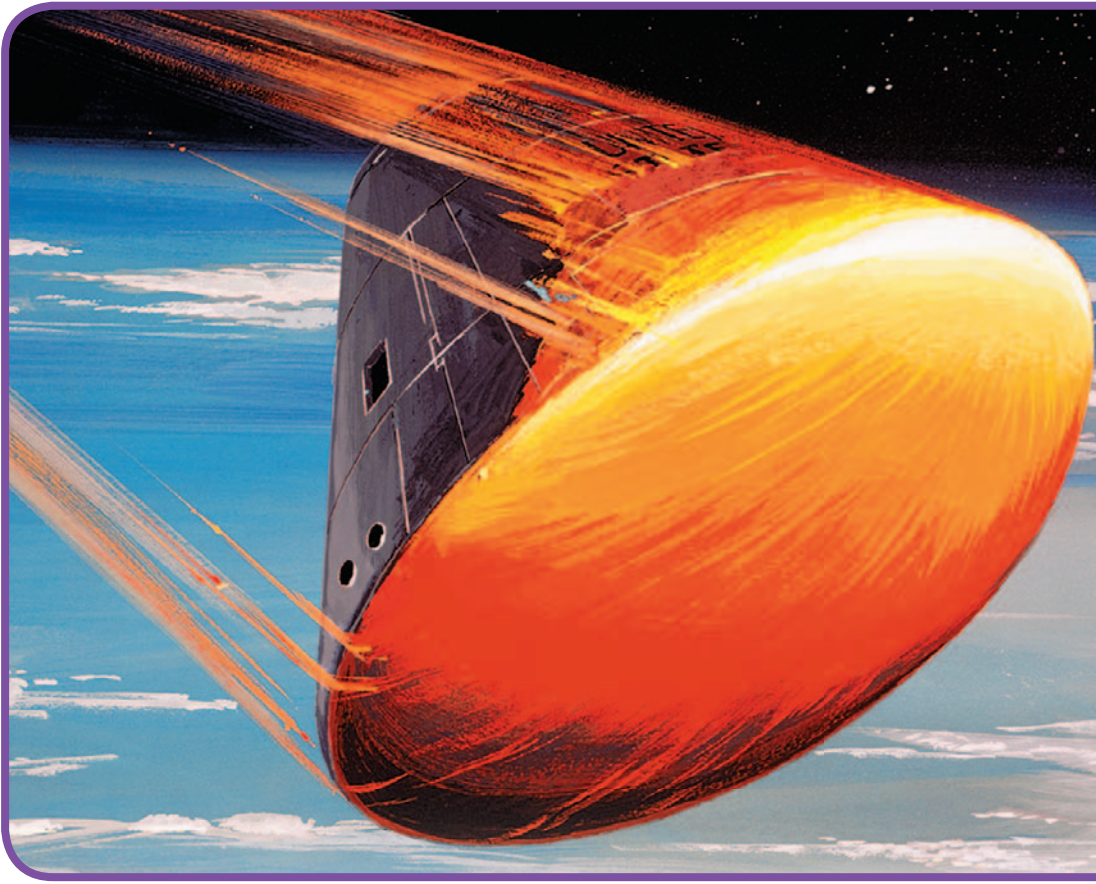


first quarter



new moon



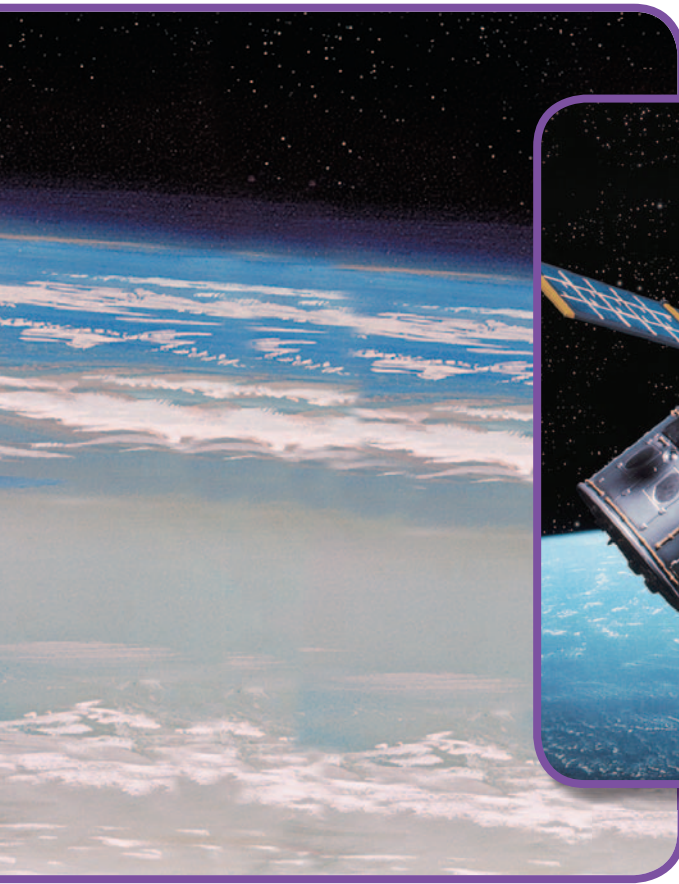


Gravity in Space

Astronauts in the space shuttle orbit close to Earth. The shuttle is so close that gravity is almost as strong there as it is on Earth. Astronauts appear to be weightless because inertia and gravity are balanced.

 The shuttle engines are off but the shuttle moves forward. That is inertia. Earth's gravity pulls on the shuttle as it moves forward. The astronauts inside are really free-falling as the shuttle moves forward.

  **What causes astronauts to appear weightless in space?**



Review



Complete these **cause and effect** statements.

1. The _____ of a planet is due to gravitational attraction between the sun and the planet.
2. _____ and _____ cause planets to stay in their orbits.
3. The moon appears bright because of the _____ .

GLOSSARY

-  **asteroid** [AS•ter•oyd] A piece of rock and metal that orbits the sun.
-  **comet** [KAHM•it] A ball of ice, rock, and frozen gases that orbits the sun.
-  **elliptical** [ee•LIP•tih•kuhl] Oval-shaped.
-  **gravity** [GRAV•uh•tee] The attraction that pulls objects toward Earth.
-  **inertia** [in•ER•shuh] The property of matter that keeps an object at rest or moving in a straight line.
-  **orbit** [OR•bit] The path that one body takes in space as it revolves around another body.
-  **planet** [PLAN•it] A body that revolves around a star.
-  **satellite** [SAT•uh•lyt] A body in space that orbits a larger body.
-  **solar system** [SOH•ler sis•tuhm] A star and all the planets and other objects that revolve around it .

Think About the Reading

-  **1.** What can you do to help you remember what you have learned in this chapter?
-  **2.** What questions do you have after reading this book? How can you find the answers to your questions?

Hands-On Activity

Use clay to model two or more planets.

-  **1.** Label the planets.
-  **2.** Label the planets as inner or outer planets.

School-Home Connection

Explain to a family member what you have read about the solar system. Ask the family member to name the planets in our solar system.