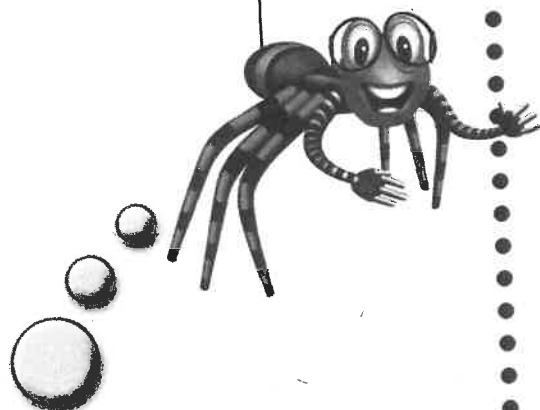


## LESSON 1

# Solar System

► Play Video: Introduction



**What  
makes up the  
solar system?**

## New Vocabulary

**gravity** the force of attraction between any two objects because of their mass

**moon** a natural object that orbits a planet

**orbit** the path an object follows as it revolves

**planet** a large round, or nearly round, body that revolves around the sun and has cleared a path within its own orbit

**solar system** includes the sun and all of the objects that orbit the sun

**star** a hot sphere of gases that gives off energy

## Soon You'll Know

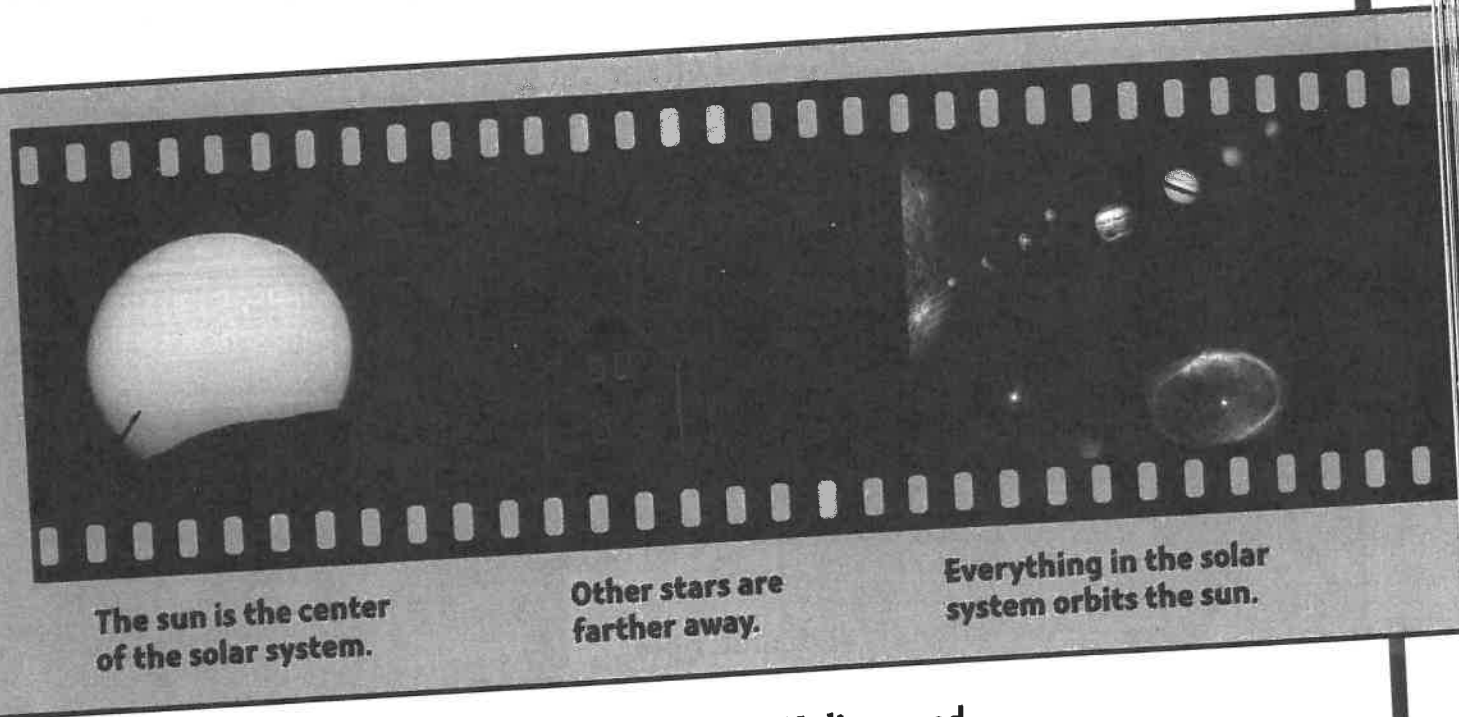
### Main Ideas

1. Why the sun is important to the solar system
2. How the planets move in the solar system
3. What objects besides the planets move in the solar system

## Play Video A: The Sun

**member** In the video you learned about the sun. It's initially the star of our solar system!

**Think about it** There's a reason it's called the **solar system**! Solar means "sun," and the sun is the center of the whole system. In fact, we define the solar system as the sun and everything that travels around it. What is the sun? Simply put, it's a **star**. Most of the lights in the night sky are also stars. They look smaller than the sun because they are very far away.



A star is a hot sphere of gases that gives off energy. Helium and hydrogen make up most of the gases in the sun. But it's the hydrogen combining with other gases in a process called fusion that produces such enormous energy. Of course, that energy is really important to us because the heat and light from the sun support life on planet Earth.

## Now You Know

### Main Idea 1: The Sun

The sun is the center of the solar system and provides heat and light.

## ► Play Video B: The Planets

**Remember** In the video you learned about planets. It's nice to know your neighbors!

**Think about it** The largest objects that **orbit**, or revolve around, the sun are the **planets**. Each planet has its own path around the sun and is held in that path by the force of **gravity**. The planets are much closer to Earth than the stars are. In fact, you can sometimes see a planet shining in the night sky. But like the moon, planets don't produce light, so the light you see is sunlight being reflected off the planet. The planets closest to the sun—Mercury, Venus, Earth, and Mars—are called the inner planets. They all have solid, rocky surfaces like Earth.

### Gas Giants

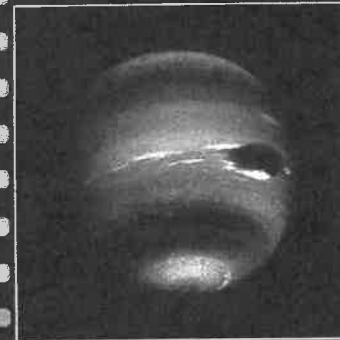
The planets farthest from the sun don't have solid surfaces but are giant spheres of gas. Jupiter, Saturn, Uranus, and Neptune are called the outer planets, or Jovian planets. These planets are sometimes referred to as gas giants.

### Dwarf Planets

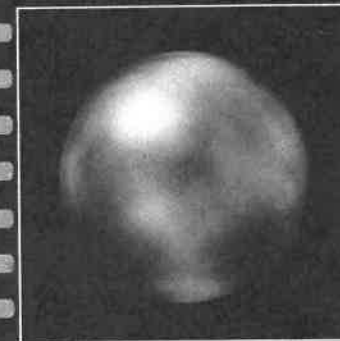
Pluto, which used to be the ninth planet, now belongs to a third category, the **dwarf planets**. Because Pluto is not very large and shares its orbit with other objects, astronomers decided that Pluto belonged in this third group. The large asteroid Ceres and a newly discovered object named Eris are also called dwarf planets.



The terrestrial planets have solid surfaces.



The Jovian planets are giant spheres of gas.



Pluto is now a dwarf planet.

## Now You Know

### Main Idea 2: The Planets

Earth and the other planets orbit the sun.

## ► Play Video C: Asteroids, Comets, and Meteoroids

**Remember** In the video you learned about asteroids, comets, and meteoroids. These are the other objects in our solar system that orbit the sun.

**Think about it** Most of the solar system is empty. But there are some interesting objects out there besides the sun and the big planets. You may be familiar with Earth's **moon**. It's hard to miss. But did you know that there are more than 150 known moons in orbit around the 8 planets? Jupiter has 63 moons in orbit around it. Saturn has 47.

### Other Objects

Asteroids are rocky objects that range greatly in size. Most are small, but some of them are quite large and even have their own moons orbiting around them!

A comet is a ball of ice, gas, and dust. As a comet nears the sun, it begins to produce a trail of gas and dust behind it. This tail can be millions of kilometers long!

A meteoroid is a small piece of debris, such as iron or rock, that orbits the sun. If a meteoroid actually enters Earth's atmosphere, it's called a meteor. You may have heard people call these meteors shooting stars. Sometimes meteors even hit Earth's surface. When they do, they are called meteorites.



Our moon orbits Earth.



Halley's comet can sometimes be seen from Earth.



Meteoroids are sometimes called shooting stars.

## Now You Know

### Main Idea 3: Asteroids, Comets, Meteoroids

Asteroids, comets, and meteoroids also move in the solar system.

# Build Your Vocabulary

## Vocabulary Review

Use the word bank to complete each statement.

1. A natural object that orbits a planet is its \_\_\_\_\_.
2. An \_\_\_\_\_ is the path an object follows as it revolves.
3. The force of attraction between any two objects because of their mass is called \_\_\_\_\_.
4. A large round, or nearly round, body that revolves around the sun in its own orbit is a \_\_\_\_\_.
5. The \_\_\_\_\_ includes the sun and all the objects that are traveling around it.
6. A \_\_\_\_\_ is a hot sphere of gases that gives off energy.

gravity  
moon  
orbit  
planet  
solar system  
star



## Word Play: Rhyming

Poems and songs often use words that rhyme, or have the same sounds at the end. For example:

Earth revolves around the sun.

One time around and a year is done!

Now you do it. Write your own poem using one or more of the new vocabulary words. Make sure you include words that rhyme.

# Check Your Understanding

## Show What You Know

**Main Ideas:** Write the answer to each question.

1. How is our solar system defined?
2. What planets revolve around the sun?
3. What other objects besides planets are in our solar system?

## Critical Thinking

1. **Synthesize** Mercury takes only 88 days to revolve around the sun. Does this mean its orbit around the sun is longer or shorter than Earth's? Explain your answer.
2. **Analyze** Explain why some people call Earth "the blue planet."



Math

in Science

### Writing numbers in word form

Write each of these numbers in word form.

- ◆ The average distance of Earth from the sun is about 150,000,000 km.
- ◆ The average distance of Neptune from the sun is 4,497,000,000 km.
- ◆ The average distance of Eris from the sun is 10,150,000,000 km.

Process Skill

Quick Activity

**Classify** Imagine you discovered an object orbiting the sun very far from Earth. What information would you need to classify it as each of the following:

- |          |                |
|----------|----------------|
| • planet | • dwarf planet |
| • moon   | • asteroid     |
| • comet  | • meteor       |