

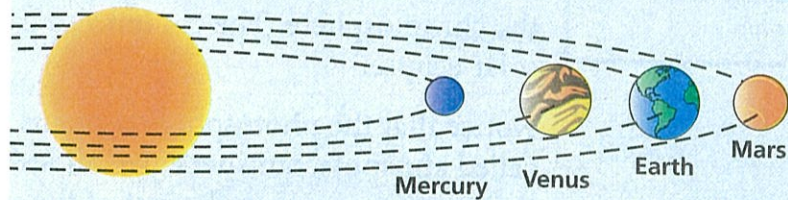
**Objectives**

*After reading this lesson, you should be able to*

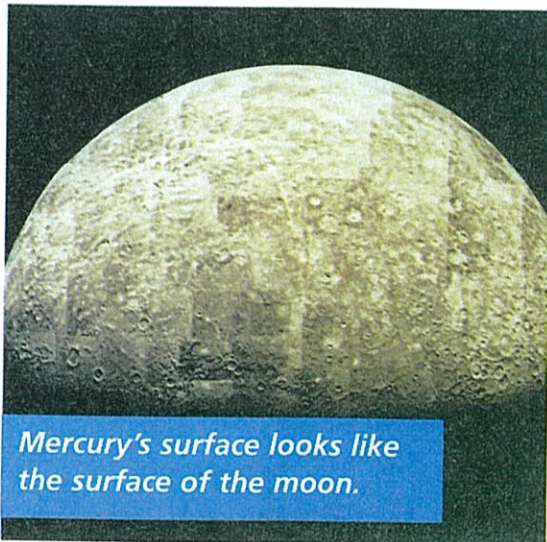
- ▶ identify the four inner planets.
- ▶ describe the four inner planets.
- ▶ explain what the greenhouse effect is and how it affects Venus.

**The Inner Planets**

The planets of the solar system are divided into two groups, the inner planets and the outer planets. The inner planets are the ones that are closest to the sun: Mercury, Venus, Earth, and Mars. All of the inner planets are solid and similar in size. But these rocky worlds are also very different from one another.

**What are the four inner planets?****Mercury**

The planet closest to the sun is Mercury. Named after the Roman god of speed, Mercury is the fastest-moving planet. Its average speed as it orbits the sun is about 50 kilometers per second. Mercury completes an entire revolution of the sun in 88 Earth days, but it rotates slowly. One day on Mercury lasts about 59 Earth days.



*Mercury's surface looks like the surface of the moon.*

Several spacecraft have taken pictures of Mercury's surface. The pictures show that the surface is like that of Earth's moon. It is covered with craters and flat areas. Mercury has almost no atmosphere.

Several spacecraft have taken pictures of Mercury's surface. The pictures show that the surface is like that of Earth's moon. It is covered with craters and flat areas. Mercury has almost no atmosphere.

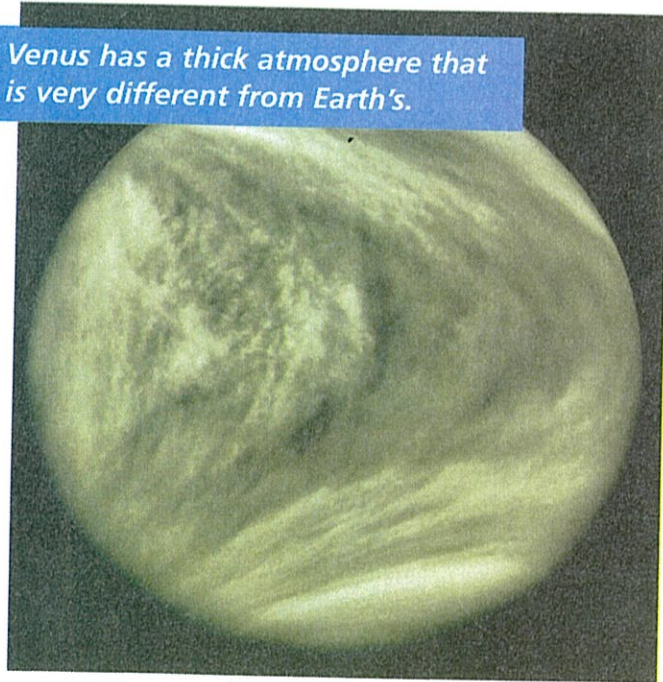
Mercury is not easy to see in the sky because it is so close to the sun. When the sun is above the horizon, all the stars and planets seem to fade away. On some nights you can see Mercury in the western sky just after sunset. Mercury also appears in the east sometimes just before sunrise.

## Venus

The planet that is next closest to the sun is Venus. It was named after the Roman goddess of love and beauty. Venus is one of the brightest objects in the sky. Like the moon, you can sometimes see Venus during the day. Depending on the time of the year, Venus is known as the “morning star” or the “evening star.”

Venus is different from most of the other planets because it rotates in the opposite direction. Earth and the other inner planets rotate from west to east. Venus rotates from east to west. That means the sun rises in the west on Venus. Also, it takes a long time for Venus to rotate. A day on Venus is 243 Earth days.

*Venus has a thick atmosphere that is very different from Earth's.*



### **Greenhouse effect**

*The warming of the atmosphere because of trapped heat energy from the sun.*

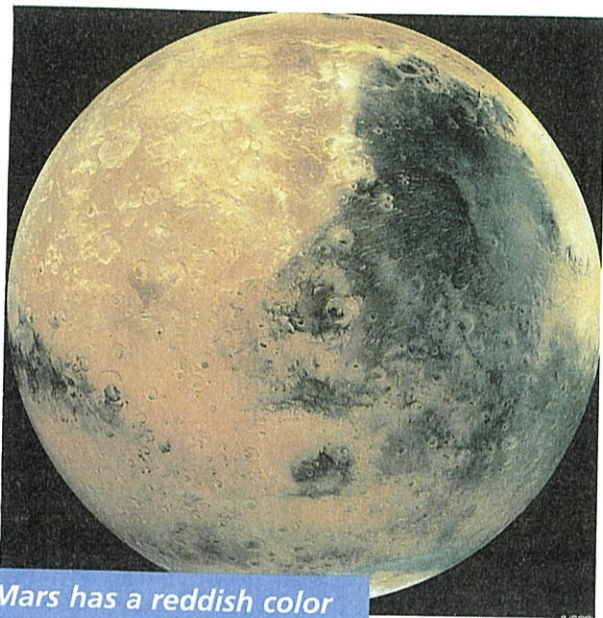
The atmosphere of Venus contains great amounts of the gas carbon dioxide. Carbon dioxide in the atmosphere traps heat energy from the sun. As a result, the atmosphere heats up. This warming is called the **greenhouse effect**. The greenhouse effect occurs on Earth, too. The clouds of Venus's atmosphere are made of tiny drops of sulfuric acid. These clouds trap heat and add to the greenhouse effect. Because of the greenhouse effect, the surface temperature of Venus is very high—about 500°C. The surface of the planet would be much cooler without the greenhouse effect.

### **Earth**

Our own planet, Earth, is the third planet from the sun. Earth has several differences from the other inner planets. For one thing, it is the largest. Earth also has a mild surface temperature, a dense atmosphere, and a great deal of water. Because of these features, Earth can support life. There is no evidence of life on the other planets, although some form of life may have existed on Mars billions of years ago. Earth is also the closest planet to the sun that has a moon.

*Earth's land areas and oceans are visible from space.*





Mars has a reddish color in the night sky.

## Mars

Mars, the fourth planet from the sun, is named for the Roman god of war. Mars has two small moons. Mars rotates once every 24 hours and 38 minutes. It takes Mars 687 Earth days to complete one revolution around the sun.

The atmosphere on Mars is much less dense than Earth's. The atmosphere is mostly carbon dioxide. Mars is colder than Earth because it is farther from the sun and has a thinner atmosphere that does not trap heat.

### Facts About the Inner Planets

	Mercury	Venus	Earth	Mars
Distance from the sun (millions of kilometers)	58	107	149	227
Diameter (kilometers)	4,800	12,000	12,640	6,720
Number of satellites (moons)	0	0	1	2
Length of day (Earth days)	59	243	1	1
Length of year (Earth days)	88	225	365	687

### Self-Check

1. What are the names of the inner planets?
2. How would you describe Mercury?
3. What is the greenhouse effect?
4. What features enable Earth to support life?
5. What is the atmosphere of Mars mostly made of?