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## Asteroids

- About 6,000 asteroids have been discovered; several hundred more are found each year. There are likely hundreds of thousands more that are too small to be seen from Earth.

- Asteroids are bodies of rock covered with craters. One of the largest is called Vesta. Vesta is different from most asteroids. Data collected by the Hubble Space Telescope have shown that Vesta has spots and patches on its surface.

- Most asteroids orbit the sun in the area between Mars and Jupiter called the asteroid belt.

- Though they are not visible with the naked eye, many asteroids can be seen with small telescopes. In a very dark sky they would appear as small points of light.

**Game Question:**  
Which planet has the Great Red Spot?

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Image taken by NASA

## Earth

*Distance from sun: 149,600,000 kilometers  
(92,960,000 miles)  
Diameter: 12,756 kilometers (7,926 miles)*

- Earth is the fifth largest planet and the third from the sun.
- Earth's atmosphere is made of 77 percent nitrogen and 21 percent oxygen, with traces of argon, carbon dioxide, and water.
- Liquid water covers 71 percent of the Earth's surface. The other 29 percent is made of rock and soil. Earth is the only planet that has liquid water on its surface.
- White clouds of water vapor hide much of the Earth's surface.
- Earth has one moon.

**Game Question:**  
Which planet is the only one that spins on its side?

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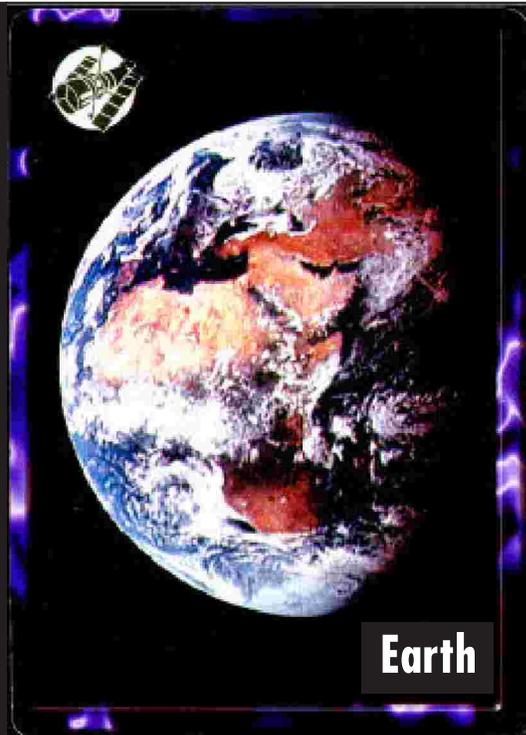


Image taken by Apollo 10

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Image taken by the Hubble Space Telescope

## Mars

*Distance from sun: 227,940,000 kilometers (141,600,000 miles) ; Diameter: 6,794 kilometers (4,222 miles)*

- Mars' surface has craters, valleys, ridges, hills, and plateaus.
- A long time ago, Mars' surface had liquid water, too. The planet has clear evidence of erosion in many places. Now, all the water left on Mars is frozen in the polar ice caps.
- Mars has a very thin atmosphere that contains mostly carbon dioxide.
- Mars' surface is red; its clouds and haze are blue. Mars is the seventh largest planet and the fourth from the sun. The planet is about 1 1/2 times as far from the sun as the Earth. Its diameter is about one-half of the Earth's diameter.
- Mars has two known moons.

**Game Question:**  
Which planet is sometimes farther from the sun than Pluto?

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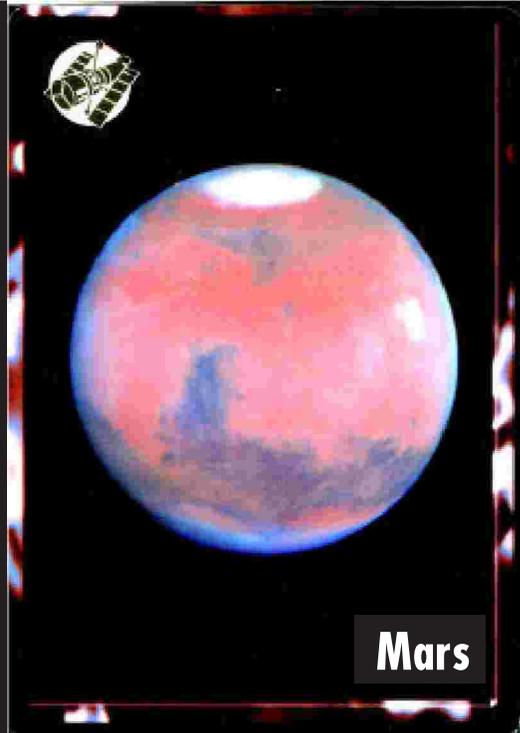


Image taken by the Hubble Space Telescope

## Comets

- Comets are a mixture of ice and dust that failed to come together to form a planet. They are sometimes called "dirty snowballs" or "icy mudballs."
- Comets are almost invisible, except when they are near the sun's heat.
- Comets become visible when ice is changed into gas by the sun's heat. The gas carries dust. This dust and gas form the comet's head and tail.
- Some famous comets are Halley, Hyakutake, and Shoemaker-Levy 9.
- Meteor showers sometimes occur when the Earth passes through a comet's orbit.

**Game Question:**  
Which planet is sometimes called Earth's sister planet?

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## Mercury

*Distance from sun: 58,344,000 kilometers  
(36,250,000 miles)*

*Diameter: 4,880 kilometers (3,032 miles)*

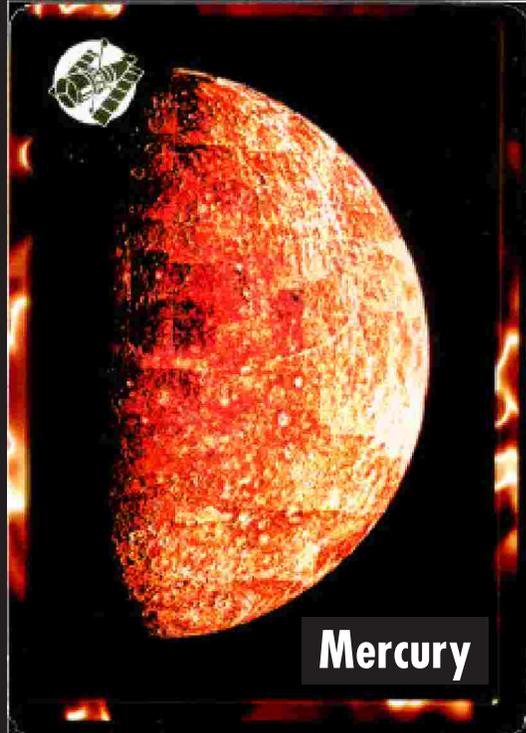
- Mercury is, in many ways, similar to the Earth's moon because its solid surface is covered with craters.
- There is evidence of ice in the protected shadows of craters near the north pole.
- Mercury has almost no atmosphere.
- Mercury is the eighth largest planet and the closest to the sun. Mercury is about one-third of the Earth's distance from the sun. Mercury's diameter is about one-third of the Earth's diameter.
- Mercury has phases, like the moon. Mercury looks like a crescent moon when it passes between Earth and the sun. Mercury has no moons.

### Game Question:

Which is the only planet that has liquid water on its surface?

Image taken by Mariner 10

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## Jupiter

*Distance from sun: 778,330,000 kilometers (483,600,000 miles) ; Diameter: 142,984 kilometers (88,850 miles)*

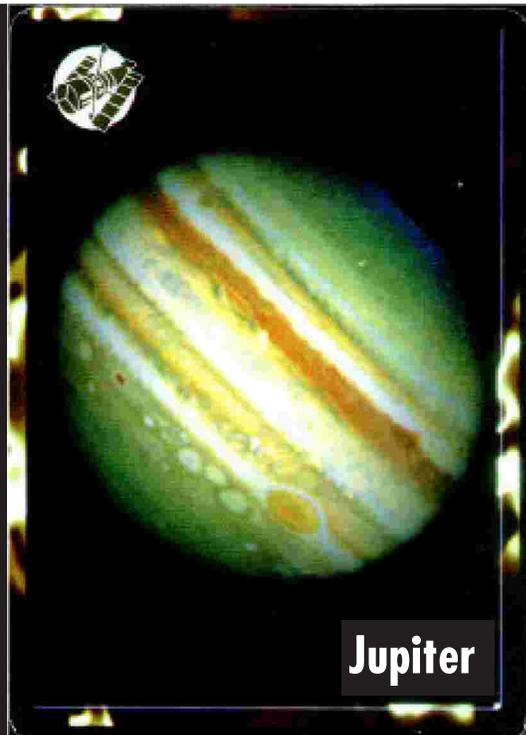
- Jupiter is the fifth planet from the sun and about five times as far from the sun as the Earth. Its diameter is about 11 times greater than the Earth's diameter.
- More than 1,000 Earths could fit inside Jupiter.
- Jupiter does not have a solid surface. The planet is a ball of liquid surrounded by gas.
- By mass, Jupiter is made of 75 percent hydrogen and 23 percent helium, with traces of methane, water, ammonia, and rock.
- Jupiter has an interesting feature called the Great Red Spot, a huge storm of swirling gas that has lasted for hundreds and hundreds of years. But the Great Red Spot may not appear bright red.
- Jupiter has 16 known moons, four large and 12 small.

### Game Question:

Which object is the largest in the solar system?

Image taken by the Hubble Space Telescope

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Image taken by the Hubble Space Telescope

## Pluto

*Distance from sun: 5,913,520,000 kilometers  
(3,674,000,000 miles)  
Diameter: 2,340 kilometers (1,454 miles)*

- Pluto is the smallest planet and usually the farthest from the sun. Pluto is about 40 times as far from the sun as the Earth. Its diameter is about one-fifth of the Earth's diameter.
- Pluto is the only planet that has not been visited by a spacecraft. Only recently has the Hubble Space Telescope seen features on Pluto's surface. The images of Pluto are not clear because the planet is so far away.
- Pluto's composition is unknown, but it is probably mostly rock, ice, and frozen gases.
- Pluto's atmosphere is also unknown, but it most likely contains mainly nitrogen, with a little carbon monoxide and traces of methane.
- Pluto has one known moon, Charon.

**Game Question:**  
Which group of space objects is made of chunks of rock?

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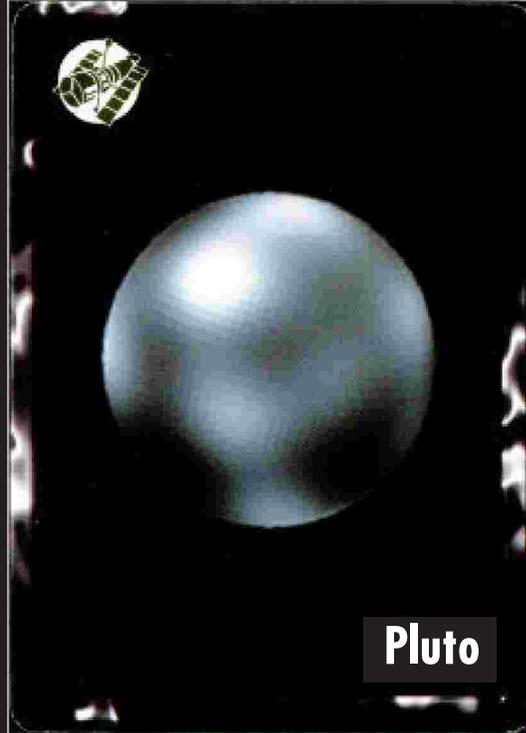


Image taken by the Hubble Space Telescope

## Neptune

*Distance from sun: 4,504,000,000 kilometers  
(2,798,655,850 miles)  
Diameter: 49,528 kilometers (30,775 miles)*

- Neptune is the fourth largest planet and the eighth from the sun. Neptune is about 30 times farther than the Earth is from the sun. Its diameter is about four times larger than Earth's diameter.
- Neptune's orbit is sometimes crossed by Pluto's irregular orbit. Since 1979 Neptune has been the most distant planet from the sun; Pluto again will be the most distant in 1999. Neptune's atmosphere contains mostly hydrogen and helium with a small amount of methane.
- The small amount of methane gives Neptune its blue-green color. Neptune has eight known moons, the largest, Triton, is almost as big as Earth's moon.

**Game Question:**  
Which celestial objects are called "dirty snowballs"?

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## Saturn

*Distance from sun: 1,429,400,000 kilometers  
(888,200,000 miles)*

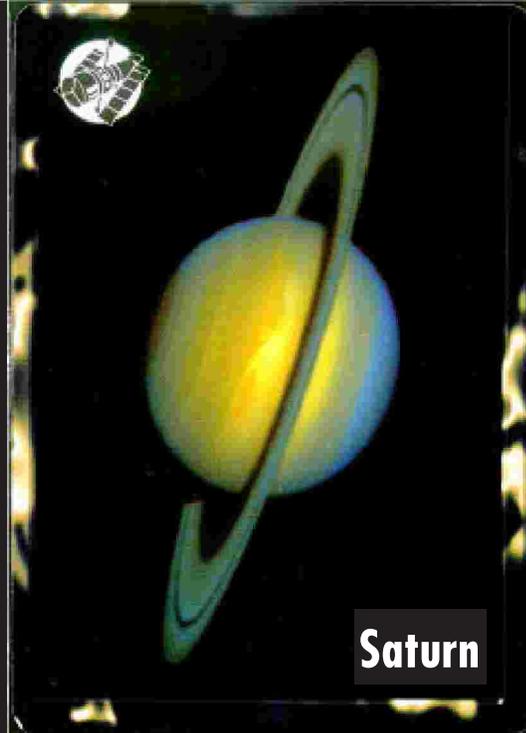
*Diameter: 120,536 kilometers (74,900 miles)*

- Saturn is the second largest planet and the sixth from the sun. Saturn is about 10 times as far from the sun as the Earth. Its diameter is about nine times larger than the Earth's diameter.
- Saturn is made of materials that are lighter than water. If you could fit Saturn in a bathtub, it would float!
- By mass, Saturn contains about 92 percent hydrogen and 6 percent helium, with traces of methane, ammonia, water, and rock.
- Saturn has thousands of rings. Saturn's rings are made of rocks, dust, and water ice, all of which are orbiting the planet.
- Saturn has 18 named moons, the most of any planet.

**Game Question:**  
Which planet is closest to the sun?

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Image taken by the Hubble Space Telescope



## Sun

*Diameter: 1,390,000 kilometers (863,710 miles)*

- The sun is the biggest, brightest, and hottest object in the solar system.
- The sun is an ordinary star, one of 100 billion or more stars in our galaxy.
- More than 1 million Earths could fit inside the sun. It is, by far, the largest object in the solar system.
- By mass, the sun is made of about 70 percent hydrogen and 28 percent helium.
- The sun is about 4.5 billion years old. It will continue to put out heat and light for about 5 billion more years.
- Sunspots are cooler regions on the sun's surface. X-ray images of the sun, such as the one on the front of this card, show jets of fire on its surface. These fireballs are giant storms — called solar flares — on the sun's surface.

**Game Question:**  
Which planet, other than Earth, shows evidence of once having liquid water on its surface?

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Image taken by Yohkoh Satellite



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Image taken by the Hubble Space Telescope

## Uranus

*Distance from sun: 2,870,990,000 kilometers  
(1,784,000,000 miles)*

*Diameter: 51,118 kilometers (31,760 miles)*

- Uranus is the third largest planet and the seventh from the sun. Uranus is about 19 times as far from the sun as the Earth. Its diameter is about four times larger than the Earth's diameter.
- Uranus is one of the four giant gas planets. Like other giant gas planets, Uranus' core was made from rock pieces and frozen gas.
- The atmosphere on Uranus contains, by mass, about 72 percent hydrogen, 26 percent helium, and some methane.
- The methane is what makes the planet appear blue-green.
- Uranus spins on an axis that is tilted more than any other planet. The planet looks like a top spinning on its side.
- Uranus has 15 known moons.

### Game Question:

Which planet is, by far, the smallest?

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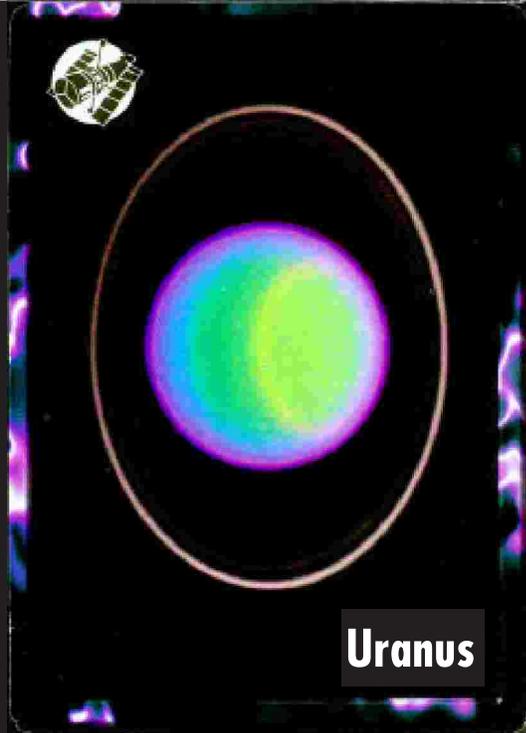


Image taken by the Hubble Space Telescope

## Venus

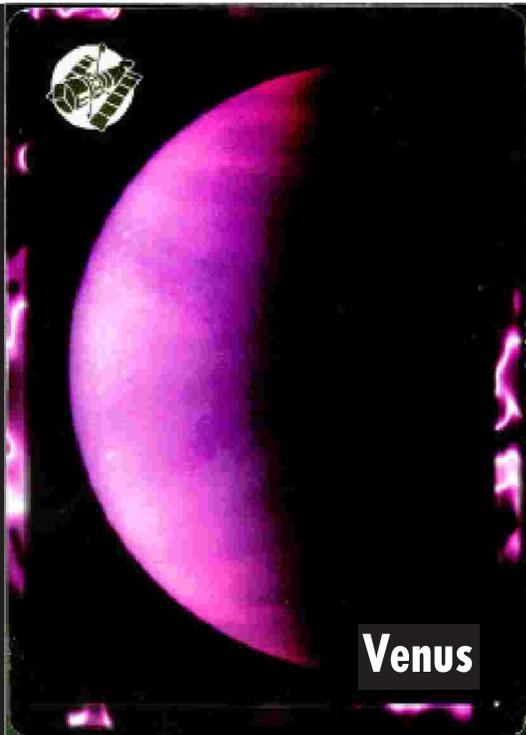
*Distance from sun: 108,200,000 kilometers (67,230,000 miles); Diameter: 12,103 kilometers (7,521 miles)*

- Venus is the sixth largest planet and the second from the sun. Venus is about three-fourths of the Earth's distance from the sun.
- The surface is rocky and very hot. The atmosphere completely hides the surface and traps the heat. The temperature is around 400 degrees Celsius (780 degrees Fahrenheit).
- The atmosphere contains mostly carbon dioxide. The layers of clouds surrounding Venus contain sulfuric acid.
- The image on the front of this card makes Venus look purple. But the planet is really white and featureless.
- Venus is sometimes regarded as Earth's sister planet. The two objects are very similar in many ways. Venus is only slightly smaller than Earth. The two planets also are made from similar kinds of material, such as rock. Venus has no moons.

### Game Question:

Which planet is famous for its rings?

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Cover: Hubble Space Telescope during First Servicing Mission / NASA Image

## How to Play

1. The teacher distributes one card to each of 12 students.
2. The students silently read the information on the back of their cards.
3. The game begins when one student reads aloud the information and the question on the back of his or her card.
4. The student holding the card with the answer to the question stands and reads the information on his or her card.
5. The game continues until all the cards have been read.

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