

Mercury

- 1. HOW LONG IS A MERCURY YEAR?(HOW LONG DOES IT TAKE MERCURY TO ORBIT THE SUN)**
- 2. HOW DO THE SURFACE TEMPERATURES OF MERCURY CHANGE WITH DAY AND NIGHT? WHY?**
- 3. HOW ARE MERCURY AND THE MOON SIMILAR?**
- 4. WHAT SUPPORTS THE FACT THAT MERCURY HAS NO ATMOSPHERE?**
- 5. WHERE IS MERCURY LOCATED IN OUR SOLAR SYSTEM?**
- 6. WHAT IS THE SURFACE OF MERCURY COVERED BY?**
- 7. HOW LONG IS MERCURY DAY?**

Mercury

- Mercury is the eighth largest planet (or second smallest) in the Solar



Location:	Closest to Sun
Distance from Sun:	57,910,000 km
Mercury Day:	58.65 Earth Days
Mercury Year:	87.97 Earth Days
Orbital Speed:	47.8 km/sec
Eccentricity of Orbit:	0.206
Satellites:	None
Diameter:	4,878 km
Mass:	3.30×10^{23} kg

- System.
- The only spacecraft to visit to Mercury was made by the Mariner 10 spacecraft in 1974.
 - Because Mercury has *no atmosphere*, its surface is covered with craters.
 - The surface of Mercury closely resembles the Earth's Moon. Both the Moon and Mercury have *no atmosphere*, and is therefore covered with craters. Mercury has few non-cratered areas on the surface, with the exception of the large flat area known as the Caloris Basin, and a few other small areas. The Caloris Basin, the result of an asteroid impact, is 1300 km in diameter.
 - The surface temperatures of Mercury can change dramatically during the day and night. The daytime side of the planet can get very **hot** (400 degree C). On the night side, Mercury can get very **cold** (-170 degrees C). These temperature fluctuations are the result of mercury having *no atmosphere*
 - Mercury was believed by the Greeks to be two different stars. Mercury's appearance in the morning was called Apollo, and its evening appearance was referred to as Hermes.
 - Mercury, often identified with the Greek god, Hermes, is the messenger of the gods in Roman mythology. Mercury is often characterized with winged sandals.
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Venus

- 1. What is the position of Venus? What planets are next to Venus?**
- 2. Compare a Venus year to a Venus day:**
- 3. Why is Venus the hottest planet in the solar system?**
- 4. What gas is responsible for Venus's greenhouse effect?**
- 5. What are the clouds of Venus made of?**
- 6. Compare and contrast Venus and Earth. How are they different; how are they the same?**
- 7. What would the atmospheric pressure of Venus do to us?**

Venus



Location:	Second from Sun
Distance from Sun:	108,200,000 km (.72 AU)
Venus Day:	243 Earth Days
Venus Year:	224.7 Earth Days
Orbital Speed:	35 km/sec
Eccentricity of Orbit:	0.007
Satellites:	None
Diameter:	12,100 km
Mass:	4.869×10^{24} kg
Major Atmospheric Gas:	Carbon Dioxide

- Venus is the sixth largest planet in the Solar System.
- Similar in size, and density, Venus and Earth often referred to as sister planets. However the surface and atmosphere of the two planets are drastically different.
- The atmosphere of Venus is composed of carbon dioxide, while earth's atmosphere is composed of Nitrogen and oxygen
- Carbon dioxide, gives Venus a severe greenhouse effect, making it the hottest in the solar system. In fact the surface temperature of Venus is over 480 degrees C (900 degrees F).
- Venus would have a cold climate if it weren't for the high concentration of carbon dioxide in its atmosphere (96%). The green house effect is the result of an atmosphere rich in Carbon dioxide, a gas known to trap heat in like a blanket
- The clouds in Venus' atmosphere are composed of sulfuric acid, and of course, our clouds here on earth are composed of water.
- The deadly sulfuric acid clouds cause the planet to reflect 65% of the sunlight that reaches it. Thus, Venus the third brightest object in the sky (third only to the Sun and the Moon).
- The atmospheric pressure on the surface of Venus is that 90 times the pressure on Earth and would crush a human.
- The surface of Venus is very dry with flat plains, highland regions, and depressions.

- The interior of Venus is composed of a central iron core and a molten rocky mantle, similar to the composition of Earth.
- As Venus orbits around the sun, it rotates very, very, slow.
- A day on Venus would last (243 Earth days), which is longer than its year (224.7 Earth days). The rotation is also opposite from that of Earth, with the Sun rising in the West.
- Venus has been visited by over 20 spacecrafts. The first visit was made by Mariner 2 in 1962. The Soviet Venera 7, which visited Venus in 1970, was the first spacecraft to land on another planet. A recent visit made by the Magellan, launched in 1989, produced high resolution maps of the surface using radar.
- Venus is named after the Roman goddess of love and beauty



- 1. What are the three layers that make up Earth? What is the core made of?**
- 2. Besides life, what makes the Earth unique?**
- 3. What two main gases make up our atmosphere? (Which one is 78% and which one 21%)**
- 4. How old is Earth? How do we know this?**
- 5. Where does Carbon Dioxide come from? How is it affecting the temperature of Earth?**

6. Where is Earth located in our solar system? Which planets are next to Earth?

7. How fast are we moving around the sun (orbiting)?

Earth



Location:	Third from the Sun
Distance from Sun:	149,600,000 km
Earth Day:	24 hours
Earth Year:	365 Earth Days
Orbital Speed:	29.8 km/sec
Eccentricity of Orbit:	0.017
Satellites:	1
Diameter:	12,756 km
Mass:	5.976×10^{24} kg
Major Atmospheric Gas:	Nitrogen

- Earth is the fifth largest planet in the Solar System.
- The oldest rocks found on Earth tell us that the earth is around 4.6 billion years old.
- Earth is the only presently known planet in the Solar System to support life. The earliest fossil evidence for life dates back 3.5 billion years ago.
- 71% of Earth's surface is covered in water.
- The Earth is the densest planet in the Solar System.
- The Earth travels at an orbital speed of 108,000 km (67,000 miles) an hour.
- The Earth has only one satellite, the Moon. The Moon is the second brightest object in the sky.
- The Earth's atmosphere is composed mainly of nitrogen (78%), oxygen (21%), argon (.93%), and carbon dioxide (0.03%).
- The surface features on Earth are extremely varied with vast oceans, tall mountains, rolling plains, canyons, swamps, and deserts. The tallest mountain on our planet, Mount Everest in the Himalayas, stands at an altitude of 8,872 m (29,108 ft). Located in Africa, the Sahara, the largest desert on Earth, spans over 500,000 sq km (2,123,000 sq miles) of land. The Grand Canyon, a canyon of multi covered rock terraces cut by the Colorado River, stretches over 350 km (217 miles) of land.
- 71% of the Earth's surface is covered in water, which holds vast amounts of ocean life and maintains the temperature of the planet.

- Earth has an average surface temperature of 13 degrees C (55.4 degrees F). The planet would be much colder without greenhouse gasses, such as carbon dioxide and water vapor, which trap heat, making our planet warmer
- The greenhouse effect is increasing global temperatures (making the world hotter) due to an increase in Carbon Dioxide from car exhaust and industry pollution. The increase in global temperatures is called global warming
- Earth is unique not only because it has life, but, because it is active with earthquakes and volcanoes due to plate tectonics
- Earth is composed of three layers: a core, a mantle, and an outer crust. The core is composed of two parts: an inner core of solid iron and nickel (2,600 km in diameter), and an outer core made of liquid iron and nickel (2,250 km thick).

Mars

- 1. What are the names of Mar's two small satellites? (Moons)**
- 2. What is the name of the largest volcano in the solar system?**
- 3. The atmosphere of Mars is composed mostly of what gas?**
- 4. What can be found at the polar regions of Mars? What are they made of?**

5. What evidence does Mars have on its surface that proves it once contained liquid water on it?

Location:	Fourth from Sun
Distance from Sun:	227,940,000 km
Mars Day:	24.6 Earth Hours
Mars Year:	686.98 Earth Days
Orbital Speed:	24.2 km/sec
Eccentricity of Orbit:	0.093
<u>Satellites:</u>	Two
Diameter:	6,794 km
Mass:	6.4219×10^{23} kg
Major Atmospheric Gas:	Carbon Dioxide

6. What gives Mars its red surface?

7. Is Mars a Rocky or Gaseous planet?

Mars



- Mars is the seventh largest planet in the Solar System.
- Mars is known as the Red Planet because its surface is covered with rock made of Iron oxide (rust).
- In observation of Mars seasonal changes and river channels on the surface, many scientists hoped for a possibility of Martian life. They speculated that the composition of Mars' was similar enough to Earth to support life. However, the atmosphere on Mars is very different than Earth's, with only small amounts of life supporting oxygen and water.
- The atmosphere on Mars is very thin, composed mainly of carbon dioxide (95%), nitrogen (2.7%), and argon (1.6%), with traces of oxygen and water.
- Mars has polar ice caps, composed of solid ice and carbon dioxide, that advance and retreat with the changing seasons.
- Temperatures on Mars vary from a maximum of 0 degrees C (32 degrees F) to minimum -100 degrees C (-148 degrees F).

- The terrain on Mars is complex and varied, with deep canyons, mountains, volcanoes, and craters. Olympus Mons, the largest volcano in the Solar System, stands on Mars with an altitude of 24 km (78,000 feet) with a base that is 600 km across. Valles Marineris is a system of canyons that stretch out over the surface of Mars for nearly 2,500 miles (4000 km). The canyons can get up to 200 km wide and 6 km deep in some areas.
 - Erosion and dried up river channels on the surface of Mars revealed that there were once large amounts of water on the planet. There were river systems and possibly lakes and oceans on the planet over 4 billion years ago. This evidence has lead scientists to believe that Mars at one time may have supported life billions of years ago.
 - Mars has two small irregular shaped moons named Phobos and Deimos.
 - Mars is the god of war in Roman mythology.
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Jupiter

1. Is Jupiter a ROCKY or GAS planet?
2. What two main gases make up Jupiter?
(Hint: they both start with an "h")
3. How long is a Jupiter day in earth hours?
Does Jupiter rotate fast or slow on its axis?
4. How long is a Jupiter year?

5. What is the great red Spot on Jupiter? Is it continuous?
6. Where is Jupiter located in our solar system? What planets are next to Jupiter?
7. How big is Jupiter compared to the rest of the planets in our solar system?

Jupiter



Location:	Fifth from the Sun
Distance from Sun:	778 million km
Jupiter Day:	10 hours
Jupiter Year:	12 Earth years

Orbital Speed:	13.1 km/sec
Satellites:	16 (plus rings)
Number of paces from Mars to Jupiter:	95 steps
Mass:	1.90×10^{27} kg
Diameter:	12,756 km
Size Rank:	Largest planet (1)
AU distance form the sun	5.2 AU
Time it takes light from the sun to reach Jupiter:	30 minutes
Classification :	Gassy, Jovian Planet

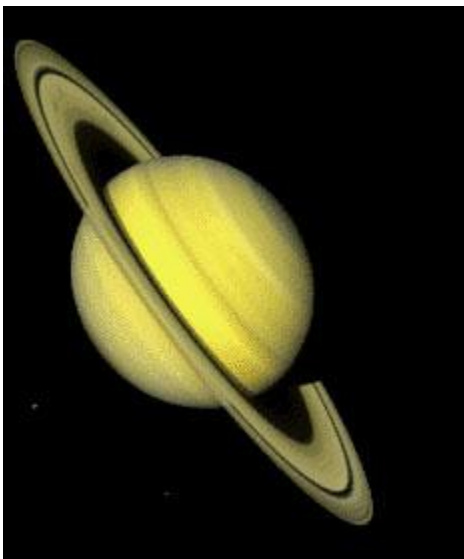
Saturn

- 1. How big is Saturn in relation to the other planets? Which planet is bigger than Saturn?**
- 2. Is Saturn less or more dense than water? Could Saturn float in water?**
- 3. What are Saturn's rings made of?**
- 4. Is Saturn a rocky or gaseous planet?**
- 5. What gases make up Saturn?**

6. Where is Saturn located in our Solar System? Which two planets are next to Saturn?

7. How long is a Saturn day?

Saturn



- Saturn is the sixth planet from the Sun and the second largest.
- Saturn is flattened at the poles, due to a fast rotation on its axis.
- Galileo discovered Saturn in 1610, and was confused by its strange appearance in his telescope.
- Saturn is a gas planet, like Jupiter, and is large enough and far enough away from the Sun to retain its original primitive gases. The atmosphere on Saturn is primarily composed of

- hydrogen, with small amounts of helium and methane.
- Saturn is the only planet in our solar system that is less dense than water.

Location:	Sixth from Sun
Distance from Sun:	1,427 million km
Saturn Day:	10 hours, 14 minutes
Saturn Year:	29.5 Earth Years
Orbital Speed:	9.7 km/sec
Eccentricity of Orbit:	0.056
<u>Satellites</u> :	18 (plus <u>rings</u>)
Equatorial Diameter:	120,536 km
Polar Diameter:	108,728 km

- Saturn is well known for its beautiful ring system, which are composed of millions of particles of dust, ice and snow. The ring system is divided into various parts, including rings and gaps. The bright A and B rings are separated by a large gap called the Cassini Division. Radial "spokes" composed of fine particles, about the size of dust specks, were found in the B-Ring by the Voyager.
- Wind blows at high speeds on Saturn, reaching velocities of 500 meters a second (1,100 miles an hour) at the equator.
- Saturn has 18 known moons.
- Saturn was the god of agriculture in Roman mythology. Saturn is also the father of Jupiter, the king of the Roman gods.

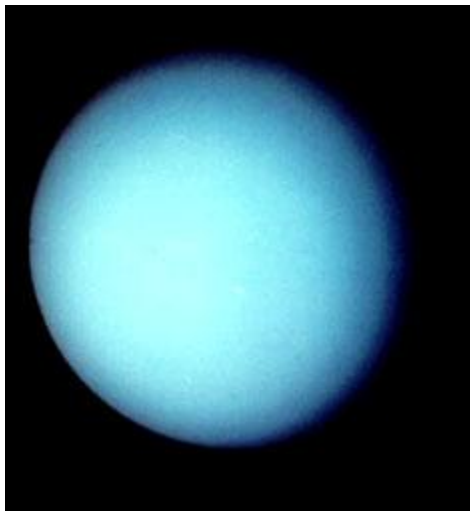
Mass:	5.688e26 kg
Major Atmospheric Gas:	Hydrogen

Uranus

1. How big is Uranus in relation to the other planets? Which planets are bigger than Uranus?
2. What gas gives Uranus its bluish color?
3. How does Uranus rotate on its axis in relation to the other planets?

4. What do Saturn and Uranus have in common? Which one is Bigger? Which one is smaller?
5. What are the rings of Uranus made of?
6. What is the location of Uranus in our solar system? Which planets are next to Uranus?
7. How long is a Uranus year?

Uranus



Location:	Seventh from Sun
Distance from Sun:	2,870,990,000 km
Uranus Day:	0.72 Earth Days
Uranus Year:	84.01 Earth Years
Orbital Speed:	6.6 km/sec
Eccentricity of Orbit:	0.047
Satellites:	15 (plus <u>rings</u>)
Diameter:	51,800 km
Mass:	8.686e25 kg
Major Atmospheric Gas:	Hydrogen

- Uranus is the third largest planet in the Solar System behind Jupiter and Saturn
- The gaseous planet is composed of hydrogen, helium, and methane. The methane in the atmosphere absorbs red light, giving the planet a blue-green color.

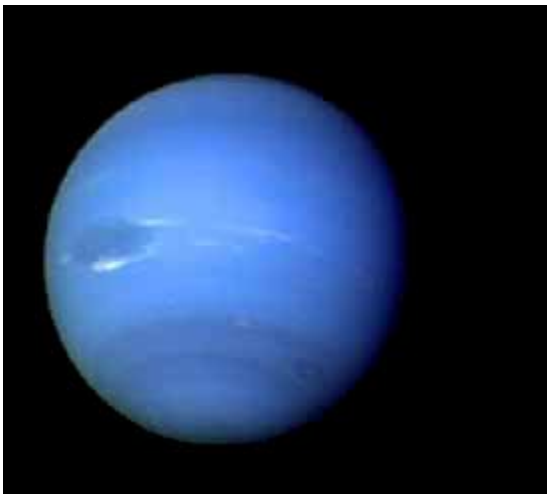
- Uranus is considered unusual because the planet rotates tilted on its side. The poles actually point towards the Sun. This is due to the fact that its magnetic field is tilted 60 degrees from the axis of rotation.
- Like Venus, Uranus spins from east to west, which is opposite from the spin of Earth.
- Uranus has more satellites (moons) than any other planet
- Uranus has rings that are composed of fine dust, rocks, and ice boulders. The rings are very faint and remained undiscovered until the Voyager 2 spacecraft visited the planet in 1986.
- Voyager 2 is the only spacecraft to have visited Uranus.
- Uranus is named after the Greek god of the sky. Uranus was the husband of Gaia, the goddess of the Earth
- Both Uranus and Saturn are large gaseous planets and both of them have rings

Neptune

1. What gas gives Neptune its blue color? Is there water on Neptune?
2. How big is Neptune compared to the rest of the planets? Which planets are larger than Neptune?
3. Is Neptune a rocky or gassy planet?

4. How fast can winds get on Neptune?
6. How long is a Neptune year in Earth years?
7. What is the location of Neptune in our Solar System?

Neptune



Location:	Eighth from Sun
Distance from Sun:	4,504,000,000 km (30.06 AU)
Neptune Day:	0.75 Earth Days
Neptune Year:	164.83 Earth Years
Orbital Speed:	5.4 km/sec
Eccentricity of Orbit:	0.0097
Satellites:	8 (plus rings)
Diameter:	49,528 km
Mass:	1.0247e26 kg
Major Atmospheric Gas:	Hydrogen

- Neptune is the fourth largest planet in the Solar System.
- The only spacecraft ever to visit Neptune was the Voyager 2 in 1989.

- Neptune is a gas planet, composed of hydrogen, helium, methane, with traces of ammonia and water.
 - The blue color of the planet is due to the absorption of red light by methane in the atmosphere.
 - Neptune has actually been the most distant planet from the sun since 1979, due the fact that Pluto's orbit is highly eccentric. Pluto will be the most distant planet from the again in 1999.
 - Neptune has the stronger winds than any other planet in the Solar System. Blowing in a westerly direction, winds on Neptune get up to 2,000 km/hour (1,200 miles/hour). "The Scooter" is a cloud that moves around Neptune about every 16 hours.
 - Neptune is the god of the sea in Roman Mythology.
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