Virtual Learning

Aerospace Engineering

Venus

May 6, 2020

Aerospace Engineering
Lesson: May 6, 2020

Objective/Learning Target:

Students will learn about Venus by exploring various aspects of planet.

Bell Work:

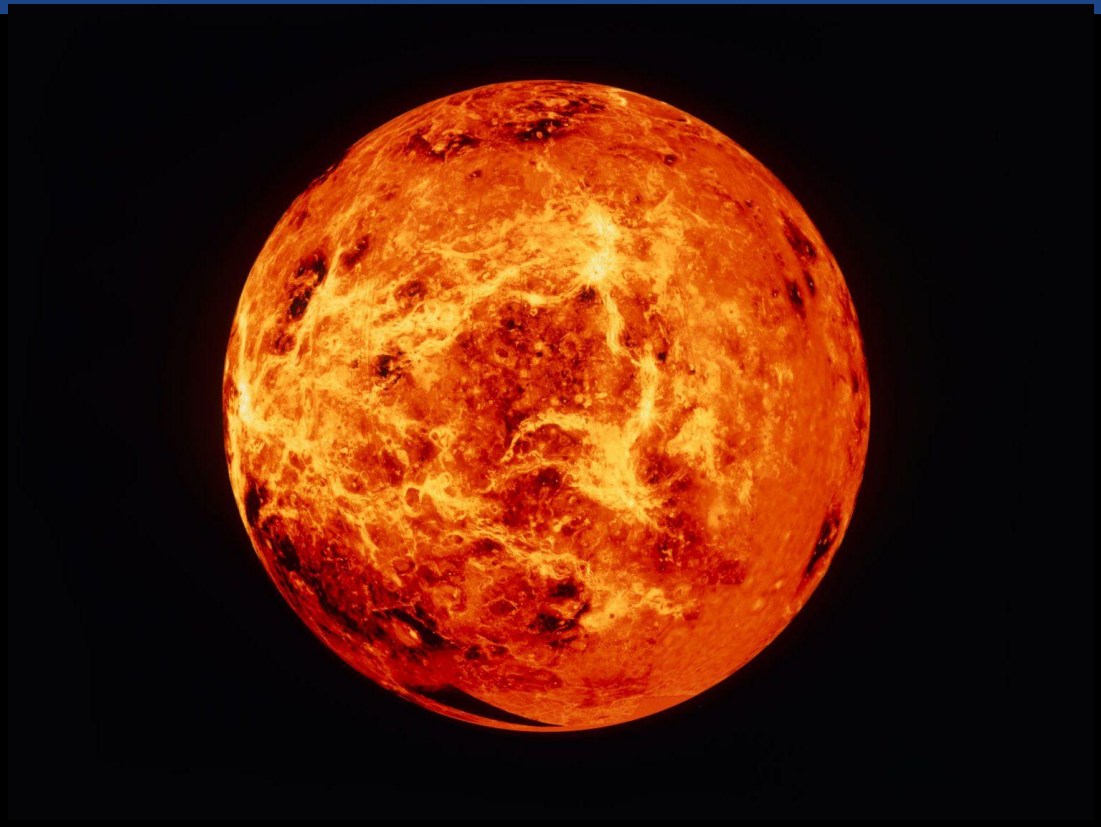
How far away is Venus from Earth?

Let’s Get Started:

Watch Videos:

- Venus 101 | National Geographic
- Venus: Crash Course Astronomy #14

Mercury




THE PLANETS
SUN
MERCURY
VENUS
EARTH
MARS
JUPITER
SATURN
URANUS
NEPTUNE
DISTANCE FROM THE SUN
57.91 million km
108.2 million km
149.6 million km
1227.9 million km
1778.5 million km
1.429 billion km
2.871 billion km
4.498 billion km

Venus is the second planet from the Sun and Earth's closest neighbor. Venus is similar in structure and size to Earth. It spins slowly in the opposite direction of most planets. Its thick atmosphere traps heat in a greenhouse effect, making it the hottest planet in our solar system. Its surface temperature is hot enough to melt lead. Brief looks below the clouds reveal volcanoes and deformed mountains.

Venus is named for the Roman goddess of love and beauty.

Venus has a radius of 3,760 miles, and is roughly the same size as Earth, just slightly smaller.

Venus is 0.7 astronomical units away from the Sun. One astronomical unit (AU), is the distance from the Sun to Earth. It takes sunlight 6 minutes to travel from the Sun to Venus.

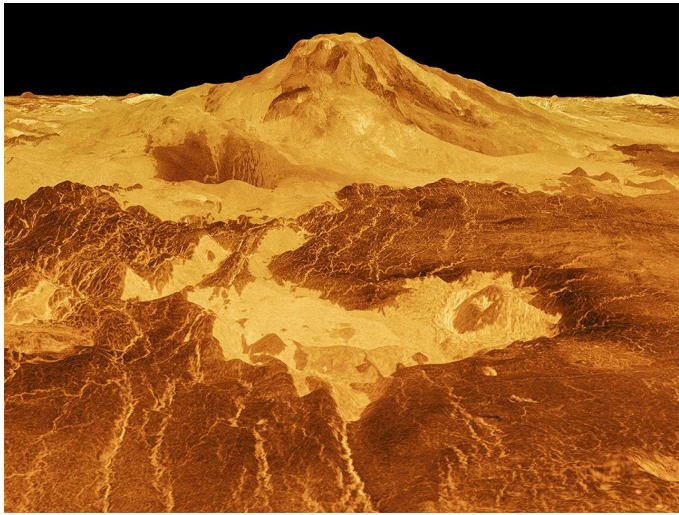
Venus' rotation and orbit are very unusual. Venus is one of just two planets that rotate from east to west. Only Venus and Uranus have this "backwards" rotation. Venus completes one rotation in 243 Earth days. This is the longest day of any planet in our solar system. The Sun doesn't rise and set each day on Venus like it does on other planets. On Venus, one day/night cycle takes 117 Earth days because it rotates in the direction opposite of its orbital revolution around the Sun.

Venus makes a complete orbit around the Sun in 225 Earth days. Its orbit around the Sun is the most circular of any planet, almost a perfect circle. Other planet's orbits are elliptical, or oval-shaped.

Venus is very similar to Earth in its structure. It has an iron core that is about 2,000 miles thick. Above that is a mantle made of hot rock that is slowly churning due to the planet's interior heat. The surface is a thin crust of rock that bulges and moves as Venus' mantle shifts and creates volcanoes.

When our solar system settled into its current layout about 4.5 billion years ago, Venus formed when gravity pulled swirling gases and dust together to form the planet. Venus has a central core, a rocky mantle and a solid crust.

From space, Venus looks bright white because it is covered with clouds that reflect and scatter sunlight. On the surface, the rocks are different shades of grey, but the thick atmosphere filters the sunlight so that everything looks orange if you were standing on Venus.



Venus has mountains, valleys, and thousands of volcanoes. The highest mountain on Venus, Maxwell Montes, is 20,000 feet high, which is similar to the highest mountain on Earth, Mount Everest. The surface is dusty, and temperatures reach a scalding 880 degrees Fahrenheit.

Venus is covered in craters, but none are smaller than 0.9 to 1.2 miles across. Small meteoroids burn up in the dense atmosphere, which means only large meteoroids can reach the surface and create impact craters.

Venus' atmosphere is made up of mainly carbon dioxide, with clouds of sulfuric acid droplets. The thick atmosphere traps the Sun's heat, resulting in surface temperatures higher than 880 degrees Fahrenheit. The atmosphere has many layers with different temperatures. At the level where the clouds are, about 30 miles up from the surface, it's about the same temperature as on the surface of the Earth.

As Venus moves in its solar orbit while slowly rotating backwards on its axis, the top level of clouds zips around the planet every four Earth days, driven by hurricane-force winds traveling at about 224 miles per hour. Atmospheric lightning bursts light up these quick-moving clouds.

On the surface, it would look like a very hazy, overcast day on Earth. And the atmosphere is so heavy it would feel like you were 1 mile underwater.

Even though Venus is close in size to the Earth and has a similarly-sized iron core, its magnetic field is much weaker than the Earth's because of Venus' slow rotation.

Venus has no rings.

Venus has no moons.

No human has ever visited Venus, but the spacecraft that have been sent to the surface of Venus do not last very long. Venus' high surface temperatures overheat electronics in spacecraft in a short time, so it is unlikely that a person could survive for long on its surface.

There is speculation about life existing in Venus' past, as well as questions about the possibility of life in the top cloud layers of Venus' atmosphere, where the temperatures are less extreme.

Venus Understanding

1. How big is Venus?
2. How far away is Venus from the Sun?
3. How far away is Venus from the Earth?
4. How long does it take light to travel from the Sun to Venus?
5. How many moons does Venus have?
6. How old is Venus?