

Venus: Beauty and Beast

A Reading A-Z Level V Leveled Book
Word Count: 1,253

Connections

Writing

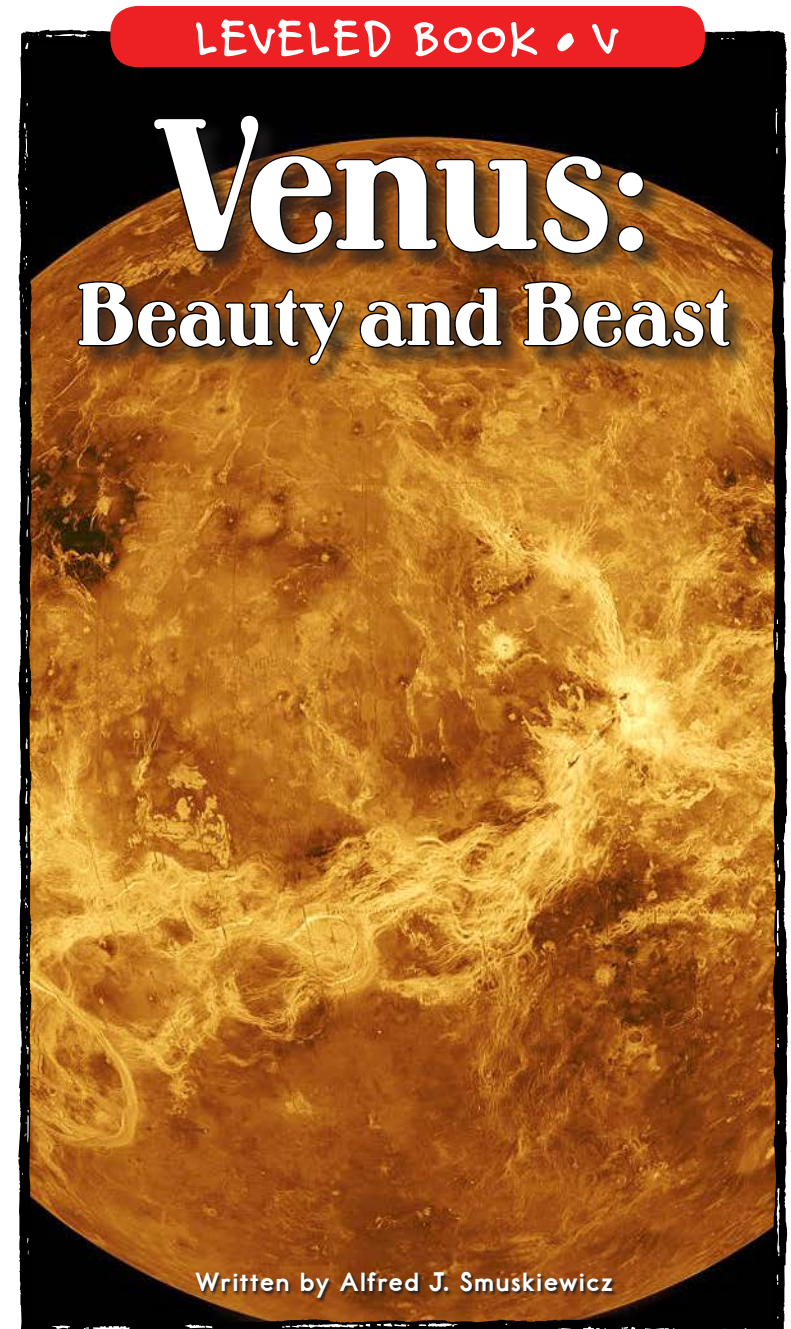
Create a Venn diagram comparing Venus to Earth. Then, write an essay explaining how the two planets are alike and different.

Science

Design an informational poster about Venus for your class. Include interesting facts and diagrams of the planet as well as its location in the solar system.

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Glossary

atmosphere (<i>n.</i>)	a layer of gases that surround a planet (p. 7)
equator (<i>n.</i>)	an imaginary line that circles the Earth halfway between the North and South Poles (p. 8)
hostile (<i>adj.</i>)	very unfriendly (p. 5)
lava (<i>n.</i>)	melted, liquid rock that flows from an opening in Earth's surface (p. 8)
meteorites (<i>n.</i>)	pieces of rock or metal that have landed on a planet's surface from outer space (p. 9)
opaque (<i>adj.</i>)	not see-through; blocking light from passing through (p. 11)
radar (<i>n.</i>)	a device that finds or monitors objects by sending out radio waves and picking them up after they reflect off the object (p. 13)
robotic (<i>adj.</i>)	of or relating to a device that is programmed to perform tasks (p. 11)
sulfuric acid (<i>n.</i>)	a strong, oil acid that is made by oxidizing sulfur dioxide (p. 7)
tropical (<i>adj.</i>)	of or relating to the geographic region around the equator that has a hot, humid climate (p. 11)

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Venus: Beauty and Beast

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Focus Question

Why might Venus be considered a fascinating planet?

Words to Know

atmosphere	opaque
equator	radar
hostile	robotic
lava	sulfuric acid
meteorites	tropical

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Correlation

LEVEL V	
Fountas & Pinnell	R
Reading Recovery	40
DRA	40



Conclusion

Venus caught the eyes of stargazers thousands of years ago. Outshining everything else in the sky—except for the Sun and Moon—it seemed to demand a special place of honor. Venus received this honor by being named after an ancient mythological goddess of love and beauty.

We honor Venus today by studying it with science, which has shed much light on this bright point in the heavens. Thanks to science, we know that Venus is a very special and strange kind of world. It is the hottest planet in the Solar System. It has some of the largest mountains and volcanoes found on any planet. It “rains” sulfuric acid.

People once thought that Venus was like Earth. We now know that Venus is as unlike Earth as another planet can possibly be. It’s a very hostile world where life as we know it is impossible. Yet, Venus undoubtedly possesses a strange beauty of its own. Both beauty and beast—that’s Venus!



An illustration of the Venus Express probe, launched by the European Union in 2005



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Do You Know?

Venus is the easiest planet to find. Because Venus is so close to the Sun, it is always near the Sun in the sky. Look for Venus low in the western sky just after sunset, or low in the eastern sky just before sunrise. If you look at Venus with strong binoculars or a telescope, you can see it go through phases like the Moon. You might see a "crescent Venus," a "half Venus," or a "full Venus."

Introduction

Venus is the brightest "star" in our night sky. People have admired this dazzling point of light for thousands of years. In ancient times, the Chinese named it Tai-pe (tie-PAY), meaning "beautiful white one." Today, we know this planet by the name the ancient Romans gave it—Venus, their goddess of love and beauty. Venus is the only planet named after a female figure.

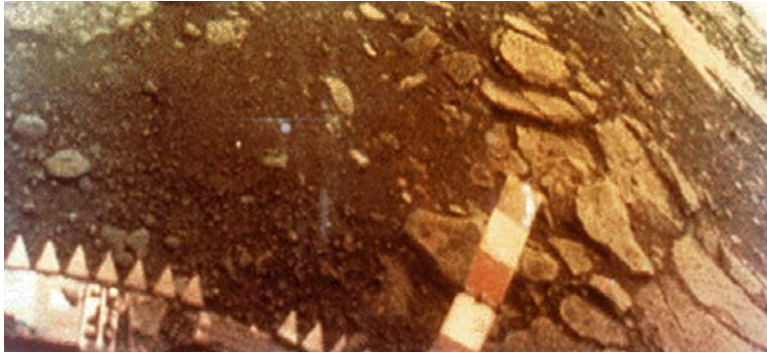
In the 1970s, two Pioneer probes from the United States traveled to Venus. One Pioneer orbited Venus, creating maps of the surface using **radar**. In radar, a special instrument sends out radio waves, which are then reflected off a surface. The time it takes for the waves to bounce back gives scientists information about the surface. Another Pioneer flew by Venus, studying its atmosphere with scientific instruments.

Scientists learned the most about Venus in the 1990s, when the U.S. Magellan probe orbited the planet. Magellan used an advanced type of radar to produce many pictures of the surface of Venus. For the first time, scientists could see the mountains, volcanoes, and other features of the surface in sharp detail.



The Magellan probe was carried into space aboard the shuttle *Atlantis*.

The European Union launched the Venus Express probe in 2005. Scientists used instruments on Venus Express to further study the planet's clouds and surface. Japan launched the Akatsuki orbiter in 2010 to study the planet's lightning and volcanoes.



Slabs of rock on Venus are seen in this photo taken by a Venera lander, part of which can also be seen.

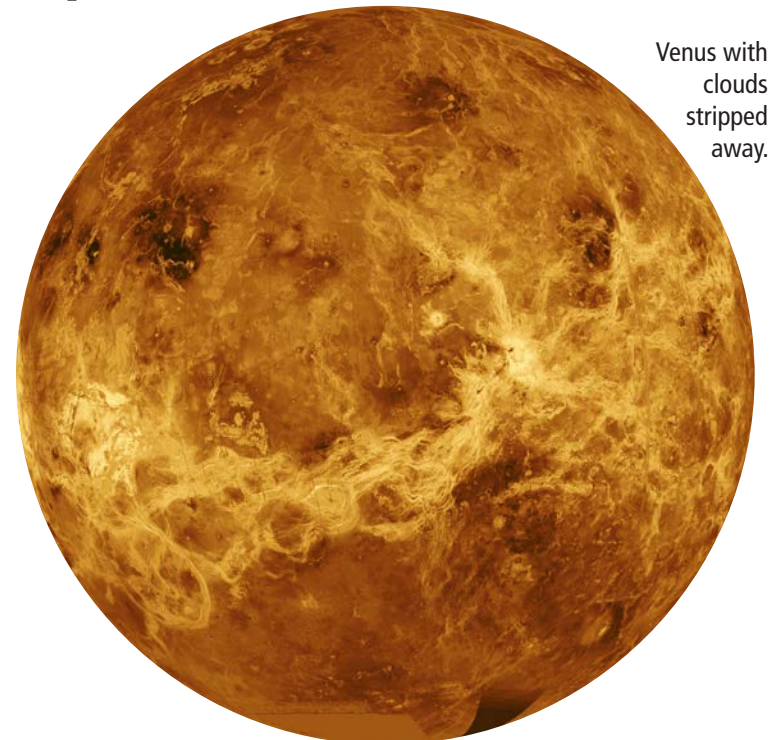
The Soviet Union (now called Russia) launched several space probes to Venus during the 1960s, 1970s, and 1980s. Some of these spacecraft, which were all named Venera, landed on Venus. The Venera landers took photographs of the planet's desertlike surface and radioed the pictures back to Earth. However, after only about an hour or two, the intense temperatures and pressures at the surface destroyed each Venera lander.

The U.S. National Aeronautics and Space Administration (NASA) has also sent space probes to Venus.



People long ago did not know that Venus is actually a planet with a hard, rocky surface like Earth. Venus has towering mountains, vast plains, enormous volcanoes, deep craters, and many other interesting features.

We know much more about Venus than people in ancient times did because scientists have studied Venus with telescopes and space probes. Unlike people thousands of years ago, we know that Venus is an extremely **hostile** place—more than six times hotter than the hottest place on Earth. Venus is a bizarre world that is part beauty and part beast!



Venus with clouds stripped away.



A Hot, Hostile World



Of the seven other planets of our solar system, Venus is the nearest one to Earth. It is the second planet from the Sun, while Earth is the third. Venus is also the planet that is closest in size to Earth. Venus is one of three planets that have solid, rocky surfaces like Earth, the others being Mercury and Mars. All the other planets are gigantic balls of gas and liquid.

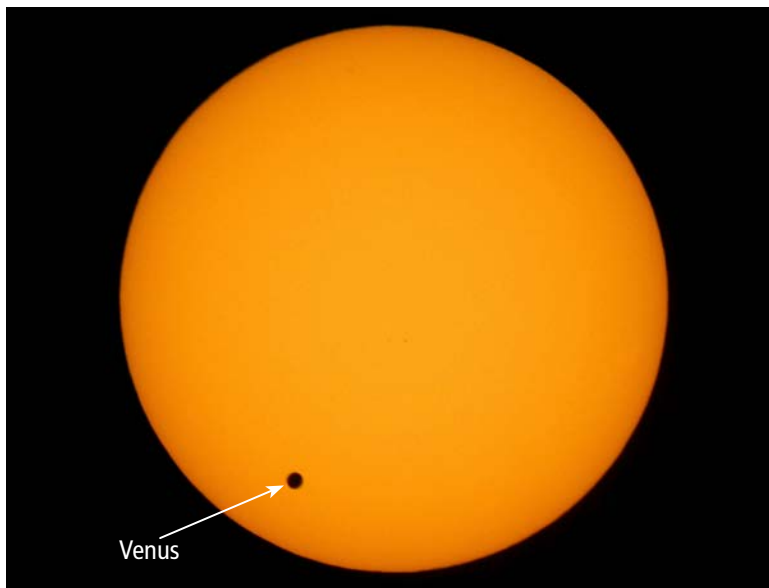
Although Venus has some similarities to Earth, it is a very different kind of planet than our world. The average temperature on Venus is 870°F (465°C)! The reason Venus is so scorching hot is because it is surrounded by a thick, soupy blanket of clouds that traps heat. This heat originally comes from the Sun, but the planet's surface reflects some of the Sun's heat upward. The thick clouds trap this reflected heat, just as the glass or plastic of a greenhouse traps heat to warm plants. This heating is called the *greenhouse effect*.

Visits to Venus

Many people once imagined that Venus was similar to some warm places on Earth. They wondered whether Venus might even have **tropical** jungles and swamps with such animals as snakes and crocodiles.

Looking at Venus through telescopes on Earth, scientists could not determine what the planet's surface was actually like. Telescopes are unable to show what lies beneath Venus's **opaque** clouds. Scientists knew next to nothing about Venus's surface until they sent **robotic** space probes there.

		How many miles apart is Venus from Earth? <i>Hint: Find the difference between how far each planet is from the Sun.</i>	
Venus			Earth
7,521	Diameter (miles)		7,926
67 million	Distance from Sun (miles)		93 million
225	Year length (Earth days)*		365
243 days	Day length (Earth time)†		24 hours
870° average	Temperature (°F)		-130° to 140°
0	Number of moons		1
* time it takes to orbit Sun		† time it takes to rotate on axis	



In 2004, people in some parts of the world were able to watch Venus as it passed directly between the Sun and Earth. Such an event can only be safely viewed indirectly or by using special “eclipse glasses.”

The clouds of Venus are part of its **atmosphere**, the gases that make up the air surrounding Venus. Venus’s atmosphere contains large amounts of a gas called *carbon dioxide*, which is very efficient at trapping heat. Many of the clouds of Venus also contain droplets of a substance called **sulfuric acid**. This oily compound is one of the strongest acids, and it can easily burn skin and dissolve metals. “Raindrops” of sulfuric acid sometimes fall from the clouds of Venus.

Layers of air can be very heavy, just as large amounts of water can be heavy. When something is heavy, it creates pressure. The atmosphere of Venus is so weighty that it produces tremendous pressure on the surface of the planet. If you were able to stand on the surface of Venus, this pressure would soon crush you.

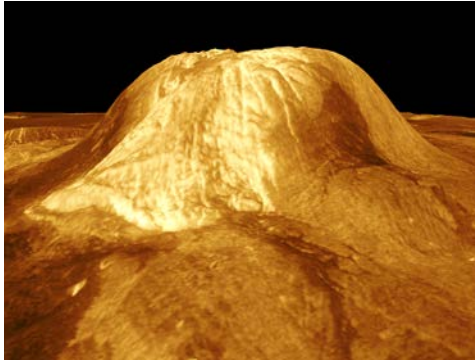


Earth’s Greenhouse Effect

Earth’s atmosphere also causes a greenhouse effect—though not as strong as the one on Venus. Because of this effect, Earth remains warm enough to have water and support life. However, scientists believe that the burning of coal, oil, and gas fuels is strengthening Earth’s greenhouse effect. When these fuels are burned, extra carbon dioxide is released into the air. This gas traps more heat near the surface, warming the planet more than its natural balance.

Fascinating Surface Features

Beneath its dense atmosphere, Venus has some of the most fascinating features discovered on any planet. There are massive mountain ranges on the surface of Venus. One of these is named Maxwell Montes—the only feature on Venus named after a man. This mountain range, which is near Venus's north pole, rises 7 miles (11.3 km) at its highest point. That is more than 1 mile (1.6 km) higher than Mount Everest, the highest place on Earth.



Gula Mons volcano on Venus

Venus also has thousands of huge volcanoes, some of which are more than 150 miles (240 km) wide. Many volcanoes are located on an elevated area of

land along Venus's **equator** named Aphrodite Terra. Aphrodite (AF-roh-DIE-tee) was the name of the goddess of love and beauty in ancient Greece.

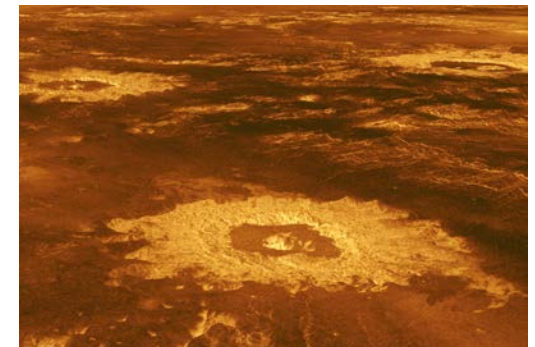
Most of the volcanoes on Venus erupted, shooting out hot **lava**, many millions of years ago. Scientists are still studying Venusian volcanoes for signs of recent eruptions.

The boiling lava that shot out of volcanoes long ago flowed across the surface of Venus. Today, much of the surface consists of flat plains of cooled, cracked, hardened lava.

There are also long, winding “riverbeds” on Venus. Scientists theorize that flowing lava carved out these channels millions of years ago. The riverbeds were probably not carved out by streaming water, as happens on Earth, because it is so hot on Venus that any water would evaporate into the atmosphere. However, if Venus was cooler in the past, then perhaps water might have existed on its surface long ago.

Venus has deep craters that formed billions of years ago when **meteorites** crashed into the planet's surface. Floods of lava covered up many of the craters on Venus, which is why Venus does not have as many impact craters as the Moon.

Because it is so hot and dry on Venus, almost all scientists agree that no living things could survive there.



A massive impact crater 43 miles (69 km) in diameter shows the damage meteors can do.