

## Facilitator Information

(All you need to know about Venus to survive the day)

Taken from <http://solarsystem.nasa.gov/planets/profile.cfm?Object=Venus&Display=Overview>

At first glance, if Earth had a twin, it would be Venus. The two planets are similar in size, mass, composition, and distance from the Sun.

But there the similarities end. Venus has no ocean. Venus is covered by thick, rapidly spinning clouds that trap surface heat, creating a scorched greenhouse-like world with temperatures hot enough to melt lead and pressure so intense that standing on Venus would feel like the pressure felt 900 meters deep in Earth's oceans. These clouds reflect sunlight in addition to trapping heat. Because Venus reflects so much sunlight, it is usually the brightest planet in the night sky.

Although we cannot normally see through Venus' thick atmosphere, NASA's Magellan spacecraft used radar to image the planet's surface, and the Galileo spacecraft used infrared mapping to view mid-level cloud structure before continuing on its mission to Jupiter.

The atmosphere consists mainly of carbon dioxide, with clouds of sulfuric acid droplets. Only trace amounts of water have been detected in the atmosphere. The thick atmosphere traps the Sun's heat, resulting in surface temperatures over 470 degrees Celsius (880 degrees Fahrenheit). Probes that have landed on Venus have not survived more than a few hours before being destroyed by the incredibly high temperatures.

The Venusian year (orbital period) is about 225 Earth days long, while the planet's rotation period is 243 Earth days, making a Venus day about 117 Earth days long. Venus rotates retrograde (east to west) compared with Earth's prograde (west to east) rotation. Seen from Venus, the Sun would rise in the west and set in the east. As Venus moves forward in its solar orbit while slowly rotating "backwards" on its axis, the cloud-level atmosphere zips around the planet in the opposite direction from the rotation every four Earth days, driven by constant hurricane-force winds. How this atmospheric "super rotation" forms and is maintained continues to be a topic of scientific investigation.

About 90 percent of the surface of Venus appears to be recently solidified basalt lava – the same type of rock that makes up Earth's deep ocean floor and Hawaii. Based on the relatively few craters on the surface of Venus, scientists suggest that the planet was completely resurfaced by volcanic activity 300 to 500 million years ago. At that time, lava filled in the craters and other features on the surface of Venus, making the surface smooth. Venus has not had enough time – only 300 to 500 million years! – to accumulate lots and lots of craters on its surface.

Sulfur compounds, possibly attributable to volcanic activity, are abundant in Venus' clouds. The corrosive chemistry and dense, moving atmosphere cause significant surface weathering and erosion. Radar images of the surface show wind streaks and sand dunes. Craters smaller than 1.5 to 2 kilometers (0.9 to 1.2 miles) across do not exist on Venus, because small meteors burn up in the dense atmosphere before they can reach the surface.

More than 1,000 volcanoes or volcanic centers larger than 20 kilometers (12 miles) in diameter dot the surface of Venus. Volcanic flows have produced long, sinuous channels extending for hundreds of kilometers. Venus has two large highland areas: Ishtar Terra, about the size of Australia, in the north polar region; and Aphrodite Terra, about the size of South America. These straddle the equator and extend for almost 10,000 kilometers (6,000 miles). Maxwell Montes, the highest mountain on Venus and comparable to Mount Everest on Earth, is at the eastern edge of Ishtar Terra.

Venus has an iron core about 3,000 kilometers (1,200 miles) in radius. Venus has no global magnetic field, though its core iron content is similar to that of Earth.

