

A Giant Among

Jupiter's high winds circle the planet and cause cloud bands to form. Storms, such as the Great Red Spot shown here, form between the cloud bands.

Statistics Table for Jupiter	
Distance from the sun	5.20 AU
Period of rotation	9 h 55 min
Period of revolution	11.86 y
Tilt of axis	3.13°
Diameter	142,984 km
Density	1.33 g/cm ³
Mean surface temperature	-150 °C
Surface gravity	253% of Earth's gravity
Number of satellites	65



Ganymede



Callisto

What is a gas giant planet?

Jupiter, Saturn, Uranus, and Neptune are the gas giant planets. They orbit far from the sun. **Gas giants** have deep, massive gas atmospheres, which are made up mostly of hydrogen and helium. Unlike Earth, these planets have no surface to stand on. They are simply tremendous balls of gas that grow denser the deeper you travel inside. All of the gas giants are large. Neptune, the smallest gas giant planet, is big enough to hold 60 Earths within its volume. The gas giant planets are cold. Mean surface temperatures range from -150 °C on Jupiter to -220 °C on Neptune.

What is known about Jupiter?

Jupiter (JOO•pih•ter) is the largest planet in the solar system. Its volume can contain more than 900 Earths. Jupiter is also the most massive planet. Its mass is twice that of the other seven planets combined. Jupiter has the highest surface gravity in the solar system at 253% that of Earth. And, although all of the gas giant planets rotate rapidly, Jupiter rotates the fastest of all. Its period of rotation is just under 10 h. Wind speeds on Jupiter are high. They can reach 540 km/h. By contrast, Earth's wind speed record is 372 km/h.

Active Reading

5 Identify As you read the text, underline important physical properties of the planet Jupiter.

Giants!



Io



Europa

Io, Europa, Callisto, and Ganymede are Jupiter's largest moons. All four moons were named for figures in Greek mythology.

Huge Storms Travel Across Jupiter's Surface

Jupiter has some of the strangest weather conditions in the solar system. The winds on Jupiter circle the planet. Clouds are stretched into bands that run from east to west. Storms appear as white or red spots between cloud bands. The best known of these storms is the Great Red Spot. The east-west width of this storm is three times the diameter of Earth. Incredibly, this storm has been observed by astronomers on Earth for the past 350 years.

Jupiter Has the Most Moons

More than 60 moons have been discovered orbiting Jupiter. This is the greatest number of moons to orbit any planet. Jupiter's moons Io (EYE•oh), Europa (yu•ROH•puh), Callisto (kuh•LIS•toh), and Ganymede (GAN•uh•meed) are particularly large. In fact, Ganymede is larger than the planet Mercury.

Jupiter's moon Io is the most volcanically active place in the solar system. There are at least 400 active volcanoes on Io's surface. Jupiter's gravity tugs and pulls on Io. This causes the interior of Io to reach the temperature at which it melts. Lava erupts from Io's volcanoes, which throw tremendous geysers of sulfur compounds into space. Over time, the orbit of Io has become a ring of ejected gases that is visible to the Hubble Space Telescope.

Jupiter's moon Europa has an icy surface. Recent evidence suggests that an ocean of liquid water may lie beneath this surface. Because liquid water is essential for life, some scientists are hopeful that future spacecraft may discover life inside Europa.

6 Apply Io, Europa, Callisto, and Ganymede are known as the *Galilean moons*. The astronomer Galileo discovered these moons using one of the first telescopes. Why do you think that the Galilean moons were the first objects to be discovered with a telescope?

Think Outside the Book

7 Model Select one of the following topics about weather on Jupiter to research: belts and zones; jet streams; storms. Present your findings to the rest of the class in the form of a model. Your model may be handcrafted, or may be an art piece, or may be a computer presentation.