



Virtual Learning

# Aerospace Engineering

**Neptune**

May 14, 2020



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## Lesson: May 14, 2020

### **Objective/Learning Target:**

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



## **Bell Work:**

How far away is Neptune from Earth?

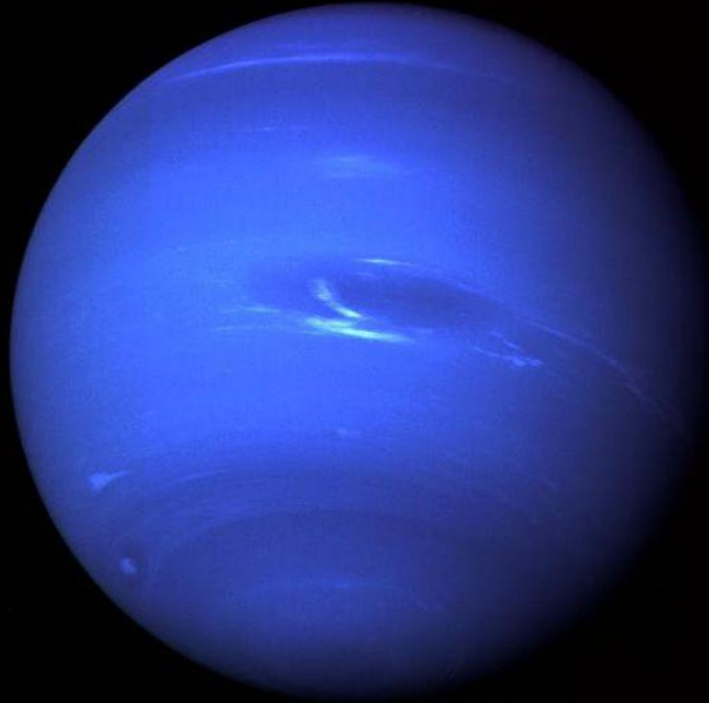


## Let's Get Started:

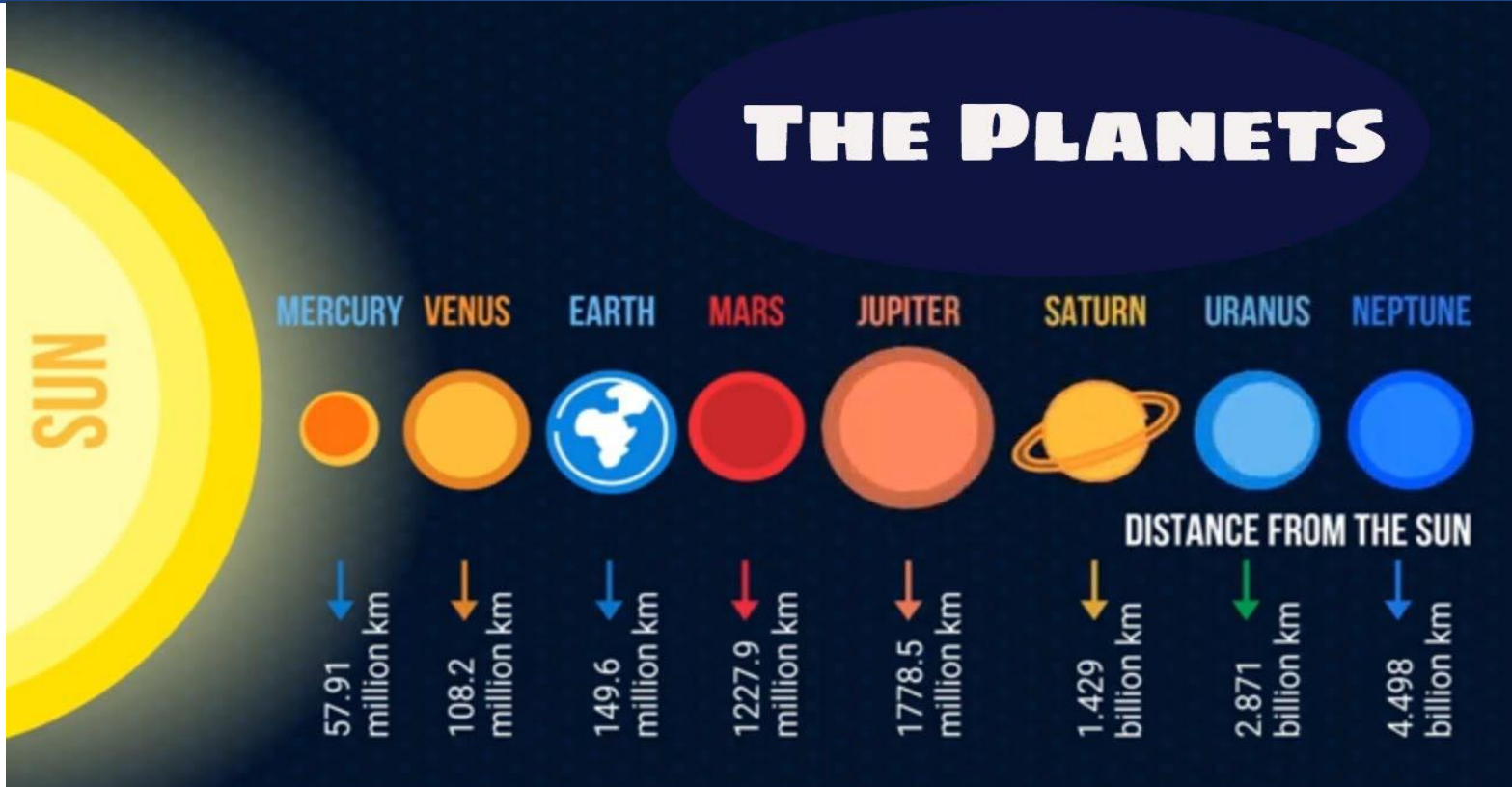
### Watch Videos:

- [Neptune 101 | National Geographic](#)
- [Our Solar System's Planets: Neptune](#)

# Neptune



# THE PLANETS





Neptune is dark, cold and has supersonic winds. It is the eighth and most distant planet from the sun in our solar system. It is more than 30 times as far from the Sun as Earth is. Neptune is the only planet in our solar system not visible to the naked eye.

Neptune is so far from the Sun that noon on the big there would seem like dim twilight to us. The light that we see here on Earth is roughly 900 times as bright as sunlight on Neptune.

The ice giant Neptune was the first planet located through mathematical calculations. Using predictions made by Urbain Le Verrier, Johann Galle discovered the planet in 1846. The planet is named after the Roman god of the sea.



Neptune has a radius of 15,299.4 miles. It is about four times wider than Earth.

Neptune is 30 astronomical units (AU) away from the Sun. From this distance, it takes sunlight 4 hours to travel from the Sun to Neptune.





One day on Neptune takes about 16 hours. Neptune makes a complete orbit around the Sun (a year in Neptunian time) in about 165 Earth years (60,190 Earth days).

Neptune is one of two ice giants in our solar system (the other is Uranus). Most (at least 80% or more) of the planet's mass is made up of a hot dense fluid of "icy" materials, water, methane and ammonia, that surrounds a small, rocky core.

Scientists think there might be an ocean of super hot water under Neptune's cold clouds. It does not boil away because incredibly high pressure keeps it locked inside.



Neptune took shape when the rest of the solar system formed about 4.5 billion years ago, when gravity pulled swirling gas and dust in to become this ice giant. Like its neighbor Uranus, Neptune likely formed closer to the Sun and moved to the outer solar system about 4 billion years ago.

Neptune does not have a solid surface. Its atmosphere extends to great depths, gradually merging into water and other melted ices over a heavier, solid core with about the same mass as Earth.





Neptune's atmosphere is made up mostly of hydrogen and helium with just a little bit of methane.

Neptune is our solar system's windiest planet. Despite its great distance and low energy input from the Sun, Neptune's winds can be three times stronger than Jupiter's and nine times stronger than Earth's. These winds whip clouds of frozen methane across the planet at speeds of more than 1,200 miles per hour. Earth's most powerful winds hit only about 250 miles per hour.

In 1989 a large, oval-shaped storm in Neptune's southern hemisphere dubbed the "Great Dark Spot" was large enough to contain the entire Earth. That storm has since disappeared, but new ones have appeared on different parts of the planet.



Neptune has 14 known moons. Neptune's largest moon Triton was discovered on October 10, 1846, just 17 days after Johann Gottfried Galle discovered the planet. Since Neptune was named for the Roman god of the sea, its moons are named for various lesser sea gods and nymphs in Greek mythology.

Triton is the only large moon in the solar system that circles its planet in a direction opposite to the planet's rotation. That suggests that it may once have been an independent object that Neptune captured. Triton is extremely cold, with surface temperatures around minus 391 degrees Fahrenheit. Despite the deep freeze at Triton, Voyager 2 discovered geysers spewing icy material upward more than 5 miles. Triton's thin atmosphere, has been detected from Earth several times since, and is growing warmer, yet scientists do not yet know why.

Neptune's environment is not conducive to life as we know it. The temperatures, pressures and materials that characterize this planet are more than likely too extreme and volatile for any organisms to adapt to.



# Neptune Understanding

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