

Chapter Twenty-One: The Solar System

Lesson 3: The Outer Planets

The outer planets are called gas giants because they are primarily made of hydrogen and helium (these elements are gases on Earth).

- Have strong gravitational forces due to their large masses.
 - This strong gravity creates tremendous atmospheric pressure that changes gases to liquids.
- Have a thick gas and liquid layer covering a small, solid core.



Jupiter:

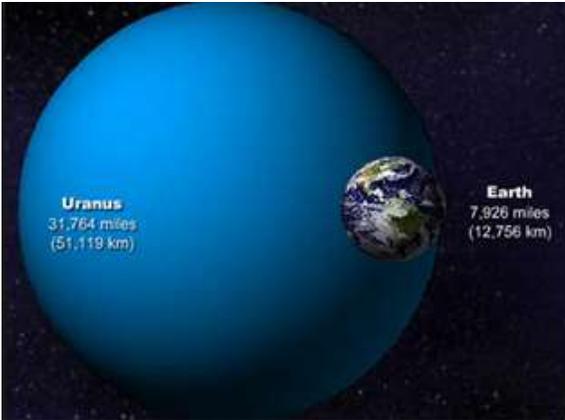
- The largest planet in the solar system.
 - 11 times larger than the diameter of Earth.
- Its mass is more than twice the mass of all the other planets combined.
- 1,000 Earths would fit within this gaseous planet's volume.
- Takes almost 12 Earth years to complete one orbit. (11.9 years)
- Period of rotation is 10 hours...spins faster than any other planet.
- Because it rotates quickly, the clouds stretch into colorful, swirling bands.
 - The Great Red Spot is a storm of swirling gases.
- Liquid of hydrogen above the core.
 - Scientists think the core is made of rock and iron.
- Jupiter has 63 moons!
 - **Galilean moons:** the four largest moon of Jupiter
 - Io, Europa, Ganymede, and Calisto
 - Made of rock and ice



Saturn:

- It is the least dense planet...density is less than that of water.
- Made mostly of hydrogen and helium and small amount of other material.
- Outer gas layer, thick layer of liquid hydrogen, and a solid core.

- Has a very complex ring system...has 7 bands of rings.
- Has 60 moons!
 - 5 large moons (Titan, Rhea, Dione, Iapetus, and Tethys).
 - Titan is larger than the planet Mercury.



Uranus:

- Atmosphere of hydrogen, helium, and a small amount of methane.
 - Beneath this layer of gas, is a thick, slushy layer of water, ammonia, and other material.
 - Has a solid, rocky core.
 - Spins on its side...tilted so that the planet moves around the Sun like a ball.
- Has 27 moons...2 large moons (Titania and Oberon)
 - Titania has an icy cracked surface that was once to be covered by an ocean.



Neptune:

- Atmosphere of hydrogen, helium, and a small amount of methane (like Uranus).
 - Interior is partially frozen water and ammonia with a rock and iron core.
 - Has 13 moons and a faint, dark ring system.
- Largest moon, Triton, is made of rock with an icy outer layer.
 - Its surface is made of frozen nitrogen and geysers that erupt nitrogen gas.