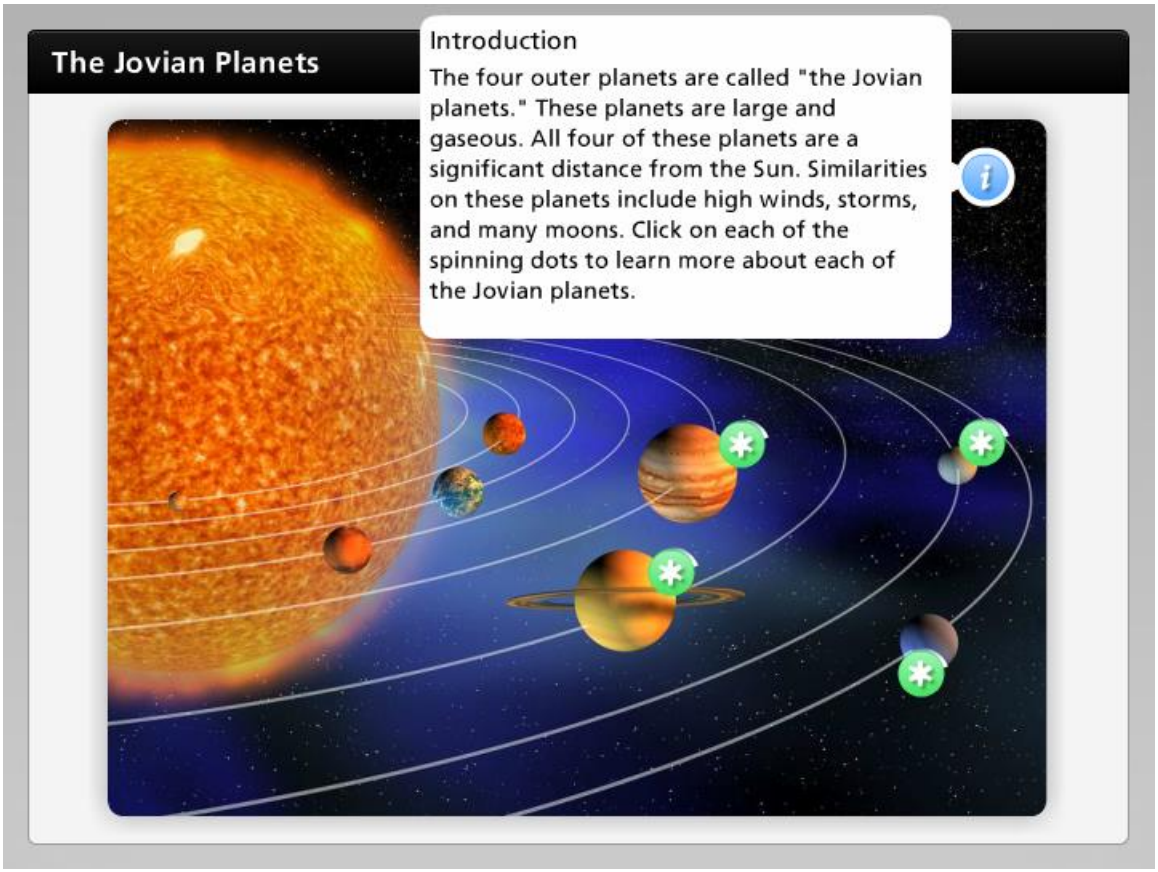
Module 4: Astronomy – The Solar System
Topic 4 Content: The Jovian Planets Notes

Introduction



The four outer planets are called "the Jovian planets." These planets are large and gaseous. All four of these planets are a significant distance from the Sun. Similarities on these planets include high winds, storms, and many moons. Click on each of the spinning dots to learn more about each of the Jovian planets.

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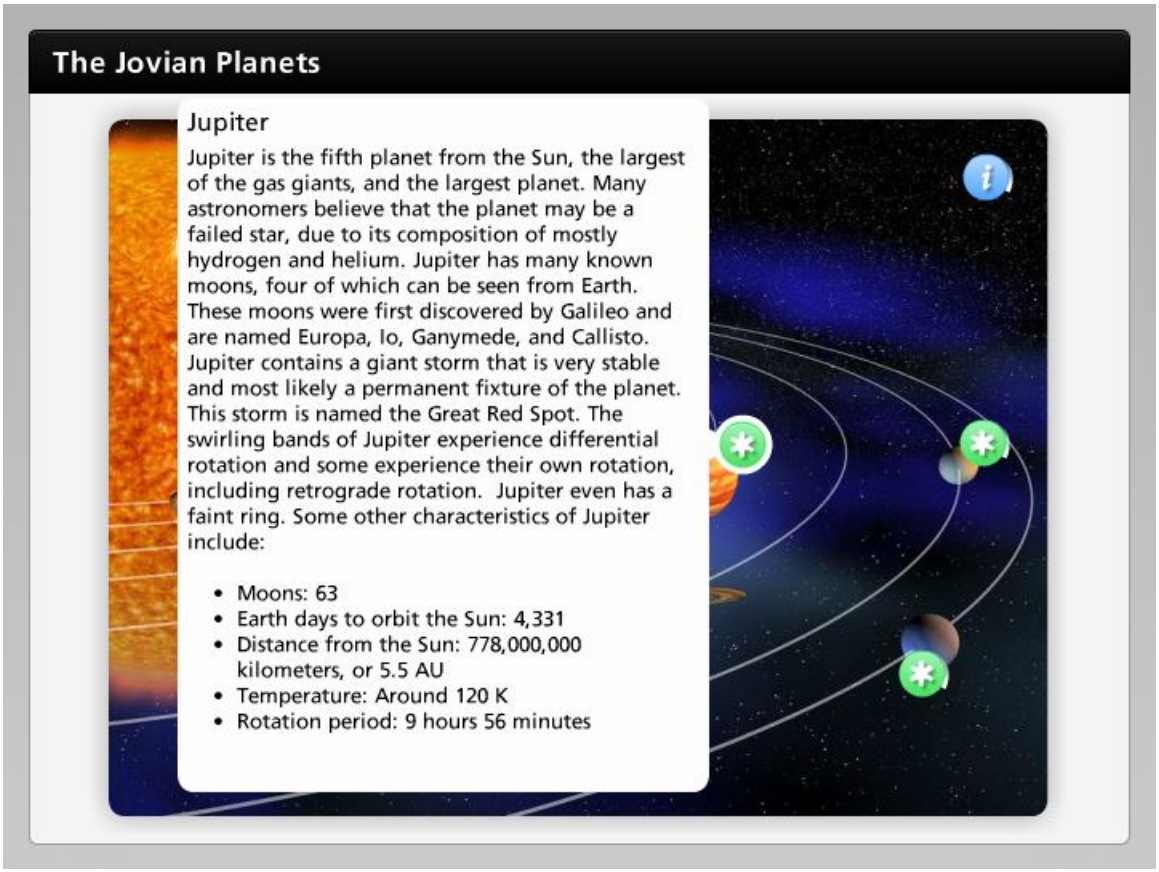
Jupiter



Jupiter is the fifth planet from the Sun, the largest of the gas giants, and the largest planet. Many astronomers believe that the planet may be a failed star, due to its composition of mostly hydrogen and helium. Jupiter has many known moons, four of which can be seen from Earth. These moons were first discovered by Galileo and are named Europa, Io, Ganymede, and Callisto. Jupiter contains a giant storm that is very stable and most likely a permanent fixture of the planet. This storm is named the Great Red Spot. The swirling bands of Jupiter experience differential rotation and some experience their own rotation, including retrograde rotation. Jupiter even has a faint ring. Some other characteristics of Jupiter include:

- Moons: 63
- Earth days to orbit the Sun: 4,331
- Distance from the Sun: 778,000,000 kilometers, or 5.5 AU
- Temperature: Around 120 K
- Rotation period: 9 hours 56 minutes

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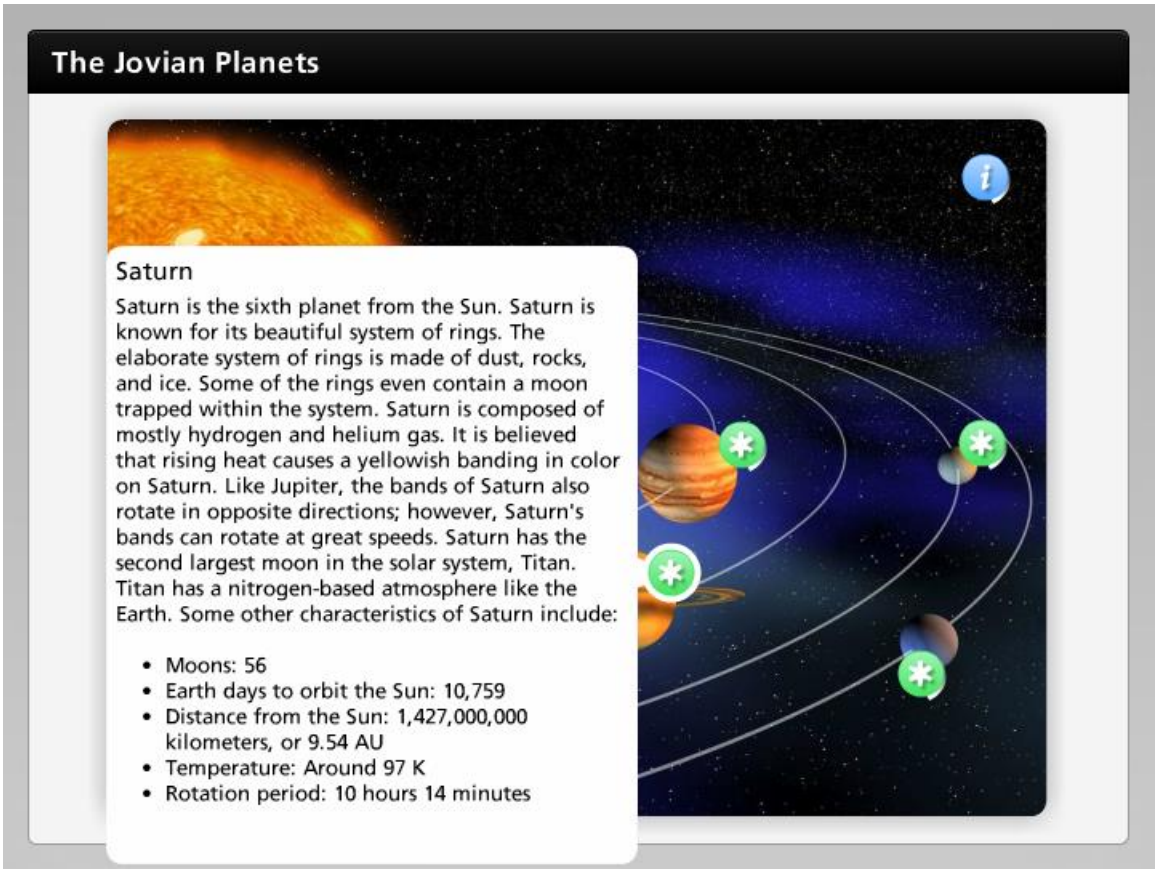
Saturn



Saturn is the sixth planet from the Sun. Saturn is known for its beautiful system of rings. The elaborate system of rings is made of dust, rocks, and ice. Some of the rings even contain a moon trapped within the system. Saturn is composed of mostly hydrogen and helium gas. It is believed that rising heat causes a yellowish banding in color on Saturn. Like Jupiter, the bands of Saturn also rotate in opposite directions; however, Saturn's bands can rotate at great speeds. Saturn has the second largest moon in the solar system, Titan. Titan has a nitrogen-based atmosphere like the Earth. Some other characteristics of Saturn include:

- Moons: 56
- Earth days to orbit the Sun: 10,759
- Distance from the Sun: 1,427,000,000 kilometers, or 9.54 AU
- Temperature: Around 97 K
- Rotation period: 10 hours 14 minutes

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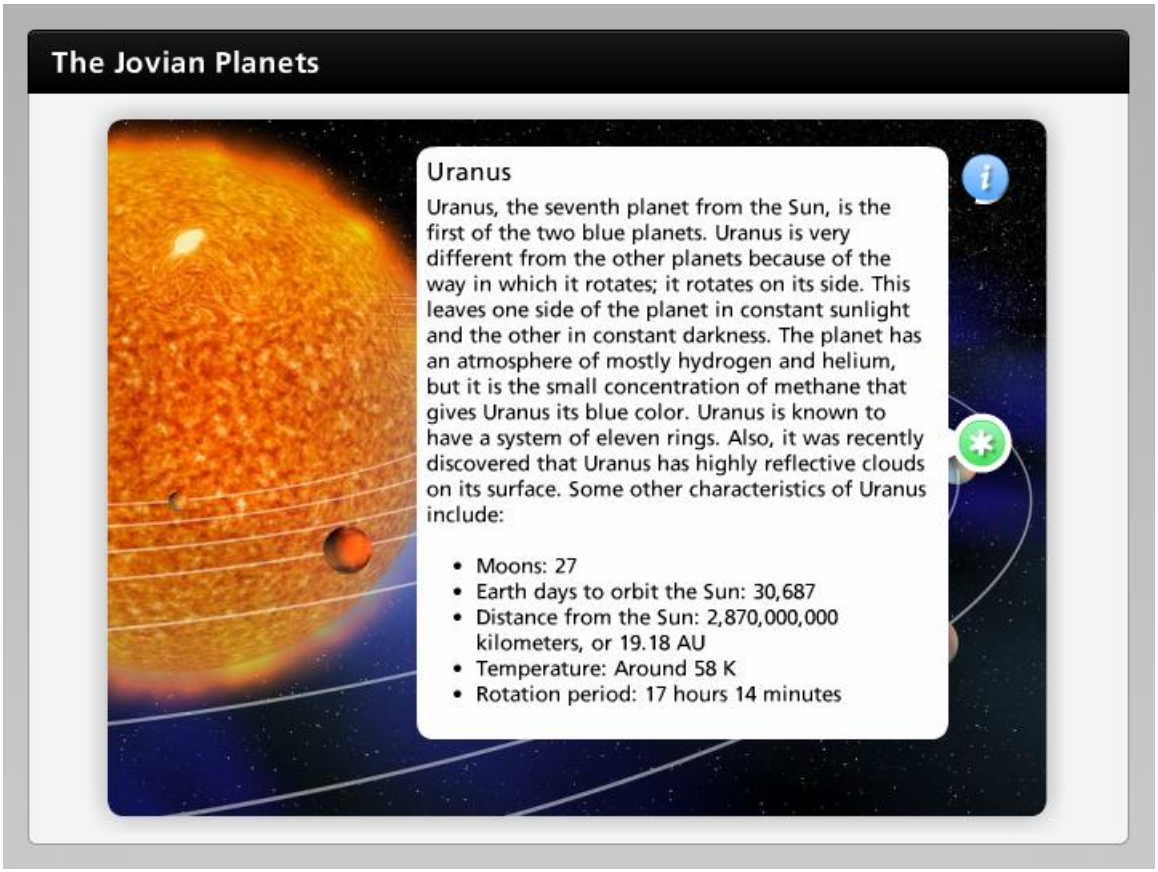
Uranus



Uranus, the seventh planet from the Sun, is the first of the two blue planets. Uranus is very different from the other planets because of the way in which it rotates; it rotates on its side. This leaves one side of the planet in constant sunlight and the other in constant darkness. The planet has an atmosphere of mostly hydrogen and helium, but it is the small concentration of methane that gives Uranus its blue color. Uranus is known to have a system of eleven rings. Also, it was recently discovered that Uranus has highly reflective clouds on its surface. Some other characteristics of Uranus include:

- Moons: 27
- Earth days to orbit the Sun: 30,687
- Distance from the Sun: 2,870,000,000 kilometers, or 19.18 AU
- Temperature: Around 58 K
- Rotation period: 17 hours 14 minutes

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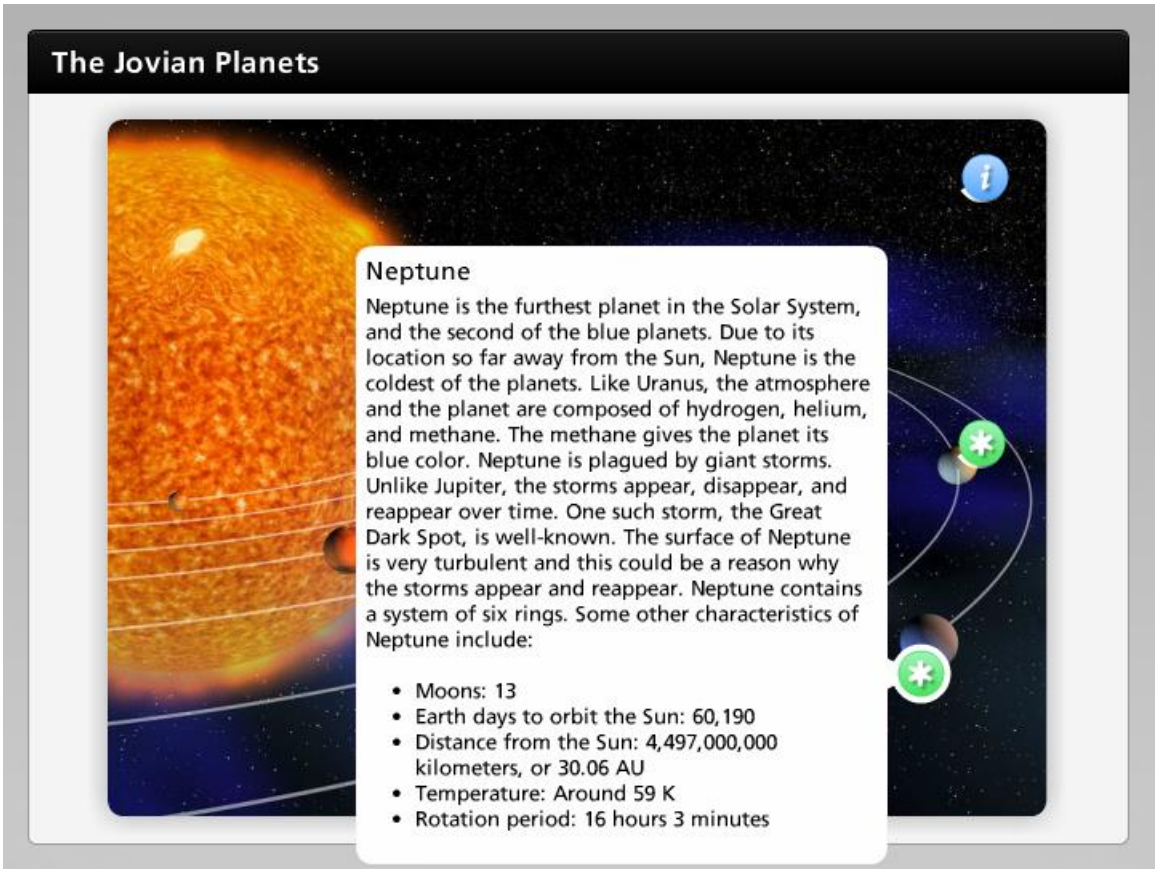
Neptune



Neptune is the furthest planet in the Solar System, and the second of the blue planets. Due to its location so far away from the Sun, Neptune is the coldest of the planets. Like Uranus, the atmosphere and the planet are composed of hydrogen, helium, and methane. The methane gives the planet its blue color. Neptune is plagued by giant storms. Unlike Jupiter, the storms appear, disappear, and reappear over time. One such storm, the Great Dark Spot, is well-known. The surface of Neptune is very turbulent and this could be a reason why the storms appear and reappear. Neptune contains a system of six rings. Some other characteristics of Neptune include:

- Moons: 13
- Earth days to orbit the Sun: 60,190
- Distance from the Sun: 4,497,000,000 kilometers, or 30.06 AU
- Temperature: Around 59 K
- Rotation period: 16 hours 3 minutes