

## **NOTES: Outer Planets**

1. The outer planets are known as a gas giant.
2. GAS GIANTS- are planets that have deep, massive atmospheres rather than hard and rocky surfaces like the inner planets.

### **JUPITER: A GIANT AMONG GIANTS**

1. The largest planet in our solar system.
2. Like the sun it is made up of mostly hydrogen and helium.
3. The outer part of Jupiter's atmosphere is made up of layered clouds of water, methane, and ammonia.
4. The pressure in Jupiter's atmosphere is high enough to change hydrogen gas into a liquid.
5. Jupiter radiates much more energy into space than it receives from the sun.
6. This is because Jupiter's interior is VERY hot.
7. The giant red spot- a 400 year old storm that is 3 times the diameter of Earth.

### **NASA MISSIONS TO JUPITER.**

1. NASA has sent five missions to Jupiter.
2. two pioneer missions, two voyager missions, and the Galileo mission.
3. The voyager 1 and 2 spacecraft missions reveals a thin faint ring around Jupiter.
4. The Voyager missions gave us the first detailed images of Jupiter's moons.
5. The Galileo spacecraft reached Jupiter in 1995 and sent a probe into Jupiter's atmosphere.
6. It sent back data on Jupiter's composition, temperature, and pressure.

## **SATURN: STILL FORMING**

1. The second largest planet in the solar system.
2. It has 764 times the volume of Earth and is 95 times more massive than Earth.
3. It is mostly hydrogen and helium like Jupiter.
4. Saturn like Jupiter gives off much more energy than it receives. from the sun
5. Scientists feel that all of this extra energy comes from helium falling out of the atmosphere and sinking to the core.
6. In other words scientists feel that Saturn is still forming.

## **THE RINGS OF SATURN**

1. Although all of the gas giants have rings Saturn's are the largest.
2. Saturn's rings have a diameter of 272,000 km.
3. they are only a few hundred meters thick.
4. They are made up of ice particles that range from a few centimeters to several meters wide.

## **NASA'S EXPLORATION OF SATURN**

1. The Cassini spacecraft reached Saturn in 2004.
2. It transmitted detailed color images.
3. during the four years that followed Cassini gathered data on Saturn' ring system, moons, and magnetic field.

## **URANUS: A SMALL GIANT**

1. Discovered by William Herschel in 1781.
2. The atmosphere is mainly hydrogen and methane.
3. Because these gasses absorb the sunlight very strongly, the planet appears blue-green.

## **A TILTED PLANET**

1. Unlike most planets it is tipped over on its side.
2. So for part of a Uranus year, one pole points towards the sun, while the other sun is in darkness.
3. Scientists believe that early on in its history a massive object could have hit it and that is what possibly tipped it over.
4. They believed this because the poles are reversed.

## **NEPTUNE: THE BLUE WORLD**

1. It was discovered in 1846.

### **THE ATMOSPHERE OF NEPTUNE**

1. The Voyager 2 spacecraft sent back images that provided much new information about Neptune's atmosphere.
2. Its composition is similar to Uranus's atmosphere.
3. Neptune has belts of clouds that are visible.
4. During the visit of Voyager 2 to Neptune there was a Great Dark Spot similar to the Great Red Spot on Jupiter.
5. Like the interiors of Jupiter and Uranus Neptune's interior releases thermal energy into its outer layers.
6. This release of energy helps the warm gases to rise and the cool gases to sink, which sets up the wind patterns in the atmosphere creates the belts of clouds.
7. The Voyager 2 also revealed that Neptune ha a very narrow set of rings.

## **PLUTO: A DWARF PLANET**

1. It was discovered in 1930.
2. It has been called the 9th planet.
3. But since it does not meet all of the conditions required to be classified as a planet, it has been reclassified as a dwarf planet.

4. Pluto is less than half the size of Mercury, and is made mostly of ice and rock.
5. Scientists believe that Pluto is covered by frozen nitrogen and has a thin atmosphere of methane.
6. Pluto's moon Charon (keruhn), is covered by frozen water and is more than half of Pluto's size.
7. Charon is the largest moon in relation to its planet in the solar system.
8. Neither Pluto or its moon have eve been visited by NASA on a mission.

## **OTHER DWARF PLANETS**

1. The discovery of an object called Eris has challenged Pluto's classification even further since it is even larger than Pluto and still not considered a planet.
2. Like Pluto Eris has not yet cleared its orbit of debris and so it is also classified as a dwarf planet.
3. DWARF PLANET- any object that orbits the sun, is round, because of its own gravity, b has not cleared its orbital path.
4. Ceres is another object that has been reclassified as a dwarf planet.
5. It was previously classified as an asteroid.