

The Solar System consists of 3 kinds of planets:

The **Terrestrial** planets include Mercury, Venus, Earth, and Mars. These are Earth-like planets that are small, dense, rocky worlds with less atmosphere than Giant planets.

The Jovian planets include Jupiter, Saturn, Uranus, and Neptune. They do not have a solid surface and consist mainly of hydrogen and helium gas.

Dwarf planets include <u>Ceres</u>, <u>Pluto</u>, <u>Haumea</u>, <u>Makemake</u>, and <u>Eris</u>. These planets are smaller than the Jovian and Terrestrial planets. They have solid surfaces, but not as dense as Terrestrial planets **<u>Density</u>** is a key measure of the material which comprises a planet.

It is a measure of how much matter is packed into a volume of space.

$$Density = \frac{mass}{volume}$$

Examples: water $(H_2O) - 1 \text{ g/cm}^3$ lce - 0.92 g/cm³granite - 2.7 g/cm³Basalt 2.9 g/cm³iron - 7.8 g/cm³Earth - 5.5 g/cm³

Terrestrial planets have high density (4-6) g/cm³, **Jovian** planets have low density (1-1.5) g/cm³ <u>Planets also rotate and revolve.</u> Planets spin on their axis or rotate .

The period of rotation determines the length of a day.

The inclination of a planet's rotation axis will determine its seasons.

Planets also revolve about the Sun. The period of revolution determines the length of a year for that planet.

Planets further from the Sun revolve more slowly than those closest to the Sun.

The Solar System



Typical features on the surfaces of planets and moons

Impact Craters Volcanoes Ice Rivers Mountains

Volcanoes: this is how volcanoes look from earth





Eruption of St.Helens

Signs of rainfall: radial features

Volcanoes: this is how volcanoes look from space

Galapagos Islands



Volcanoes:

Mars: Mount Olympus





Colorado river from earth and from space



Rivers:



Rivers:

Dry river beds on Mars



Dry river bed

Ice: Antarctica



Mars



Icebergs:

Antarctica





Arizona





Arizona



The same impact crater viewed from space

Nature





Nature







Impact craters Moon



Impact craters Mars



The Moon

The Moon is 25% of the Earth's diameter. Its density is 3.4 g/cm^3 implying a mostly rocky core (vs. metallic core for the Earth).

It does not have any atmosphere.

Distance from Earth: 384,600 km (238,900 mi). That is 60 radii of the Earth

Mass: 0.012 Mass-of-Earth

Apollo 17, December 1972



Apollo 17



Apollo 17





Apollo II - 1969 First landing of humans on the Moon













Volcanic features:





Tectonic features: faults due to stresses produced by extensive lava flows



Long cracks due to extension stresses

Compression ridges



Moon



KARL TATE, SPACE.com

SOURCE: NASA

Volcanic features:



The Mercury

Mercury is a heavily cratered planet closest to the Sun. In some ways, it most resembles the Moon. The density of Mercury is 5.4 gm/cm³.

Distance to the Sun: 0.4 AU.

Radius: 0.4 Radius-of-Earth.

There is no atmosphere on Mercury.

Daytime temperature on the equator is 700K (800F)

Special feature on the surface: long (100s of km) Scarps











