

Space - is cold, dark, and very empty. There are stars, planets, moons, asteroids, comets, meteoroids and dust.

Astronomy - is the oldest science.

- is the study that deals with all materials such as sun, moon, stars, planets, comets, gas, galaxies, dust that are beyond the Earth's atmosphere

Astronomer: is a person that studies things in the universe beyond earth.

Early cultures estimated the time of day by the position of the sun in the sky.

A Sundial, which is the oldest known instrument for telling time.

solar system consists of the sun and everything that travels around it.

Luminous - means give off its own light. Stars are luminous.

Planets and moons do not emit their own light. They are nonluminous. We can see them because light from the sun reflects off them.

### Planet Order

A way to remember the order

Mercury Smallest in size (4880 km in diameter)

Venus - hottest

Earth - has life

Mars Red planet & 2<sup>nd</sup> smallest in size (6800 km in diameter)

Jupiter Largest in size (142 000 km in diameter)

Saturn has rings & 2<sup>nd</sup> Largest in size (120 000 km in diameter)

Uranus Coldest

Neptune Known as an Ice Giant

My

Very

Excited

Mother

Just

Served

Us

Nachos

Earth has 1 Moon names Luna

The sun is the largest object in our solar system (1 392 000 km in diameter)

The moon is the closest object to the earth. It is 348 500km away from Earth.

Earth is actually 150 000 000 km away from the sun.

Planets are made of either rock or gases.

Inner planets (Mercury, Venus, Earth, Mars) made of rock

Outer Planets ( Jupiter, Saturn, Uranus, Neptune) made of gas

- ALL planets except Mercury have atmosphere

**Atmosphere** is the thin layer of gases around a planet. The gases are not the same for each planet. For Protection

Moon has no atmosphere. (Why the moon is dark)

**Sun** - is the center of the solar system

- Earth's main source of heat and energy

- All other things reflect the sun's light

- Closes star to Earth

**Comets:** One of the most spectacular things to see in the night sky. The center is a chunk of ice, gas and dust. Usually a few kilometers in diameter. Comets are small compared to stars and planets. They travel far beyond the planets, at the edge of the solar system (Very long orbit around the sun).

### **Formation of a Comet**

When a comet comes close to the sun, the sun's heat causes the gas to start to evaporate from its surface, As the huge cloud of dust and gas starts to grow around it, and a tail of dust starts to spread away from it, Sunlight reflects off the dust and gas particles, making the comet shine.



solar winds



melting of gas, dust blown away from sun and comet by solar winds forming a tail

Halley's Comet was last seen in 1986 and take 75 years to revolve around the sun. When will it be seen again? (1986 + 75 = 2061)

Orbit - is a path an object follows

**Meteoroids are** irregular shaped pieces of rock zipping around space. Broken off pieces of a comet.  
(Smaller orbit than a comet)\_Orbit the sun but takes a shorter time to do so when compared to a Comet

\* Meteoroids that glow are called Meteors

A bright streak of light across the sky is a meteor.

If the meteor hits the earth before vaporizing it is called a meteorite.

### **Satellites**

Are bodies orbiting around a planet

The Moon is earth's natural satellites.

There are man-made or artificial satellites such as the International Space Station

### **Asteroids**

\*Similar to meteoroid but MUCH bigger

\*Thousands of asteroids in solar system

\*Known as airless worlds that orbit the sun but too small to be called planets

\*Asteroid belt is found between mars and Jupiter

### **Earth**

The Earth revolves around the sun counterclockwise, which means it travels in a loop around the sun know as an **orbit**.

-As Earth revolves around the sun it is also spinning on a **tilted axis**

- An **axis** is an imaginary line from the north pole to the south pole

Rotating on axis makes Earth's night and day.

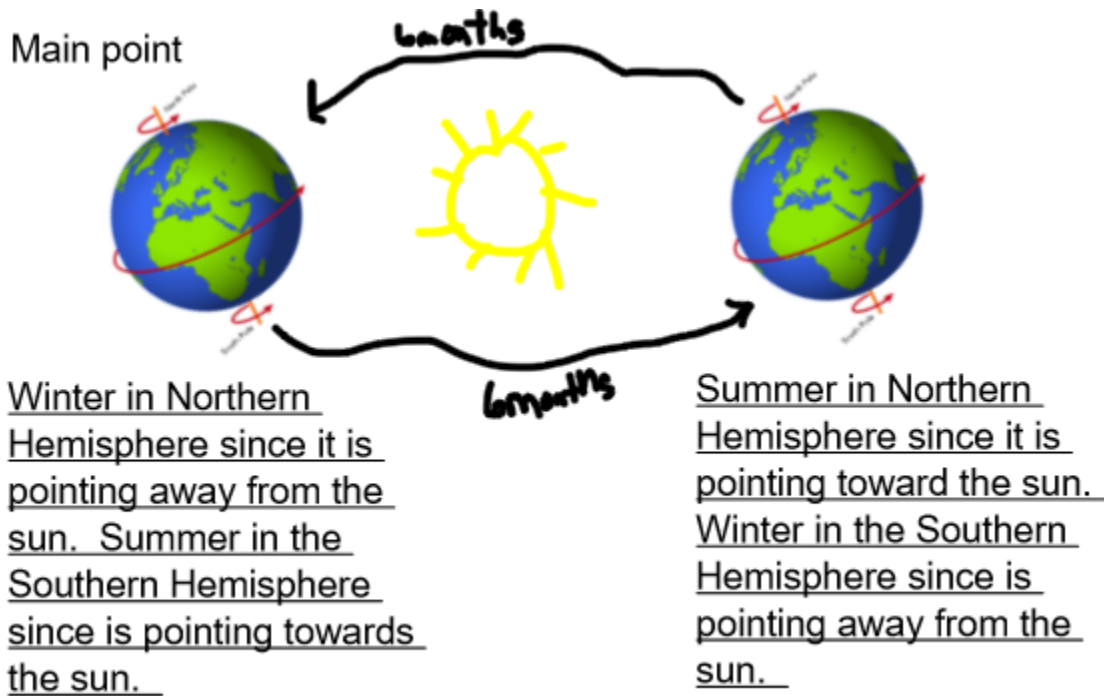
As the earth spins on its axis only half of the earth is facing the sun at a particular time. This is when we have daylight. The back half is dark which is night.

- It takes Earth 24 hours (1 day) to make a complete rotation

### Reason for the seasons

The Earth's Revolution around the sun AND its tilt causes the season.

It takes Earth 365 days (1 year) to make a complete orbit around the sun. This is known as the orbital period.



### Stars

Stars are large balls of gas that are on fire.

The closest Star to Earth or any other planet is the sun.

Stars are very far away and that is why they appear so small.

Constellations are a group of stars that form pattern/ pictures in the sky.

Terms

1) Gravity - an invisible force that pulls thing to the center of the earth

2) Mass - The amount of matter

3) Weight - measure how much gravity pulls down on an object

## Moon

Gravity of the moon is the force that pulls toward the center of the moon. The gravity on the moon is less than the gravity on Earth. This is why astronauts float on the moon.

The moon is closer to the earth than any other object in the solar system. People have visited the moon.

The moon's surface is covered with **craters**. Craters are large, shallow holes in the ground on the moon. They are formed by the impact of meteorites smashing into its surface. MOON has uneven rough surface full of peaks and valley that can be seen with a telescope.

## Craters

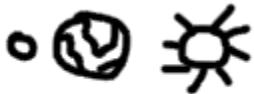
There are two ways to form craters:

- 1) Something huge hits the surface of the planet and makes an impact (dent)
- 2) Volcanic Craters - when the top of a volcano collapses

On July 20, 1969, Neil Armstrong became the first human to step on the moon. He and Aldrin walked around for three hours. They did experiments. They picked up bits of moon dirt and rocks.

First words as he steps onto the moon, "One small step for man, one giant leap for mankind."

Lunar Eclipse - the Earth blocks the sun's light from reaching the Moon.



total lunar eclipse

Solar Eclipse - the Moon blocks the sun's light from reaching the Earth.



Solar eclipse

How does the moon move?

The Moon is the largest and brightest object in the night sky. The Moon does not give off its own light, it reflects the sun's light.

To us the Moon appears to change shape over the course of several nights. We call these different shapes the phases of the moon.

The Moon, like the Earth, has two kinds of motion.

- 1) revolves around the Earth in an orbit
- 2) rotates on its axis.

The **phase of the moon** is how much of the moon appears to us on Earth to be lit up by the sun. Half of the moon is always lit up by the sun, but we only see a portion that's lit up.

Waxing - is when the new moon begins and we see more and more of the moon.

Wanning - starts after full moon and we see less and less of the moon.

**The phases of the moon starting with the New Moon are:**

- > New Moon
- > Waxing Crescent
- > First Quarter
- > Waxing Gibbous
- > Full
- > Waning Gibbous
- > Third Quarter
- > Waning Crescent
- > Dark Moon

→ don't see moon



[Moon Phases: Waxing, Waning and Lunar Cycle - Video & Lesson Transcript](#)