



SPACE NOTES 2

Covers Objectives 3 , 4,
and 8

THE SUN

Average Size Star

Sun 101



SUN'S MASS

- almost 100 times the mass of all the planets combined.
- Most of the mass is hydrogen gas

THERMONUCLEAR REACTION

- Thermonuclear reactions in the sun's core cause hydrogen gas to fuse to create helium and energy
- The energy created keeps Earth warm enough to support life

SUN AS A SOURCE OF UV RADIATION

- UV radiation thins the ozone layer that surrounds Earth
- What impact will this have on people, animals, and crops?
- What can we do to reduce the thinning of the ozone layer and protect ourselves?
- [Ozone Layer Depletion HD - YouTube](#)

SUN IS A SYSTEM OF BUBBLING GASES

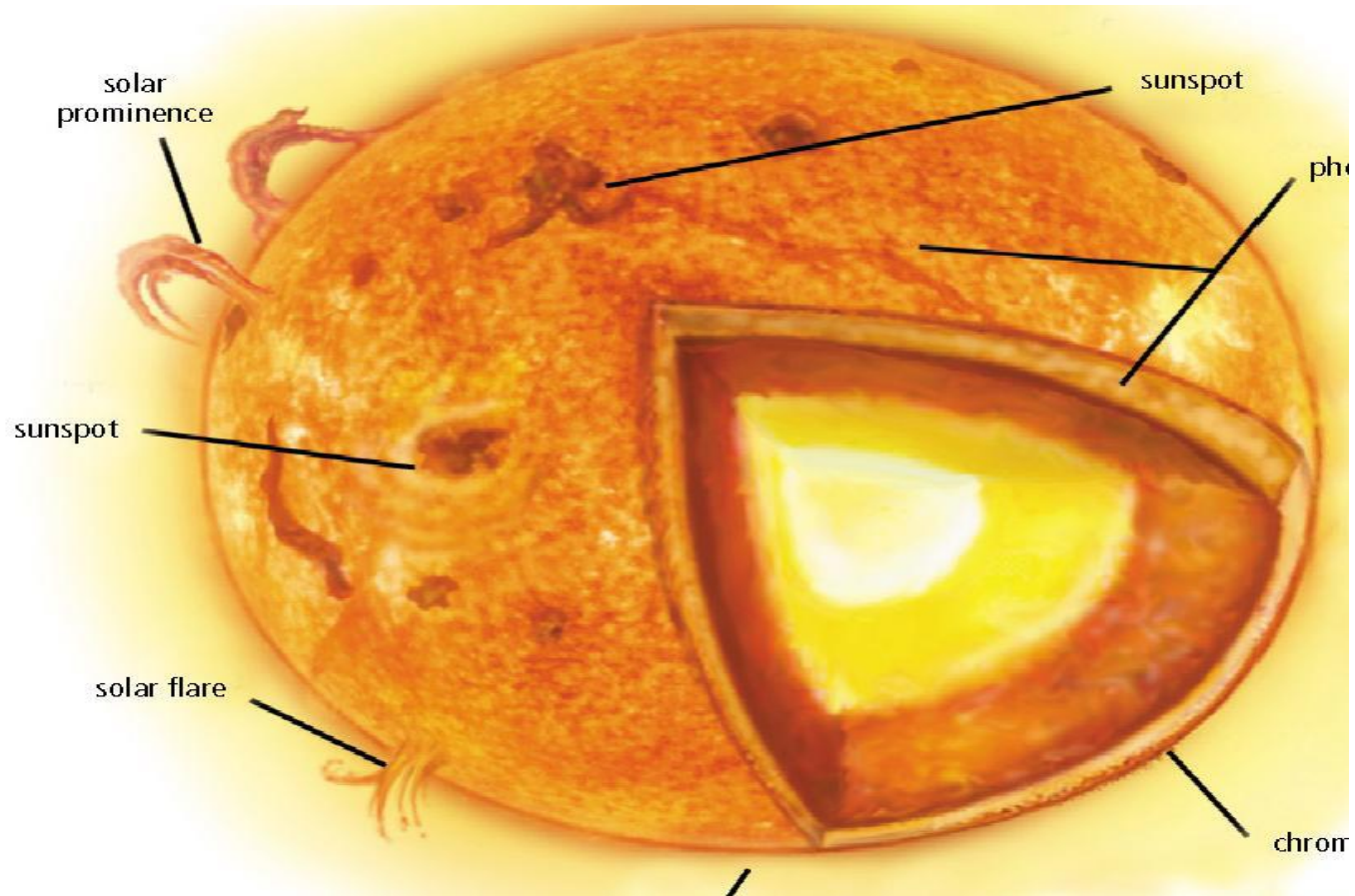
The sun occasionally sends out spectacular explosions and violent solar flares



SUN PICTURE (DRAW DIAGRAM & IDENTIFY PARTS)

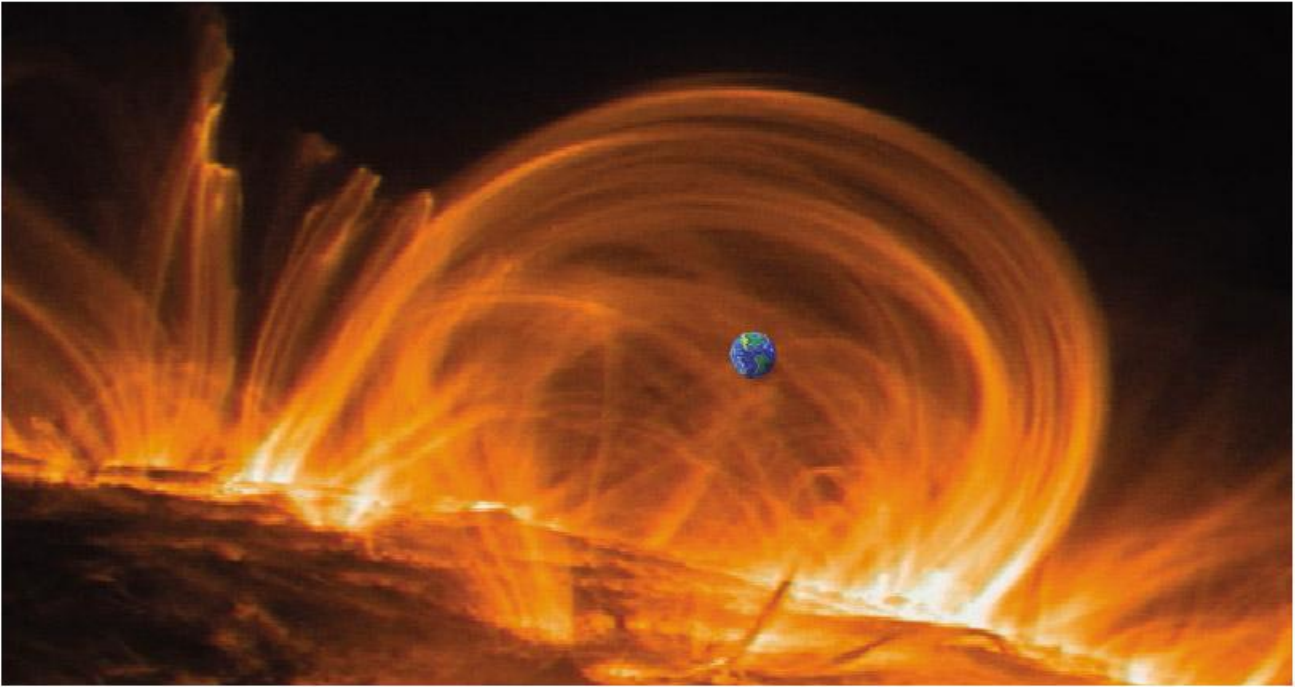
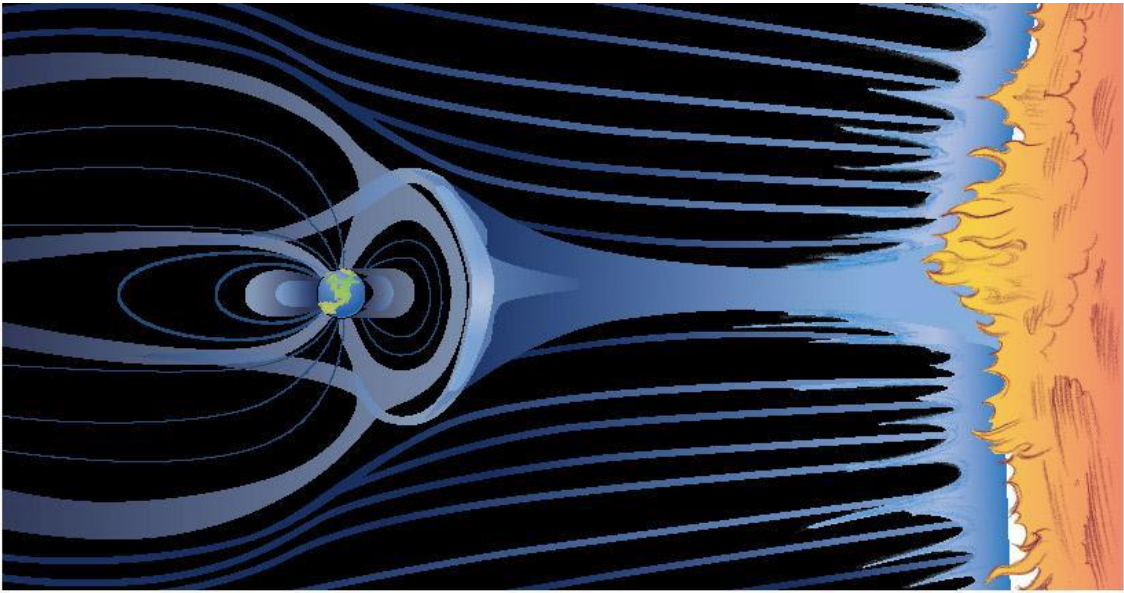
- **Sun spots** – dark patches that indicate parts of the surface that are slightly cooler
- **Solar prominences** – large loops of super hot gas that extend from the sun's surface.
- **Solar flares** – violent eruptions of gas

SUN PARTS



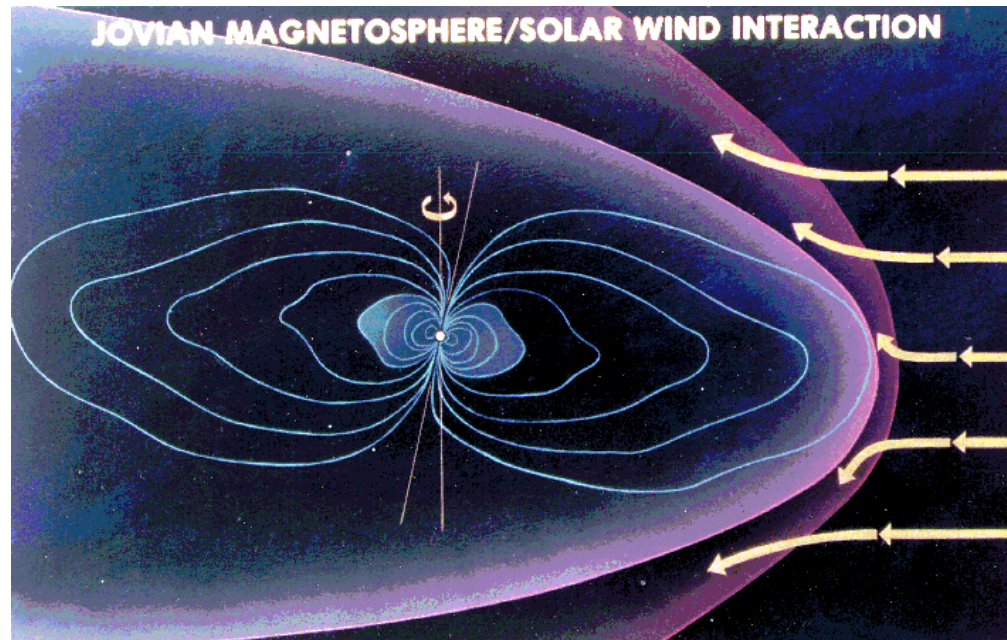
SOLAR WIND

- Hot energetic gases in the sun's corona get spewed out in every direction. As they rush past Earth they create an effect called the solar wind.
- Exposure to solar wind could be fatal for any organism living on Earth.



WHAT PROTECTS EARTH FROM THIS SOLAR WIND?

- Earth's Magnetic Field forms a shield that deflects radiation in the solar wind



WHAT CAN SOLAR WINDS GENERATE?

- Northern lights
- Geomagnetic storms
- Disturbances in earths magnetic field which can disable satellites and knock out powerlines.

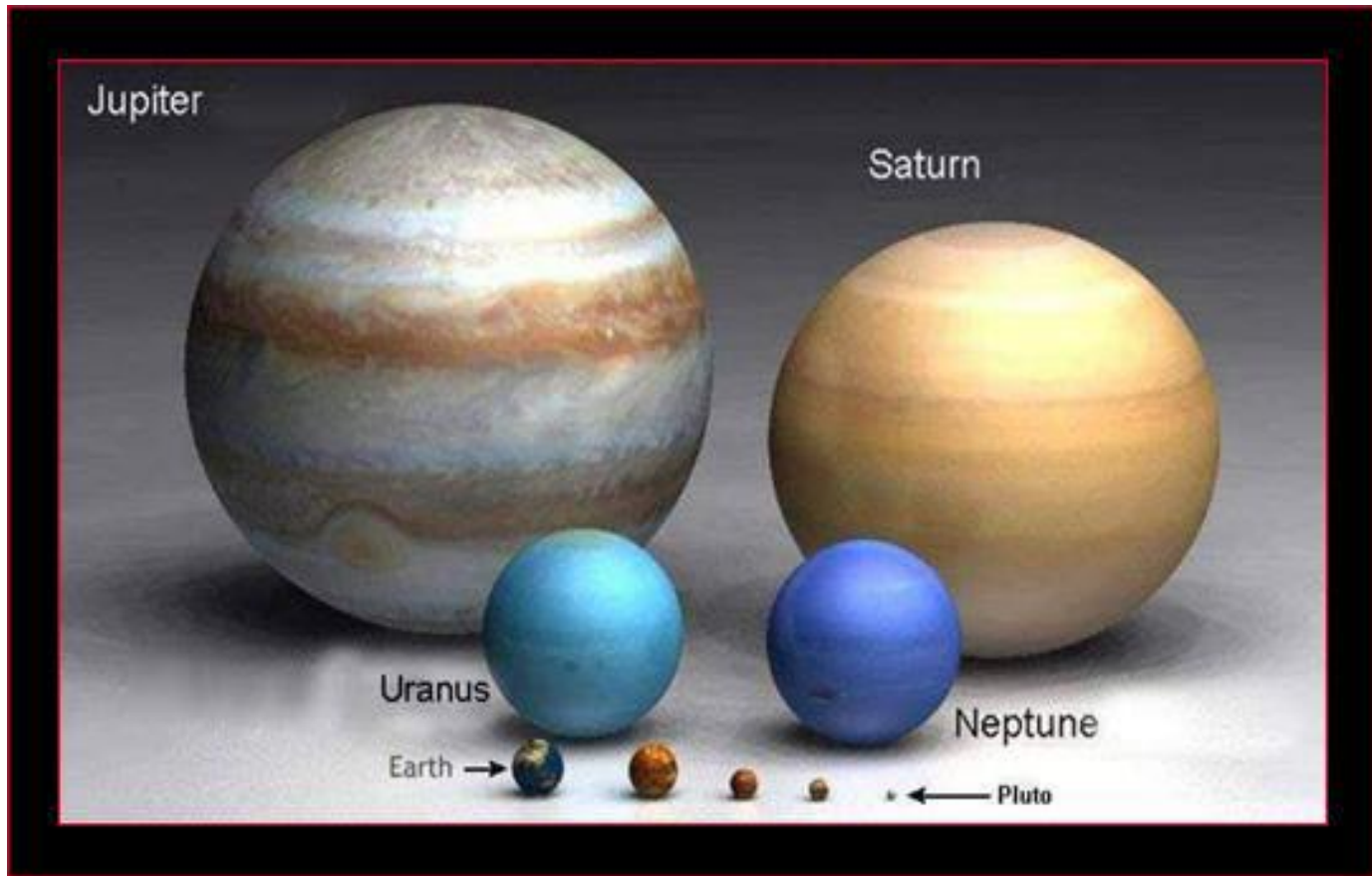
FORMATION OF NORTHERN LIGHTS (AURORA BOREALIS)

- Some of the high energy particles in the solar wind enter earth's atmosphere at the North and South poles, where they collide with gases creating the northern lights.
- The colors that can be seen in these lights depend on which gases collide with the particles.

AURORA BOREALIS



PLANETS



TO BE A PLANET YOU MUST.....

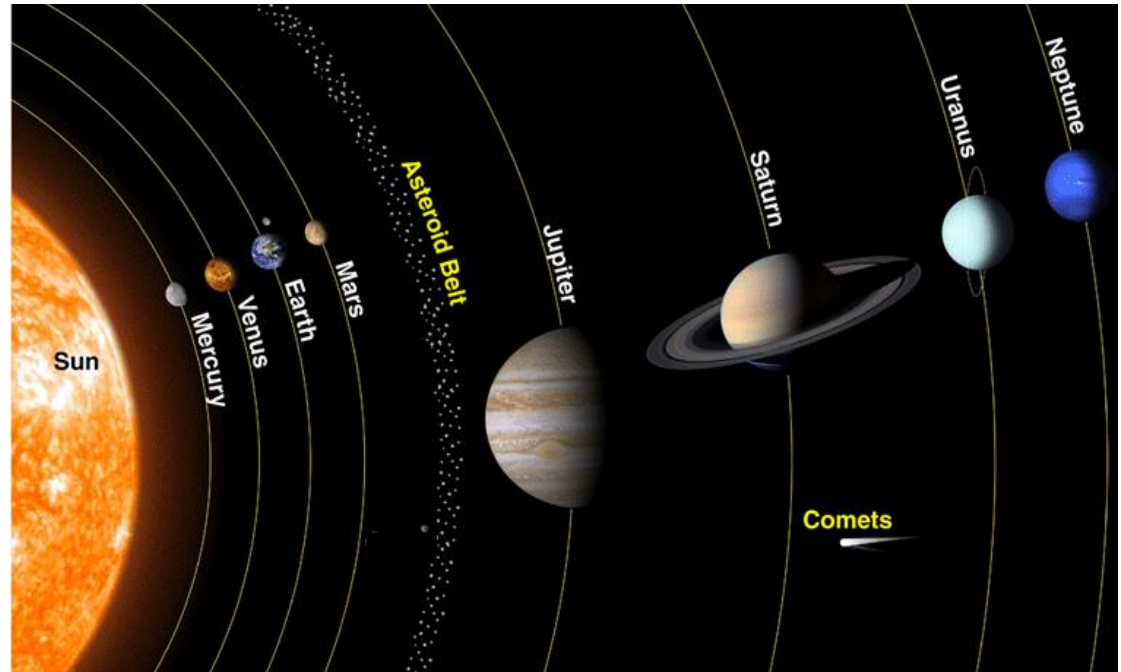
- Orbit 1 or more stars (**elliptical orbit**)
- Be large enough so its gravity holds it in place
- Be the only body in its orbital path as it rotates and revolves around the sun.



PLANETS VIDEO CLIP

<https://www.youtube.com/watch?v=cs9ZUdylmWQ>

- Make note of the **order** / **color** of the planets
- The **Asteroid Belt** is located between **Mars** and **Jupiter**
- What happens to the temperature as you move further away from the sun



INNER ROCKY PLANETS

Also called terrestrial planets

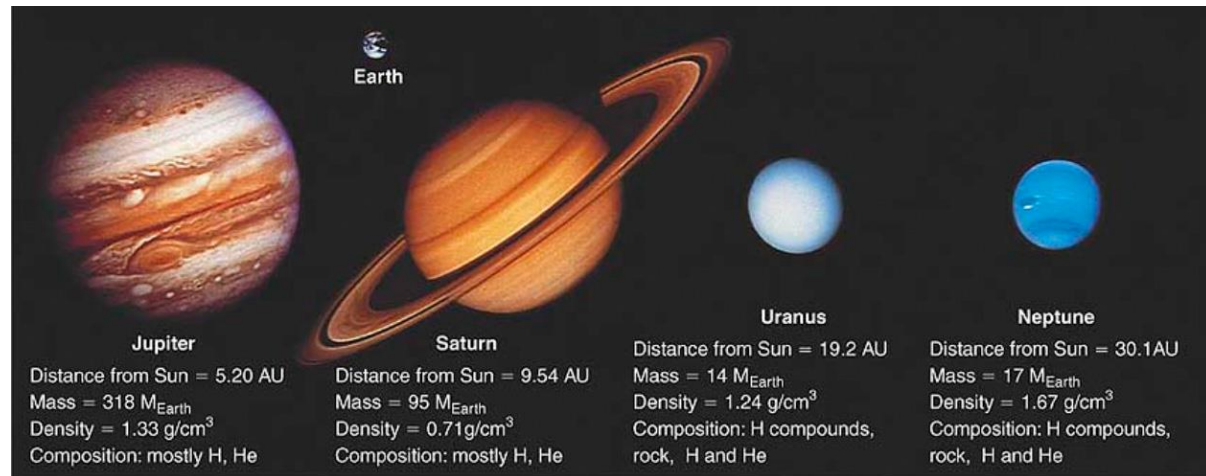
- Mercury
- Venus
- Earth
- Mars



OUTER GASEOUS PLANETS

Also called Jovian Planets

- Jupiter
- Saturn
- Uranus
- Neptune



- Pluto is no longer considered a planet



TERRESTRIAL VS JOVIAN PLANETS

	Terrestrial	Jovian
Size	SMALL	LARGE
Motion	SLOW SPINNING, SMALLER ORBITS	FASTER SPINNING, LARGER ORBITS
Composition	SOLID AND ROCKY	GASEOUS
Distance from the sun	CLOSER	FURTHER AWAY
Temperature	WARMER	COLDER
Density	GREATER	LESSER

ASTRONOMICAL UNITS (AU)

Used to measure distances in space

1 AU = 150 million km

(the distance from the Earth to the Sun)

CHARACTERISTICS OF PLANETS

[Bill Nye Video on Planets](#)

[Sam The Dog in Space](#)

[Red Bull Space Jump](#) (Warning...if you get motion sickness...might want to look away...)

Assignments

- Gravity & Weight on Other Planets
- Planet Bar Graph
- Planet Motion Worksheet
- Solar System Characteristics
- Planet Riddles

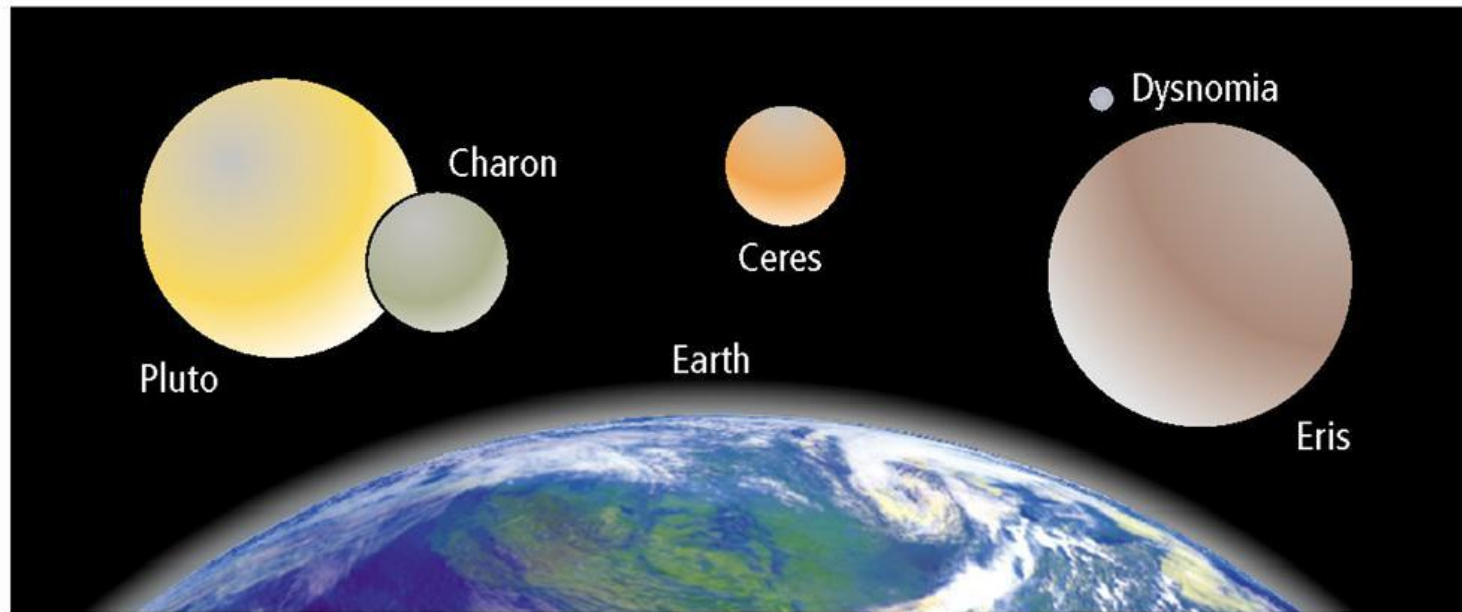
PLUTO

Now considered Dwarf Planet

—a celestial body orbiting the Sun that is generally smaller than a planet but massive enough for its own gravity to give it a round shape. However they are not strong enough to clear their orbit of debris

There are many other “dwarf planets” some are bigger and some like Pluto have moons

A COMPARISON OF 3 DWARF PLANETS AND EARTH, NOTICE SOME HAVE MOONS AND SOME DON'T





COMETS

[Bill Nye Video on Comets
& Meteors](#)

“DIRTY SNOWBALL”

Composed of ice, rock, and gas

Long dust tail

Figure 11.15 Page 405



TAIL

Comets can have more than one tail

Sunlight can cause a comet to begin to melt, releasing its trail of gas and dust creating a tail that streams away from the sun

Tail can stretch for millions of kilometers

HOW COMETS TRAVEL

Long, elliptical orbits around the sun.
Their orbits are unique.

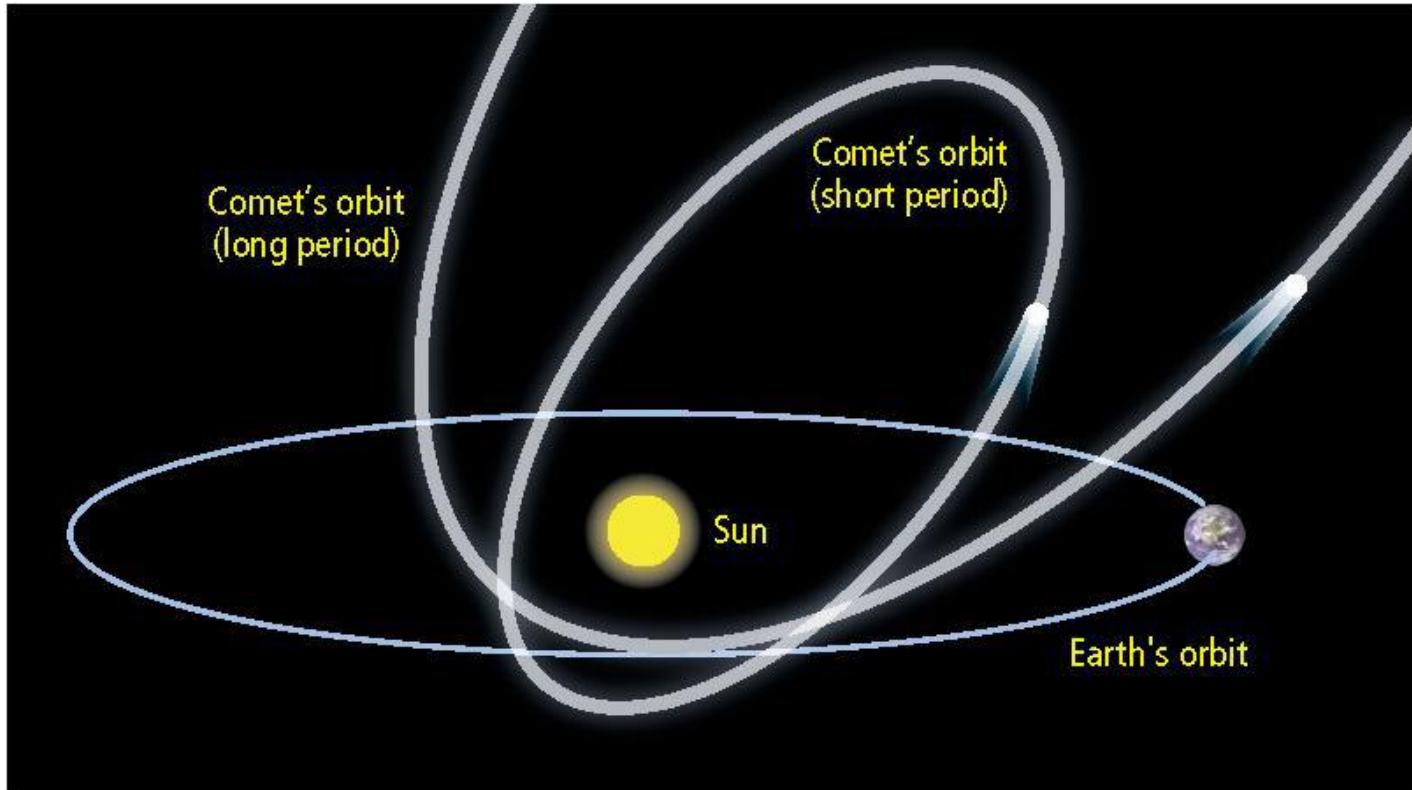
Their orbital path can be modified through the gravitational attraction of the planets, primarily Jupiter, sometimes putting them on a collision course with a planet or the sun.

Figure 11.18 Page 406

COMET CATEGORIES

Short period comets (those which take less than 200 years to complete an orbit around the Sun) originate from the Kuiper Belt (past the orbit of neptune about 30 to 100 AU from the sun).

Long period comets (those which take more than 200 years to complete an orbit around the Sun) originate from the Oort Cloud (beyond orbit of pluto).



Comet's orbit
(long period)

Comet's orbit
(short period)

Sun

Earth's orbit

FAMOUS COMETS

Halley's comet (first comet whose return was predicted, every 76 yrs)

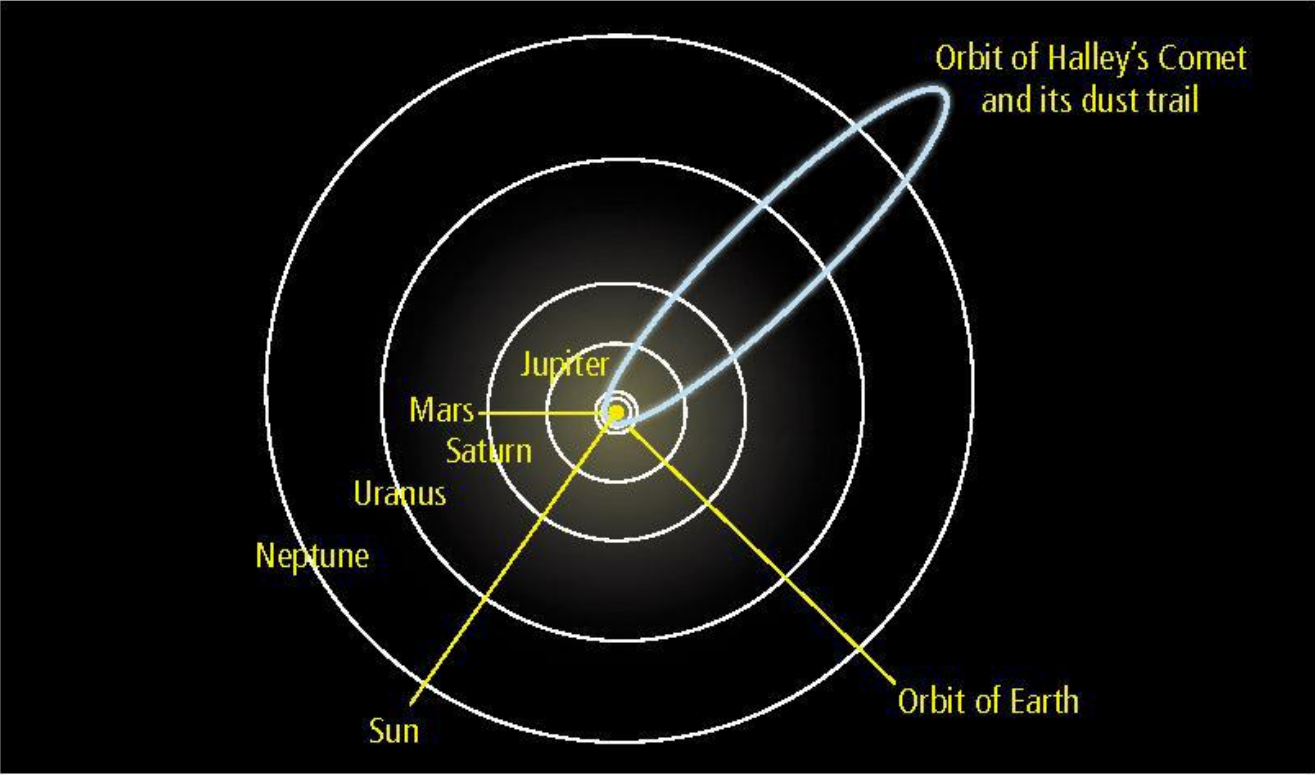
Hale-Bopp

Shoemaker-Levy

[HowStuffWorks "100 Greatest Discoveries: Halley's Comet"](#)



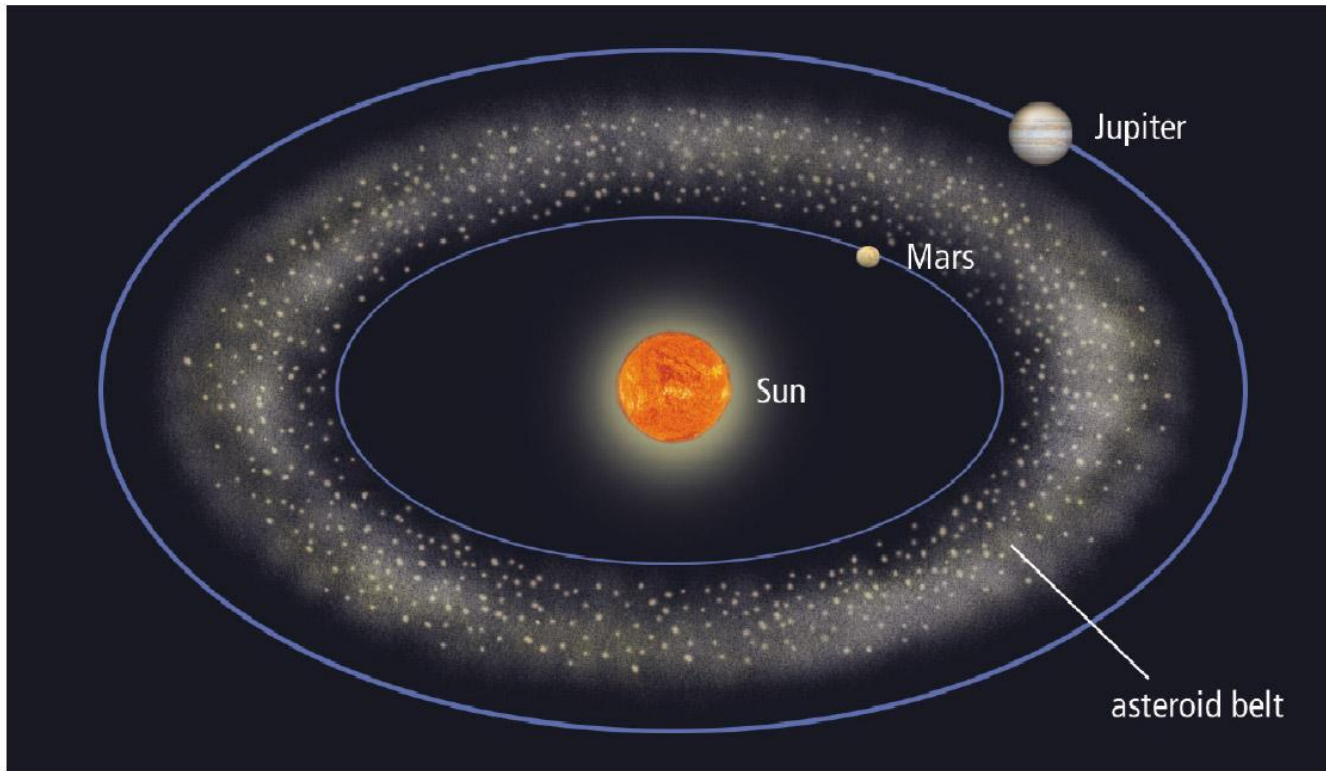
Is Halley's comet a short or long period comet? Page 405



ASTERIODS

Small bodies that are believed to be leftover remains of the formation of the solar system

Most asteroids have orbits similar to planets, other asteroids have irregular orbits due to gravitational attraction of planets and collisions



LOCATION OF ASTEROIDS

Orbit the sun in a band between
Mars and Jupiter (Asteroid Belt)

Figure 11.13 Page 403

METEOROID

Pieces of rock floating through
space

METEORS

Meteoroids that burn up as they enter Earth's atmosphere at high speed

Sometimes called shooting stars



METEORITE

Surviving portions of a meteor that reaches earth

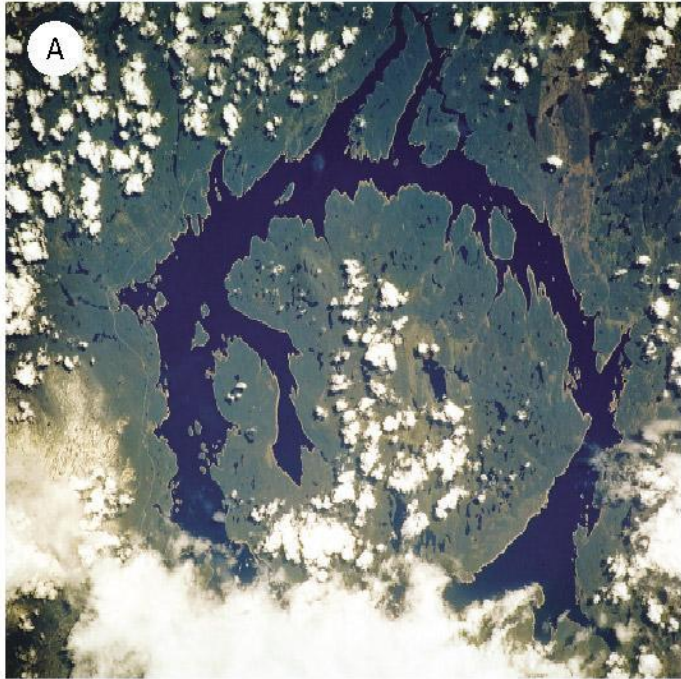
IMPACT SITES

Place where a meteorite collides with a planet and creates a circular depression on the planet.

Circular depression created is often called an impact crater.

Figure 1 1.20 Page 407

IMPACT CRATOR





[Meteor crash in Russia, 1 500 people injured!! Ural, Chelyabinsk! New Video Part 4 – YouTube](#)

(start video clip at 4.57)



CRATER ACTIVITY PAGE 409

VIDEO

THE MARTIAN

