NOTES FOR ASTROFE

Name:_____

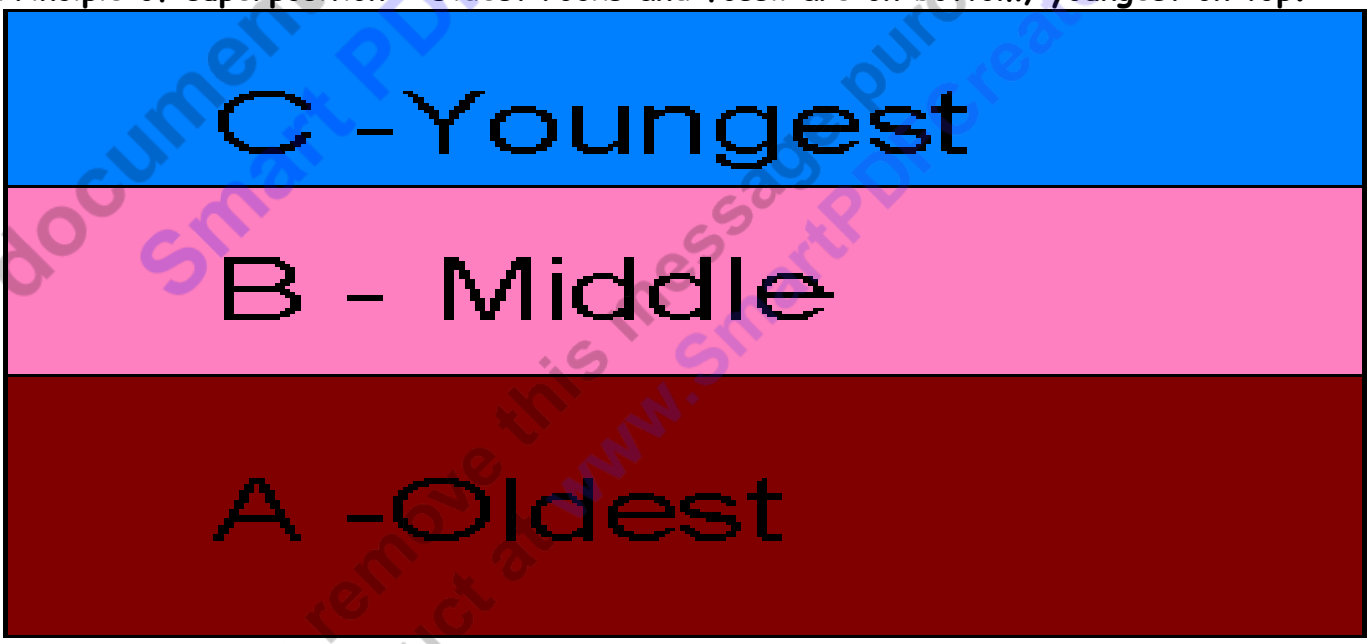
(DO NOT LOSE!)

Earth System History and Astronomy

Earth History Components

- Earth system history has physical, chemical, and biological components
- Uniformitarianism: Laws of nature have not changed over time.
- The system is fragile. Changes in living conditions for animals have been numerous throughout earth's history.
- 99.5% of all things that have ever lived have become extinct.

- **Principle of superposition – Oldest rocks and fossil are on bottom, youngest on top.**



Precambrian

Hadean, Archean, and Proterozoic Eon's

Earth's Molten layers form (Denser to middle)
Formation of Earth's Crust (cooling).

- Meteorites bombard the planet and carry with it water molecules and amino acids (building blocks of protein).

Moon created from comet impact
Atmosphere originates (No oxygen yet)
Earliest life begins (primitive protocells)

- Microbes helped produce an oxygen atmosphere through photosynthesis.

First Multi-cellular life (many cells)
Explosion of new animals (sea)

Paleozoic Era

Vendian, Cambrian, Ordovician, Silurian, Devonian, Carboniferous, and Permian Periods.

Marine invertebrates dominate
Jawed Fish Evolve
Plants invade land (Oxygen to atmosphere)
Insects emerge
First Amphibian
First Reptiles
First winged insect

Mesozoic Era

Triassic, Jurassic, Cretaceous Periods

Dinosaurs dominate
First Birds
First Mammals
First Flowers
K-T Mass Extinction Event, 65mya

Cenozoic Era

Tertiary, and Quaternary Periods

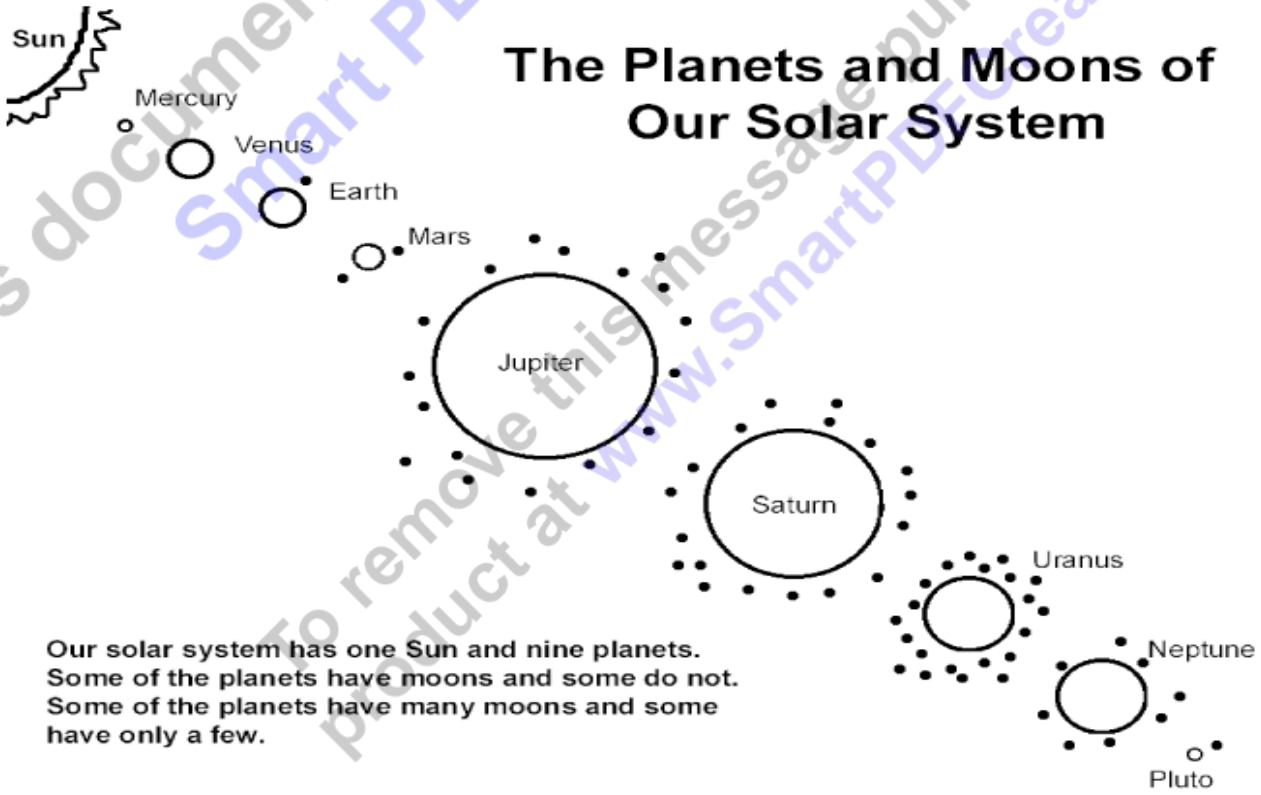
Mammals change
Earliest Monkeys
Climate becomes drier
Panama attaches South America to North America
First human hominids

Modern Man (Whoa)
Civilization
Age of Exploration, Industrial and Computer Age

Astronomy and our Solar System

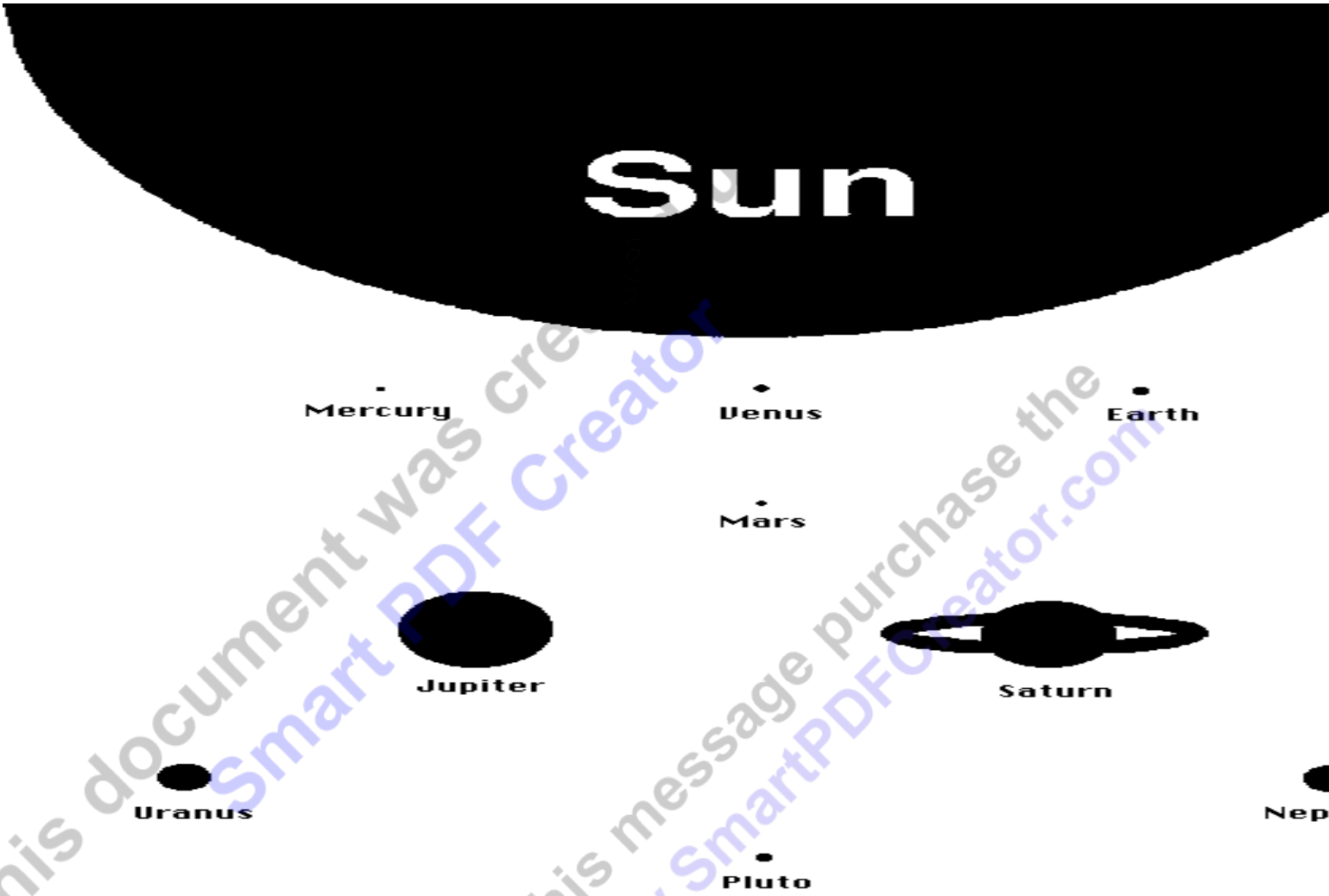
To help with the plaents

- My = Mercury
- Very = Venus
- Eager = Earth
- Mother = Mars
- Just = Jupiter
- Served = Saturn
- Us = Uranus
- Nachos = Neptune



Orbit: The path (usually elliptical) of one celestial body in its revolution around another.

The Sun is by far the largest object in the solar system. It contains more than 99.8% of the total mass of the Solar System.

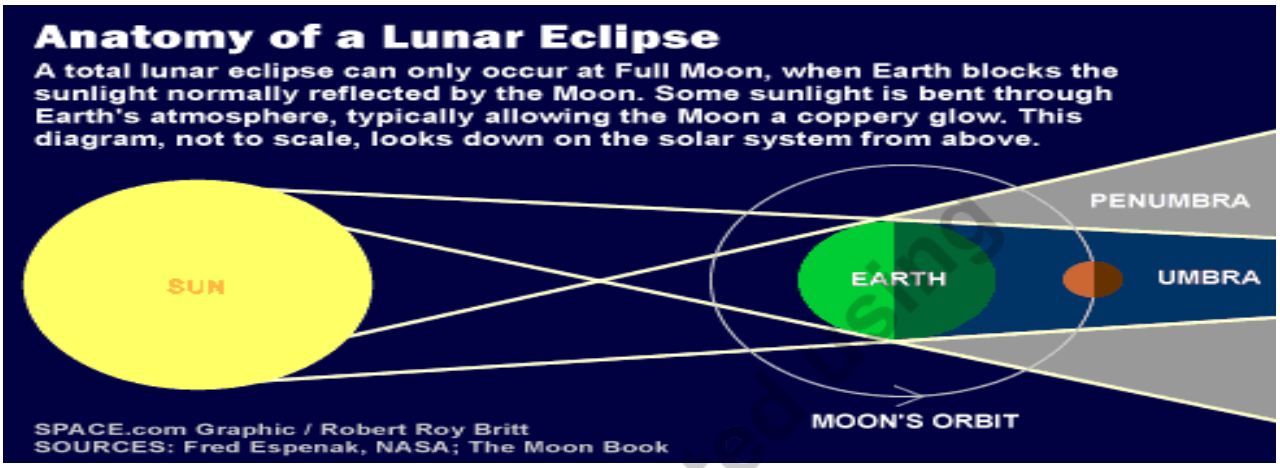


New Area of Focus: The Sun

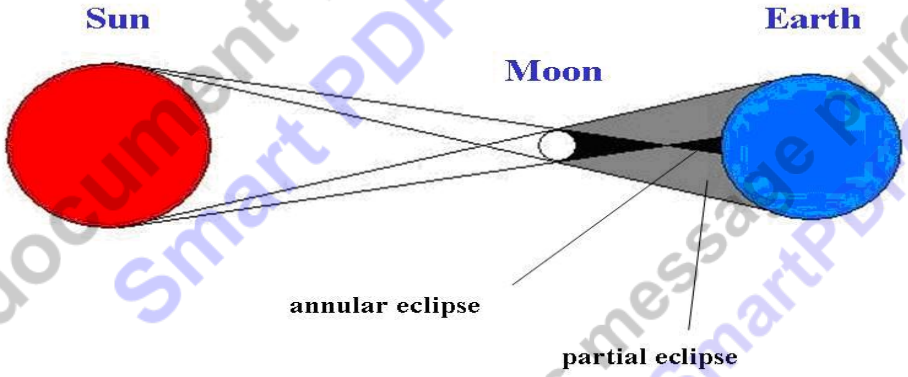
All energy for our solar system comes from the sun. Check out Corona Ejections

The Sun is, at present, about 70% hydrogen and 28% helium by mass everything else ("metals") amounts to less than 2%.

Lunar Eclipse - The earth interrupts light shining on the moon



Solar Eclipse - When the Moon passes between the Sun and the Earth so that the Sun is wholly or partially obscured



Partial Eclipse – Only part of a body is covered.

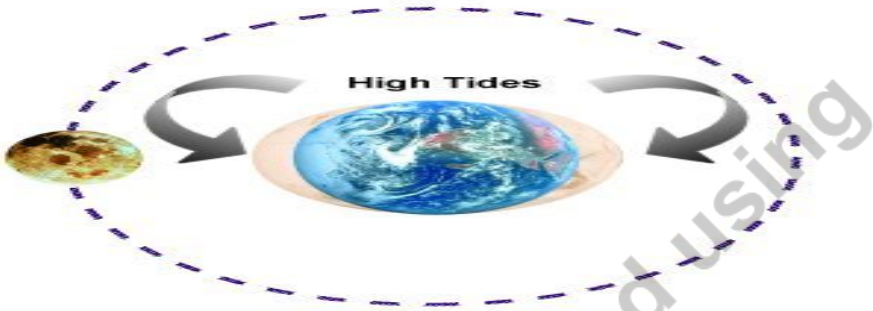
PLANET INFORMATION FROM RESEACH

Craters can be found on earth, but most craters are eroded away by wind and water. Most meteorites also burn up in our atmosphere.

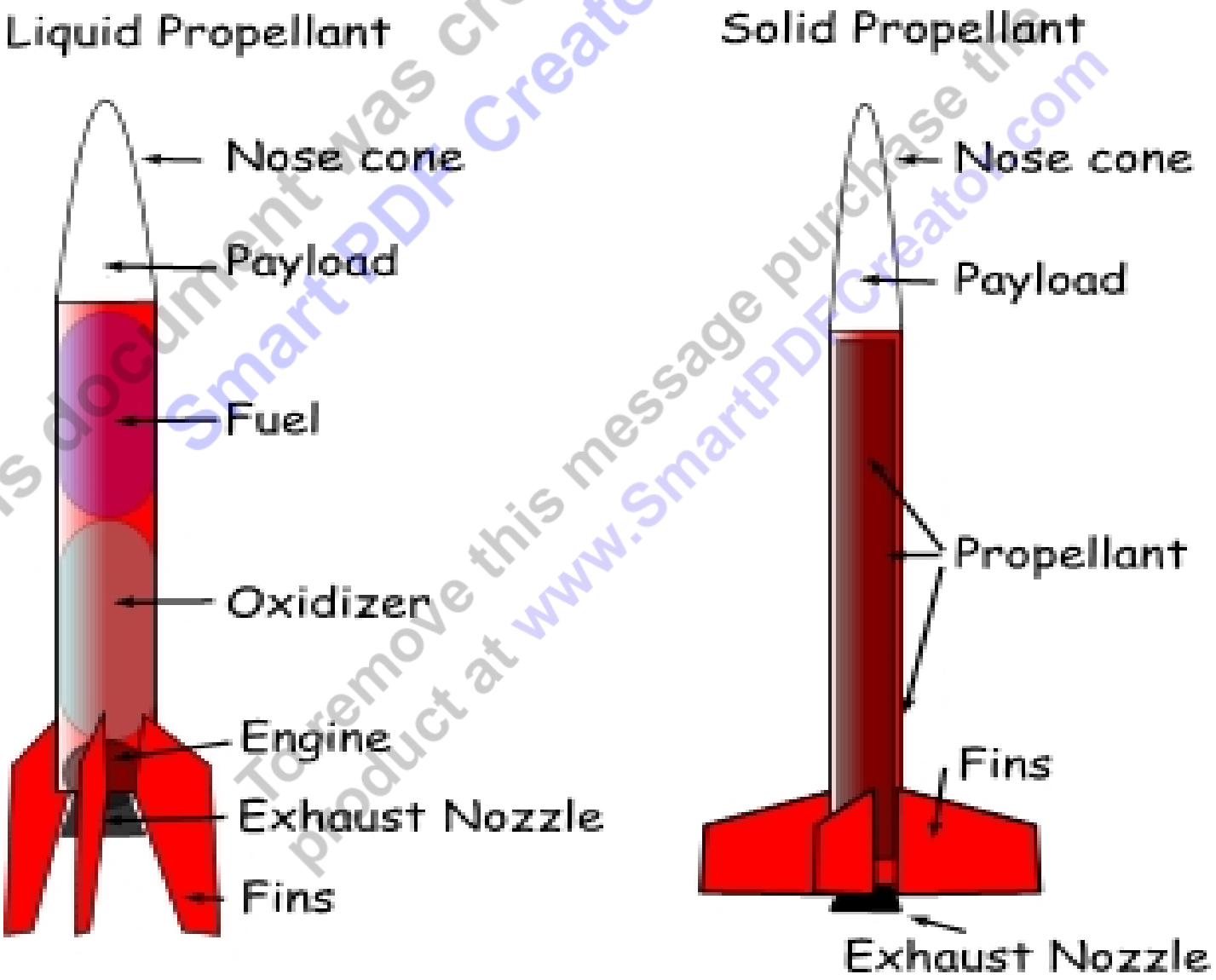
Phases of the Moon

Tides are the rising of Earth's ocean surface caused by the gravitational forces of the Moon and the Sun acting on the oceans.

-Two high tides, and two low tides per day. Equals one tidal cycle per day. - - Separated by about 12:34 hours



Gravity - The force of attraction between all masses in the universe.

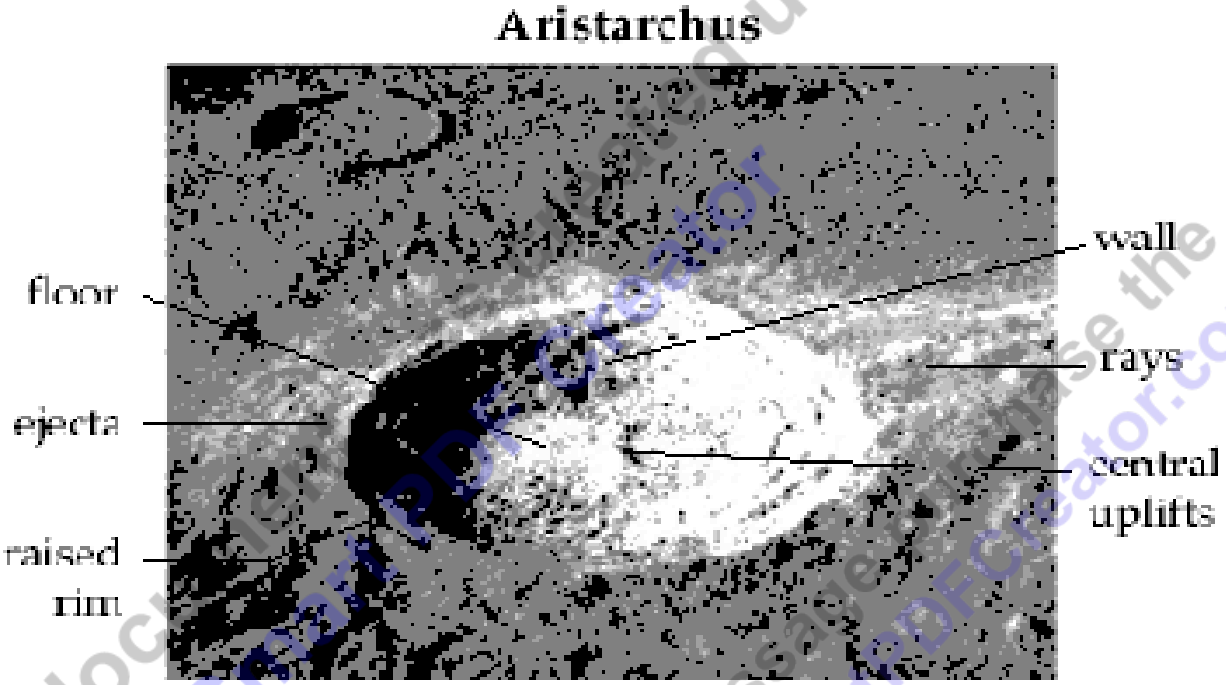


Asteroids are rocky and metallic objects that orbit the Sun but are too small to be considered planets.

Meteorite – Space matter that has fallen to the earth's surface from outer space.

Meteoroid – Small (dust size to coin) piece of matter that hits the earth's atmosphere (burns up)

NEO – Near Earth Object (comets and asteroids that come very close to earth.



PARTS OF A CRATER

New Area of Focus: The outerplanets and Gas Giants

Gas Giant: A large, massive, low-density planet composed primarily of hydrogen, helium, methane, and ammonia in either gaseous or liquid state.

JUPITER

- Twice as massive as all other planets combined.
- Fourth brightest object in sky
- Gas Giant (Gets denser as you go down)
- May have a small rocky core
- Mostly Hydrogen and a bit of Helium
- High Velocity Winds cause bandings
- Red Spot (Giant Storm)
- 63 Moons or Satellites
    - Moons

- Io –
- Rotten orange with acne
- Tidal active (no water, Sulfur)
- Volcanically active
- No impact craters because of
- volcanic dust

SATURN

- Saturn
  - 34 Moons
  - Not very dense (can float in water)
  - Very similar in composition to Jupiter
    - Hydrogen 75% and Helium 25%
    - Missed becoming a star
  - Has rings (A, B, and C)
    - Billions of particles from dust to meters long
    - Mostly water and ice

URANUS

- 3rd Largest Planet
- Takes 84 earth years to orbit sun
- Methane absorbs red and reflects blue
- Winds of 360 mph
- Tipped on side (Early Comet Strike)
- 27 moons

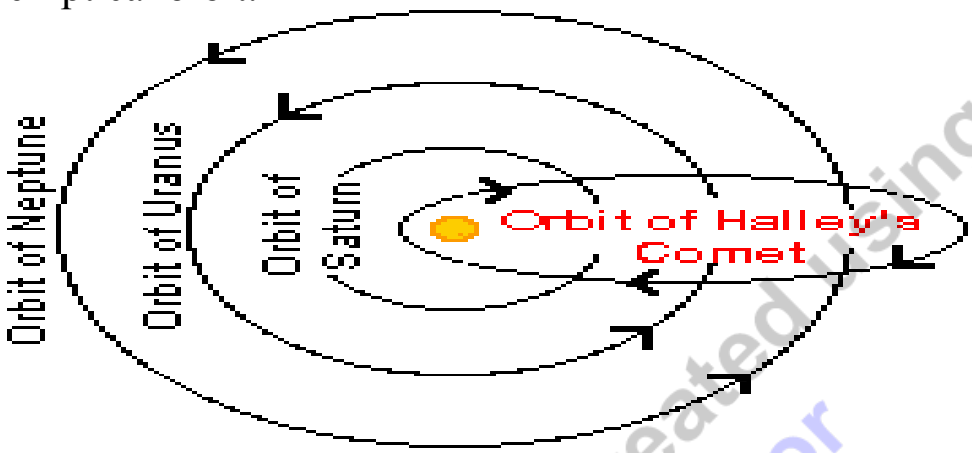
NEPTUNE

- Outermost gas planet
- Orbits sun 165 Earth Years
- Molten Rock, Methane, Water, Ammonia
- Winds of 12,000 mph
- 4 faint rings
- 13 Moons

Kuiper Belt (Pronounced Kyper)

- A disk-shaped region of minor planets outside the orbit of Neptune.
- 70, 000 minor planets, many like Pluto

Comet - A frozen mass (3-5 mile diameter) that travels around the sun in a highly elliptical orbit.



Nebula – Large cloud of gas and dust which can form stars and galaxies

Quasar – Gigantic grouping of powerful stars.

Black Hole - a region of space resulting from the collapse of a star with an extremely high gravitational field.

Neutron Star – Type of star leftover when a large star collapses. (Creates Black hole)

Galaxy – Large group of stars, gas, and dust that constitute the universe. By a large group, we mean hundreds of billions.

The Big Bang Theory - The cosmic explosion that is hypothesized to have marked the origin of the universe.

THE END, SAVE THESE NOTES FOR THE ASTROFE.