

The Earth and the Solar System

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History RECAP

- Copernicus: Planets Orbit around the Sun
- Kepler: Planets orbit in ellipses not circles

INNER VS OUTER PLANETS

INNER

- Relatively Small
- Rocky Surface

REMEMBER...

MERCURY AND VENUS HAVE NO MOONS

NONE OF THESE PLANETS HAVE RINGS

ASTEROID BELT IS WHAT SEPARATES THE
INNER FROM THE OUTER PLANETS

OUTER

- Relatively Large
- Gaseous and Thick Atmosphere
- Lots of Water (Usually in the form of Ice)

REMEMBER....

ALL OF THESE PLANETS HAVE MORE THAN
ONE MOON

ALL OF THESE PLANETS HAVE RINGS

DOES NOT HAVE A MOLTEN ROCK
SURFACE :)

Momentum RECAP - Creation of the Solar System

- Regular momentum: an object in motion stays in motion
- Angular momentum: an object that spins continues to spin
 - depends on the object's size and how rapidly its rotating
 - decrease the size and rotation rate goes up
 - Remember Mr. Fulmer's Chair and Book Example

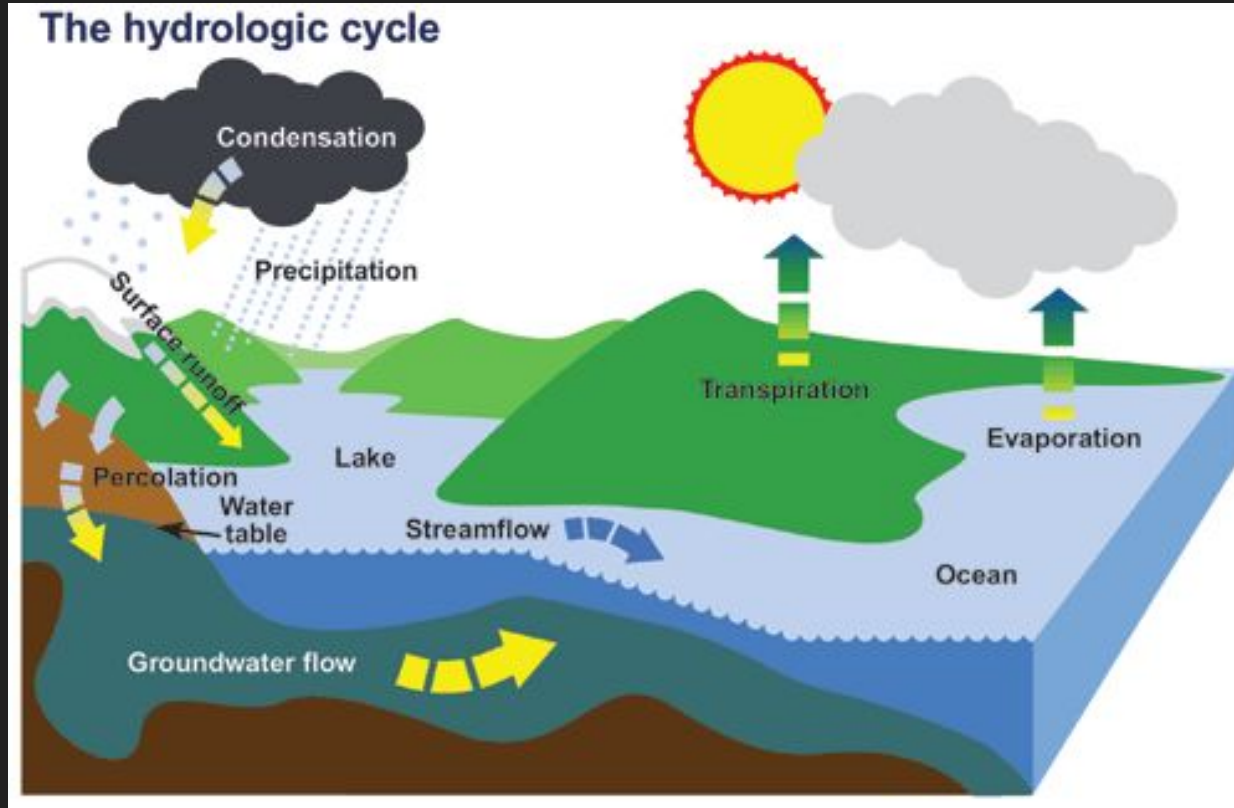
Solar System formation RECAP

- “Floating Cloud Collapsed, all of the material fell in to the center of this “cloud”
- Away from the center of this “cloud”, material clumped together and gravity became stronger
- These clumps became protostars and protoplanets
- Center of protostar became so hot that it started to fuse hydrogen into helium

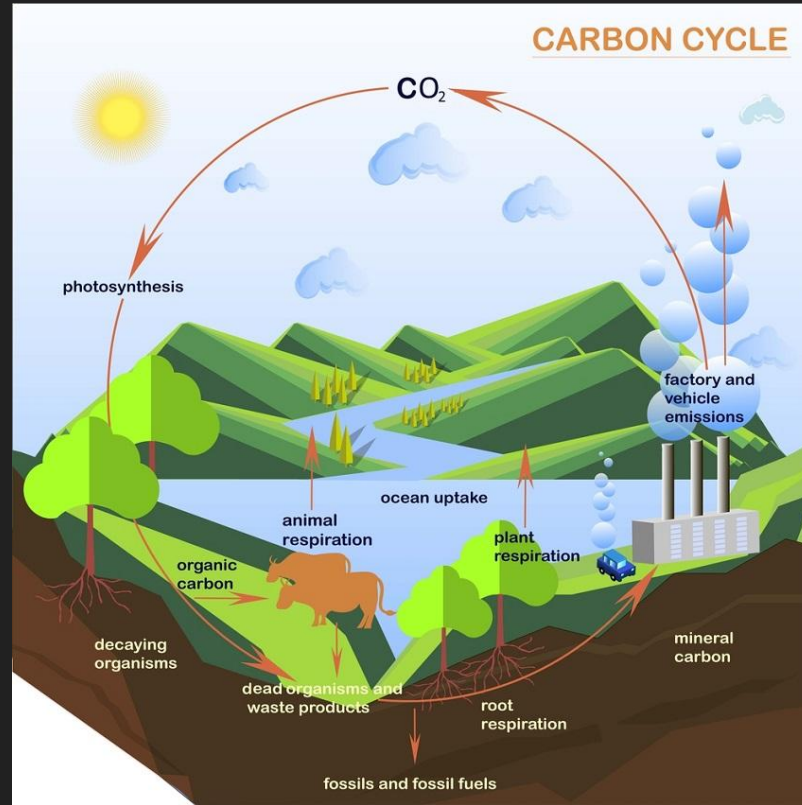
Earth Facts and Layers

- Largest of Terrestrial Planets, One Moon, Has Water, 13,000 km across
- LAYERS
 - Inner Core
 - Solid; Iron & Nickel
 - Outer Core
 - Liquid; Iron & Nickel
 - Mantle
 - Crust
 - Solid Rock
 - Atmosphere
 - Mostly Nitrogen and Oxygen

Hydrologic Cycle

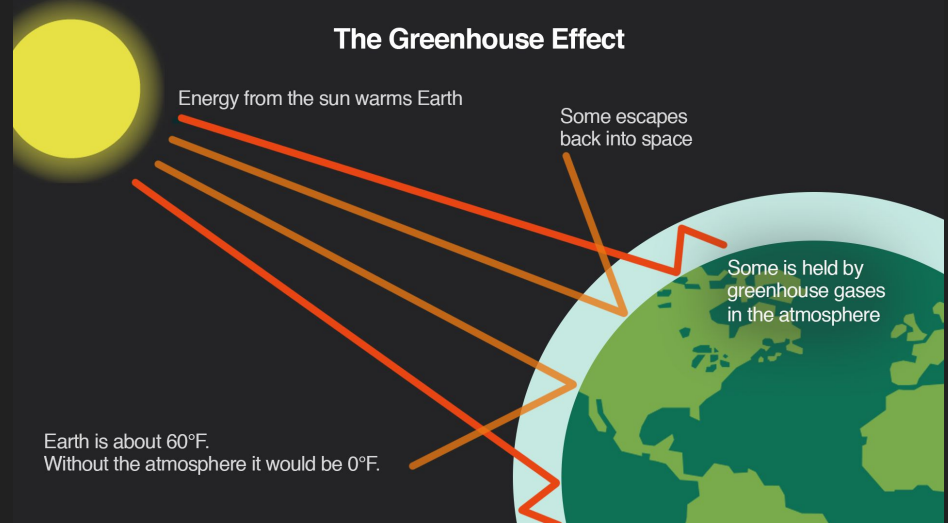


Carbon Cycle



Greenhouse Gas Effect:

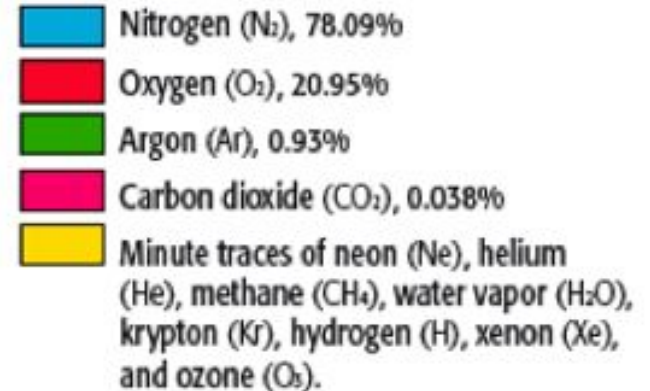
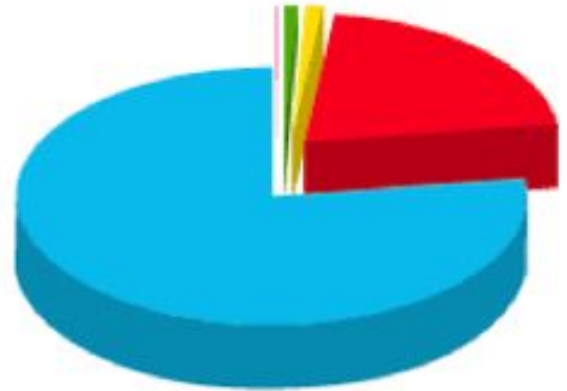
- The greenhouse effect is the process by which radiation from a planet's atmosphere warms the planet's surface to a temperature above what it would be without its atmosphere. If a planet's atmosphere contains radiatively active gases they will radiate energy in all directions.



Earth's Atmosphere

- 78 percent Nitrogen
- 21 Percent Oxygen
- 1 Percent Other Gases

Atmospheric composition

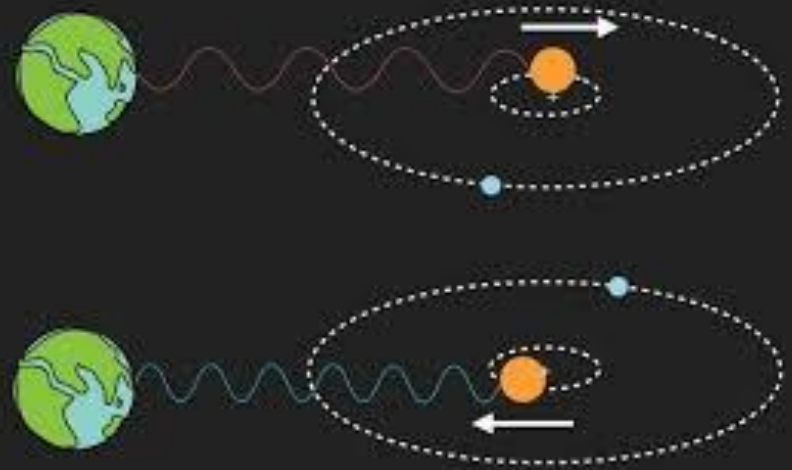


Exoplanets RECAP

- Exoplanet- A planet outside of our solar system
- There are 5 different ways to find new planets
- Radial Velocity, Transit, Direct Imaging, Gravitational Microlensing, Astrometry
- More than 4,000 exoplanets have been discovered using these 5 methods

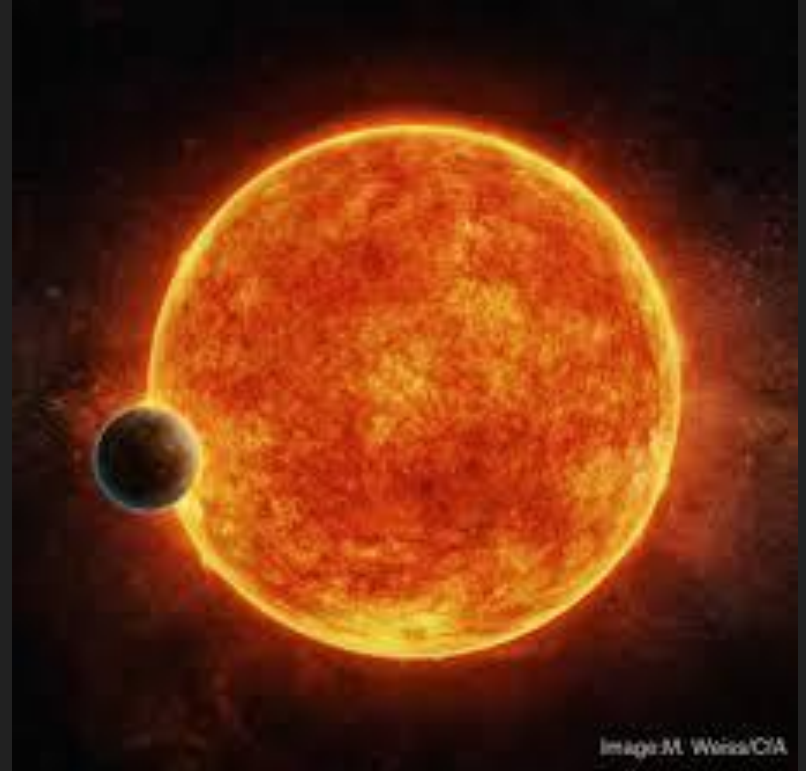
Radial Velocity

- The gravity of an orbiting planets causes the star they are orbiting around to wobble, changing the color of light the star emits
- 751 planets have been discovered using this method



Transit

- When a planet passes between the viewer on Earth and the star it is orbiting, the light of the star is dimmed by a noticeable amount
- This is by far the most effective method for tracking exoplanets
- 3059 planets have been found by using this method



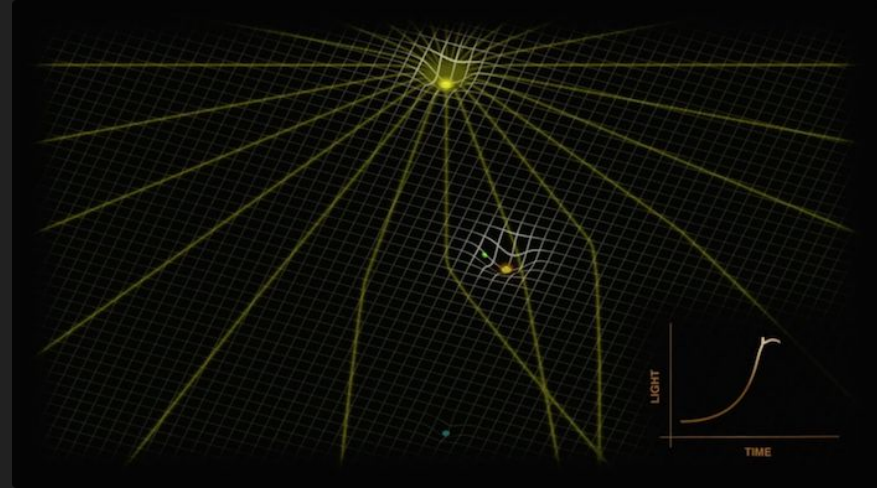
Direct Imaging

- Direct imaging is when the astronomer can take a picture of the planet
- By removing the overwhelming glare coming from the star, planets can be made visible
- 45 planets have been discovered by using this method



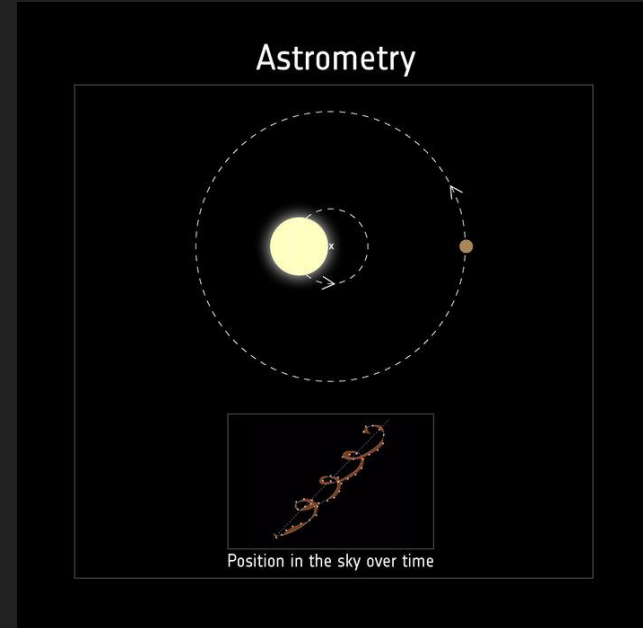
Gravitational Microlensing

- When light from a nearby star is bent due to the planet's gravity as it orbits between the star and Earth
- 75 planets have been discovered using this method



Astrometry

- The gravity from the planet's orbit can cause the star to wobble just a tiny bit
- This is by far the least effective method as it is very hard to detect such miniscule movements
- Only 1 planet has been discovered using this method



Work Cited

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