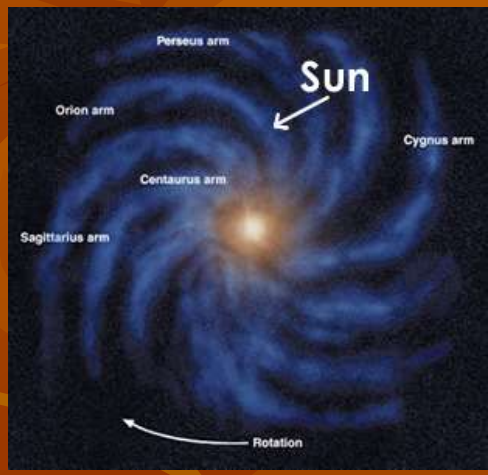
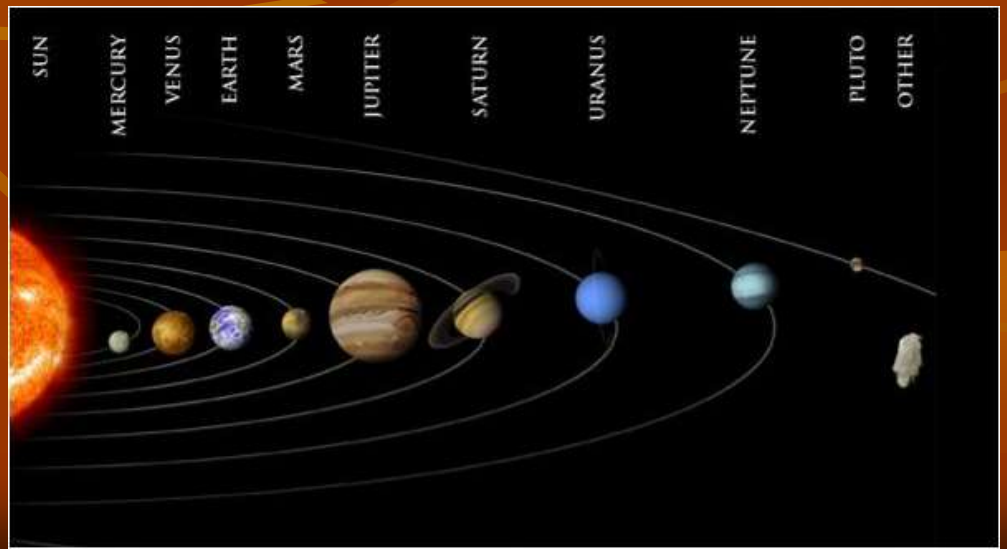
Physical Geography

Notes

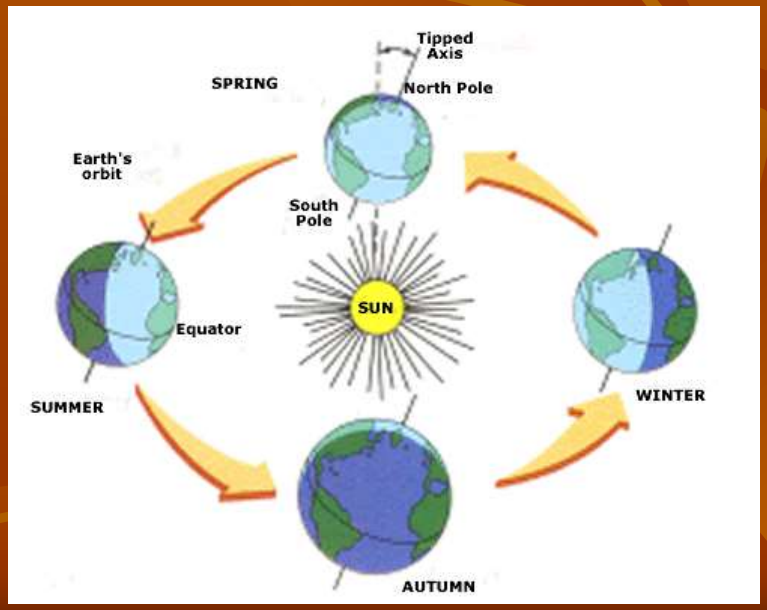
Earth and Space Vocabulary

- Galaxies: large groups of stars such as the Milky way.
- Solar system: The Sun and the group of bodies that revolve around it.





- Rotation: one complete spin of the earth on its axis. 24 hours.
- Revolution: One elliptical orbit, every 365 ¼ days, around the sun.

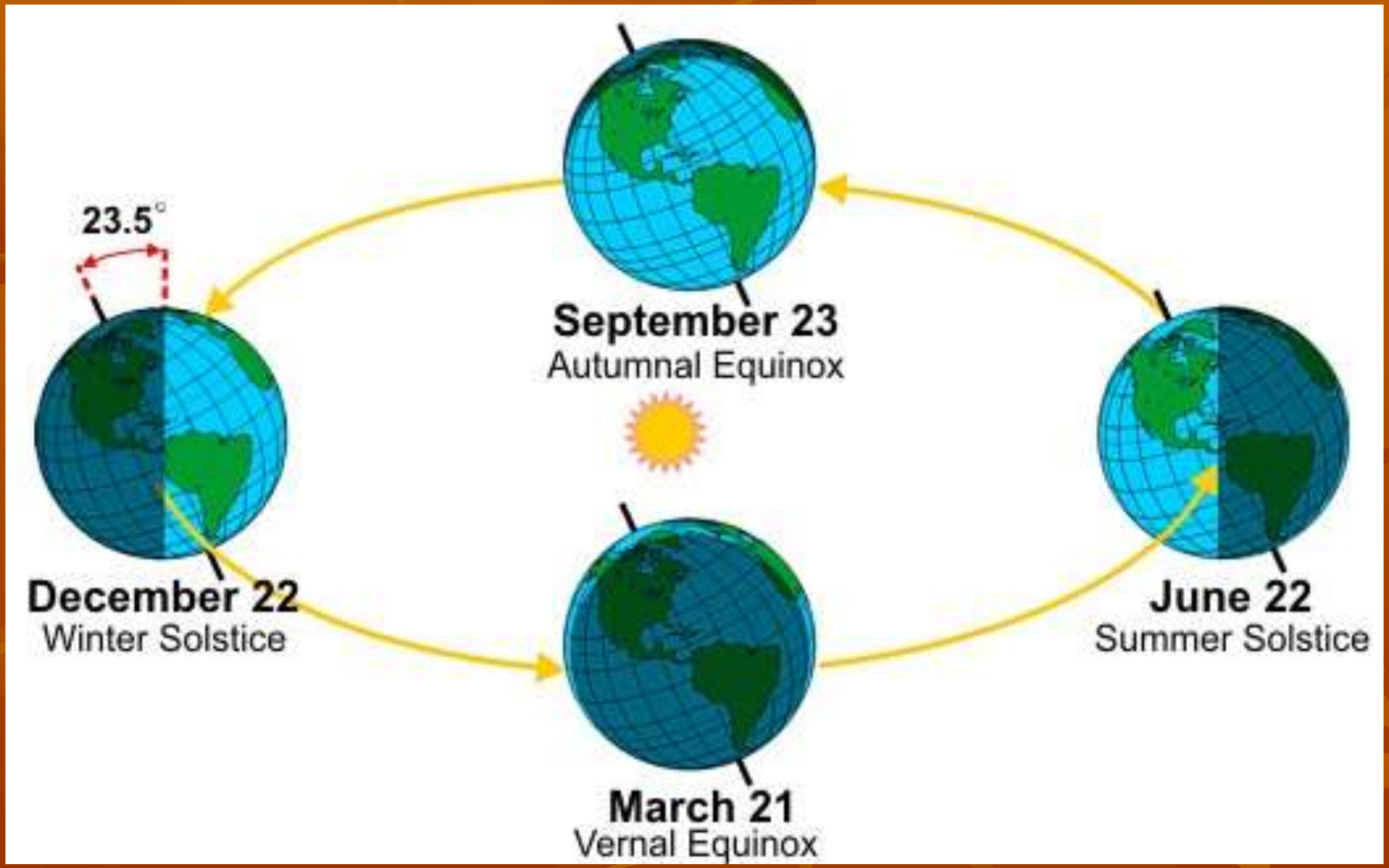


Earth-Sun Relationships

- TROPICS: Warm low-latitude areas near the equator—receive solar energy all year
- POLAR REGIONS: areas that surround the North and South Poles—receive very little solar energy and are cold most of the time.—high latitude.
- MID-Latitude: solar energy changes greatly during the year.

SEASONS

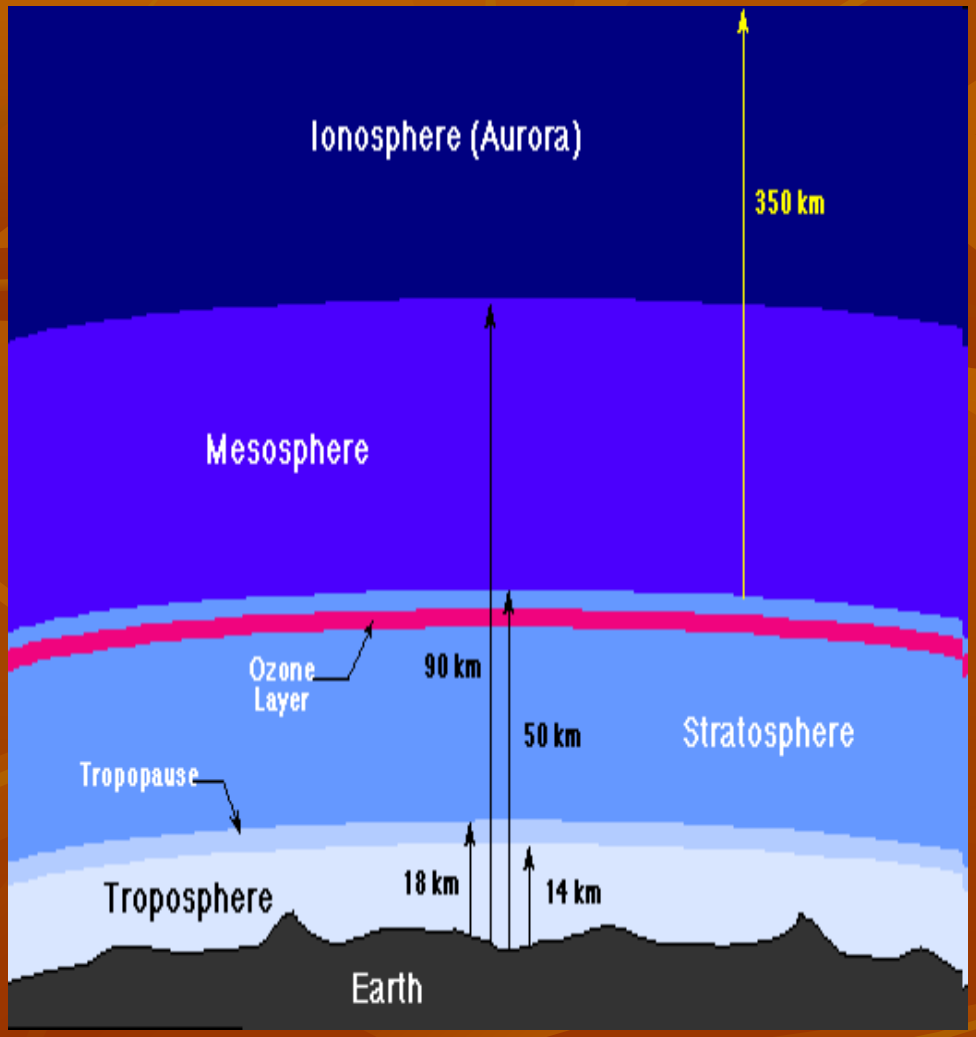
- Summer and winter solstices, June 21/December 21—the days when the sun appears directly overhead at the tropics of Capricorn/Cancer
- Spring and Fall Equinoxes, March 21/September 22—the days when the sun appears directly overhead at the Equator= equal days and nights.


23.5°
September 23
Autumnal Equinox
December 22
Winter Solstice
June 22
Summer Solstice
March 21
Vernal Equinox

Earth's Four Spheres

- The earth is made up of four spheres.
  - 1. ***Atmosphere*** – the envelope of gases that surrounds Earth. It is the least dense and outermost sphere. Goes from Earth's surface into space.

Earth's Four Spheres



- 78% of Earth's atmosphere is nitrogen, and about 21% oxygen
- The atmosphere protects the planet from the Sun's harmful radiation

Earth's Four Spheres

- 2. ***Lithosphere*** – the solid crust of the planet.
  - Includes rocks and soils.
  - Forms earth's continents, islands, and ocean floors.

Earth's Four Spheres

- 3. ***Hydrosphere*** – is all of the Earth's water.
  - Includes liquid, solid, and gas forms.
  - 70% of Earth's surface is covered by water

Earth's Four Spheres

- 4. ***Biosphere*** – includes all life forms.
  - Plants
  - Animals
  - Overlaps other 3 spheres

Environment

- When you add all four spheres together you get ***Environment.***

- ***Biosphere*** + ***Lithosphere*** + ***Hydrosphere*** + ***Atmosphere*** = Environment

Climate and Weather

Vocabulary

- Weather: condition of the atmosphere at a given time and place
- Climate: Weather conditions in a geographic region over a long time.
- Temperature: the measurement of heat
- Greenhouse effect: earth's atmosphere traps heat energy
- Global warming: evidence that shows that Earth has gotten warmer in recent decades.

Precipitation

- Precipitation: water droplets that fall in the form of rain, sleet, snow, and hail
- Evaporation: water changes from a liquid to a gas.
- Condensation: water vapor changes from a gas into liquid droplets.
- Humidity: the amount of water vapor in the air.

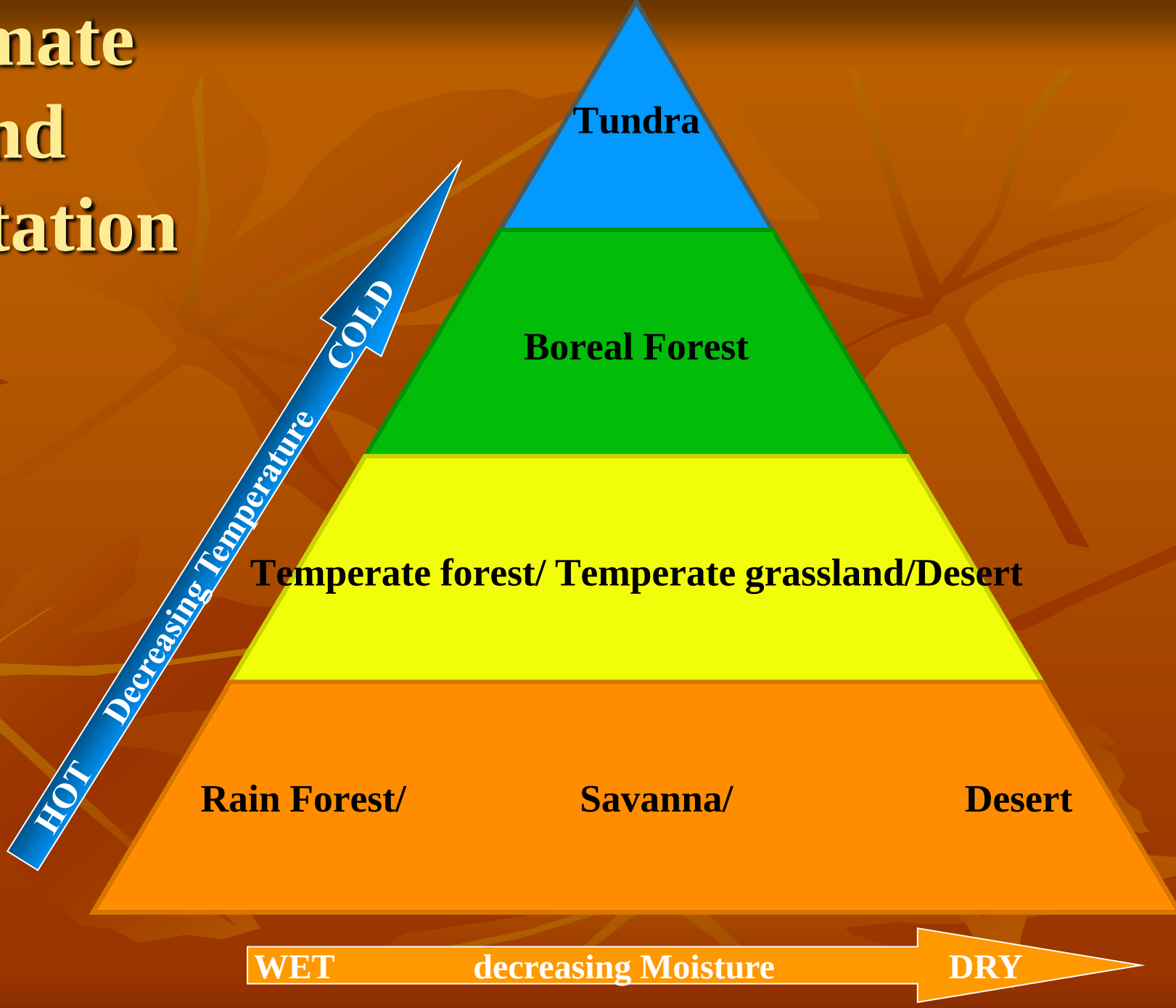
Elevation and Mountain Effects

- An increase in elevation causes a drop in temperature. (why we have snow on mountain tops)
- Orographic effect: when air pushes against a mountain, the mountains force the air to rice. The rising air cools and condenses, forming clouds and precipitation.
- Winward side: receives a great deal of moisture due to wind.
- Leeward side: as air moves down the leeward side, it warms and dries. This drier area is called a rain shadow.

Storms

- Hurricanes: most powerful and destructive tropical cyclones. Heavy rain and winds higher than 155 mph.
- Cyclones: hurricanes in the Pacific.
- Tornadoes: funnel clouds with thunder and lightning.

Climate and Vegetation



Tropical Climates

- Tropical Humid: Along Equator; Equatorial South America, Congo Basin in Africa, Southeast Asia: Warm and Rainy year round with Rain totaling 65-450 inches/year
- Tropical Wet and Dry Climate: Betweeen humid tropics and deserts: tropic regions of Africa, South and Central America, South and Southeast Asia, Austrailia: Warm all year; distinct rainy and dry seasons

Dry

- Arid: centered along 30degree latitude; less than 10 inches of rain/year
- Semi arid: borders deserts and interiors of large continents: about 10-20 inches of rain per yearhot summers and cooler winters with wide temperature ranges.

Landforms, Water, and Natural Resources

Objective

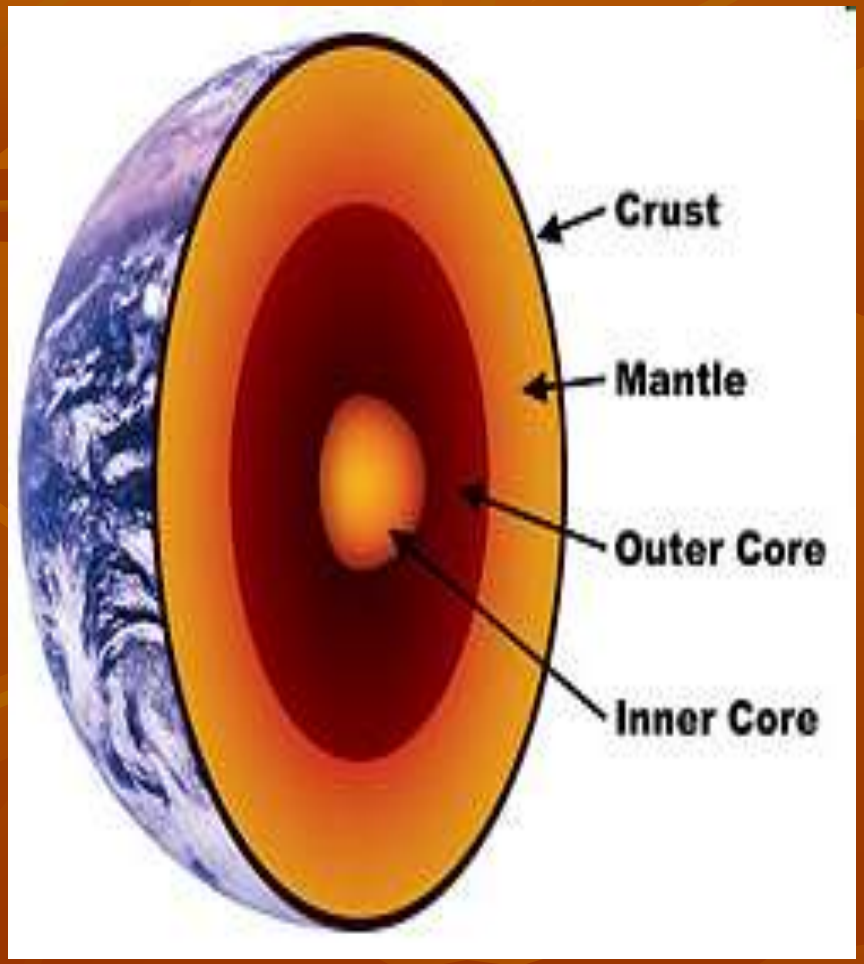
- Students will investigate the physical processes that shape the earth's surface

Energy

- Energy is something that the earth both gives off *and* absorbs. All living species absorb energy in some way.

Forces Below Earth's Surface

- Core
  - The core is like a nuclear furnace where decaying radioactive elements generate heat.

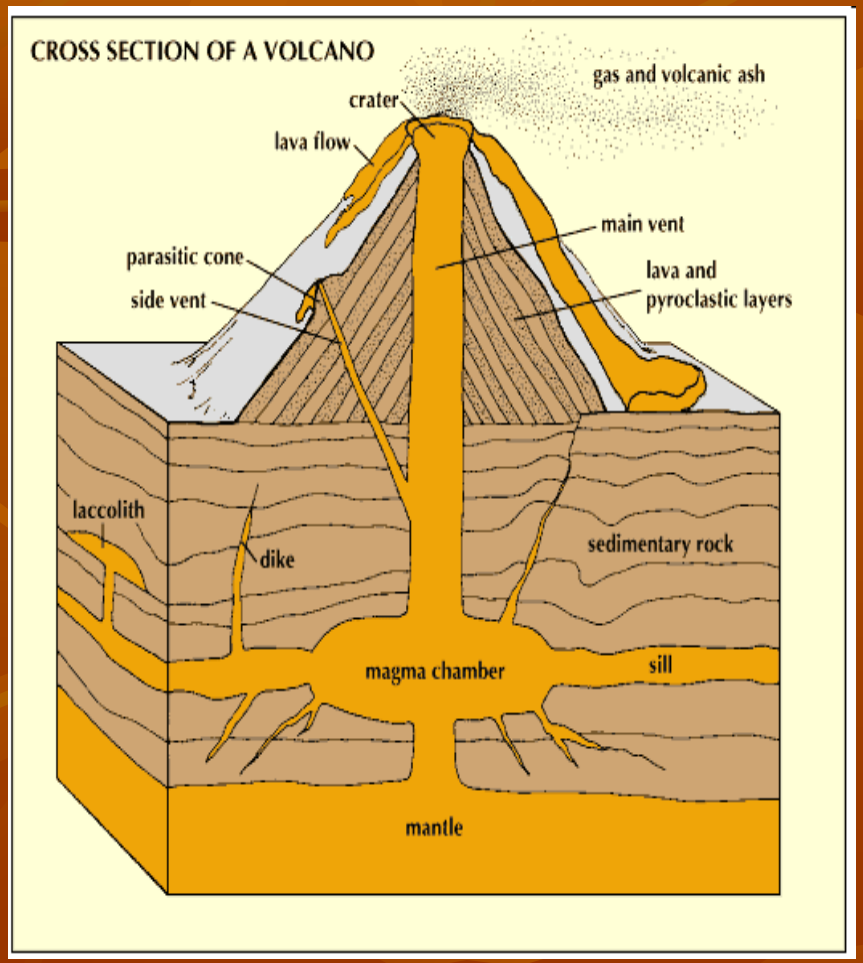


- Divided into *inner* and *outer* layers
  - *Inner Core* is solid
  - *Outer Core* is dense liquid metal, mainly iron and nickel

Mantle

- The mantle is just outside the outer core
  - It contains most of the earth's mass.

Crust



- The uppermost level is the crust.
- Even though the crust is 25 miles thick it is considered relatively thin.
- Huge currents carry heat from the core through the mantle to the crust

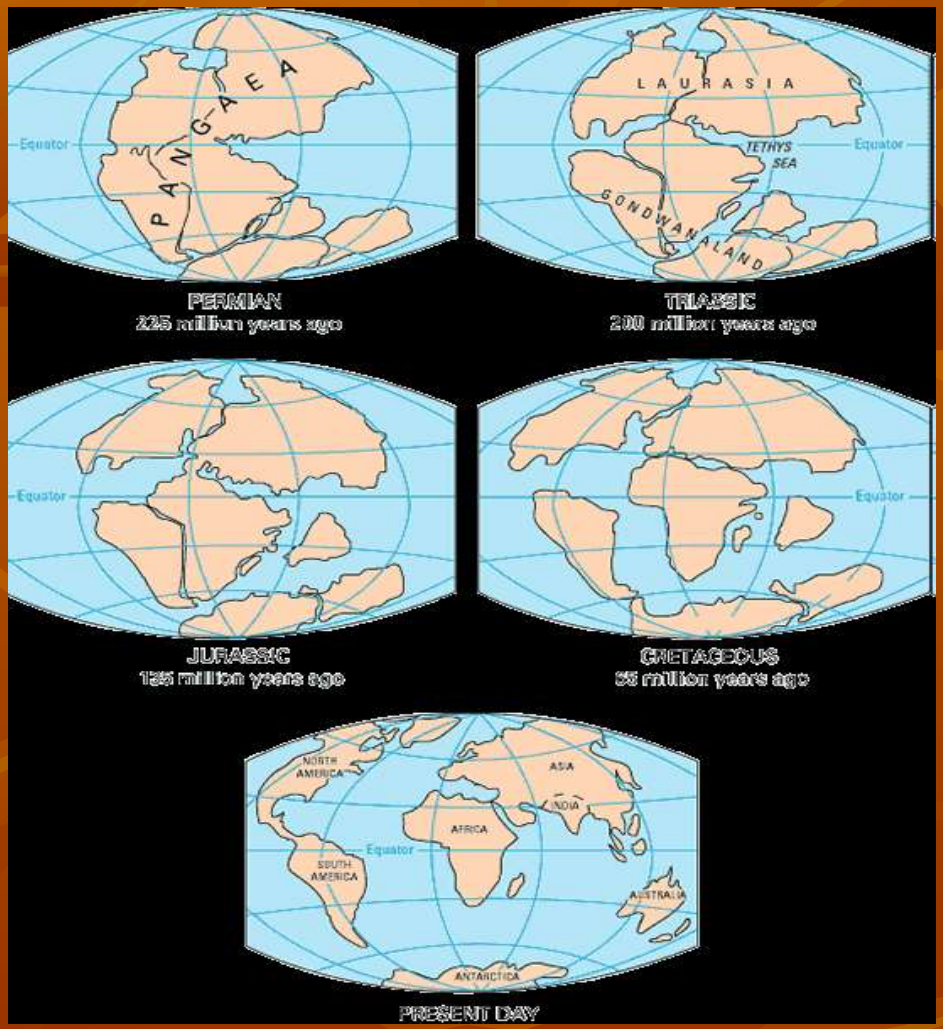
Magma

- ***Magma*** is liquid rock beneath the earth's surface.
- ***Lava*** is liquid rock above the earth's surface

Plate Tectonics

- Plate tectonics explains how forces within the planet create landforms.
- This theory says that Earth's crust is divided into more than a dozen rigid, slow moving plates.
  - They can move as little as one inch per year.
    - (see overhead)

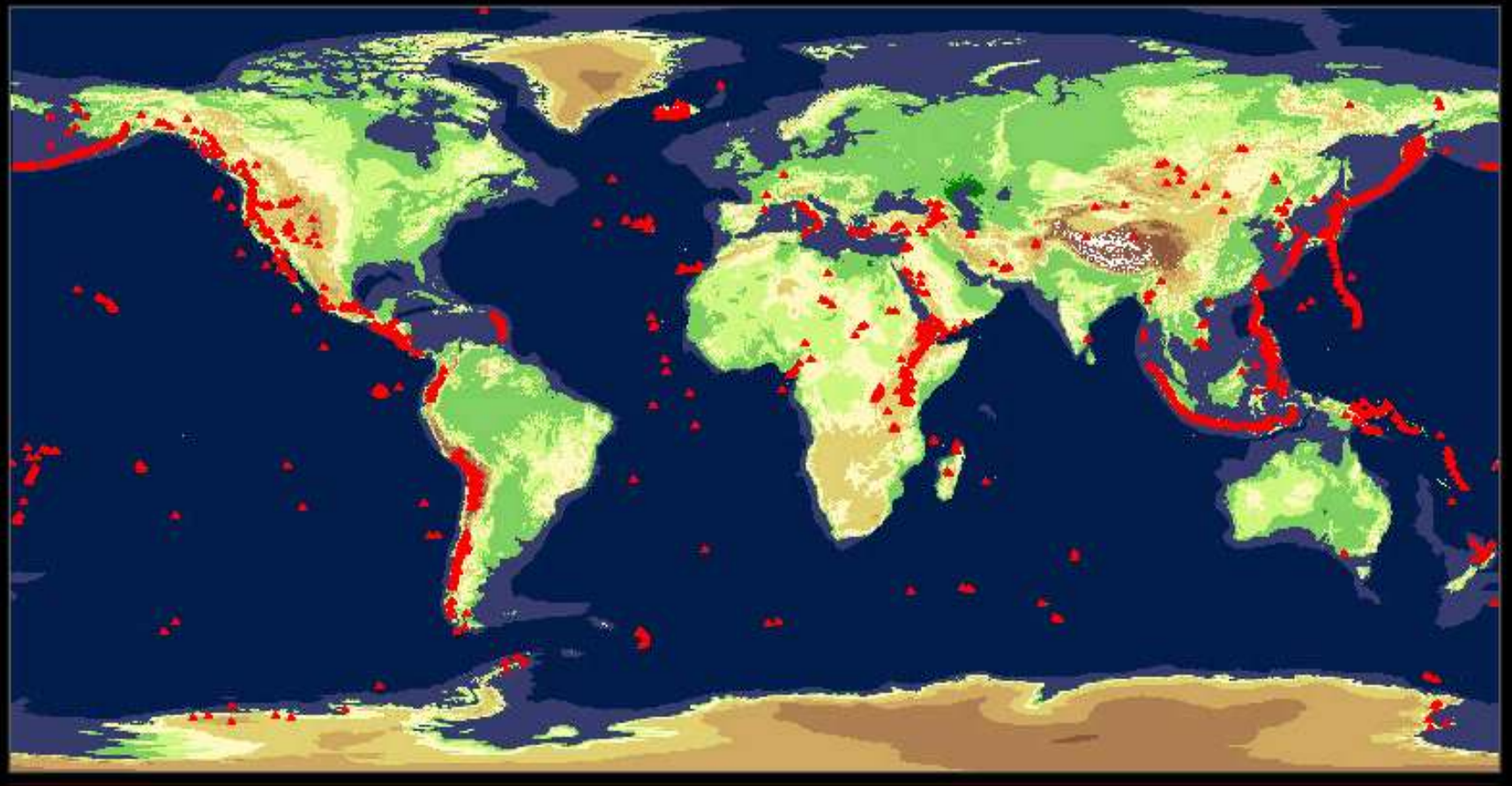
Plate Tectonics



- This process is called continental drift.
- Along plate boundaries the crust is subject to stresses that lead to melting, bending, and breaking.
- In the middle of the plates little tectonic activity occurs.

- Plate boundaries are usually signaled by the appearance of volcanoes
- Scientists believe that this theory can explain the long history of the earth's surface.

Volcanoes of the World



-500 0 250 500 1000 2000 3000 4000 5000 6000 7000 8000 8400

Land Elevation (meters)

Oceanic
Continental
Shelf

MUSEUMS TEACHING PLANET EARTH

Data Source: Smithsonian Institution, Global Volcanism Program.

Pangea

- Scientists believe that 200 million years ago all of the earth's continents were connected into one super continent.

The Split

- As Pangea split, it formed two smaller super continents called:
  - Gondwanal and
  - Laurasia

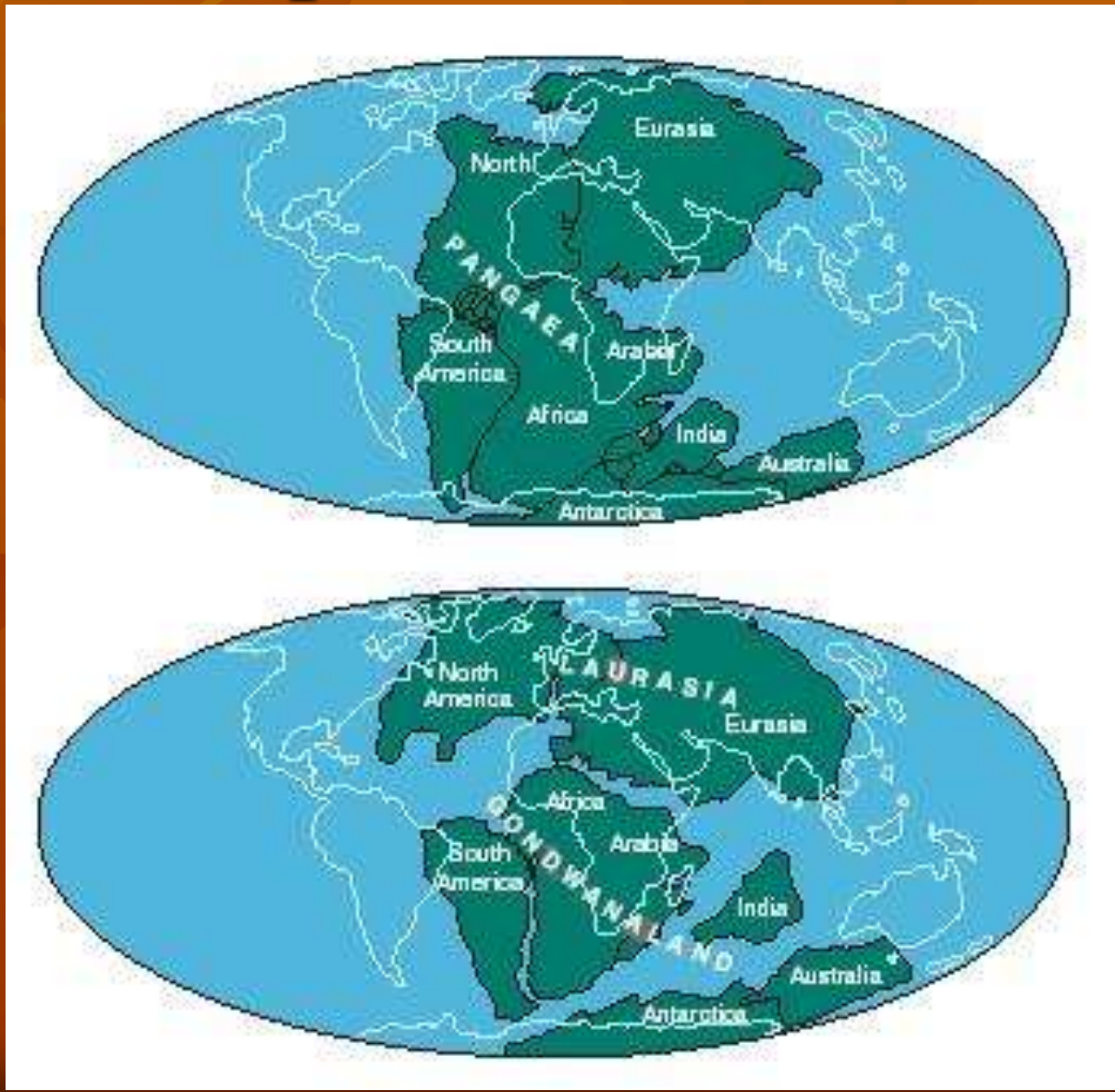
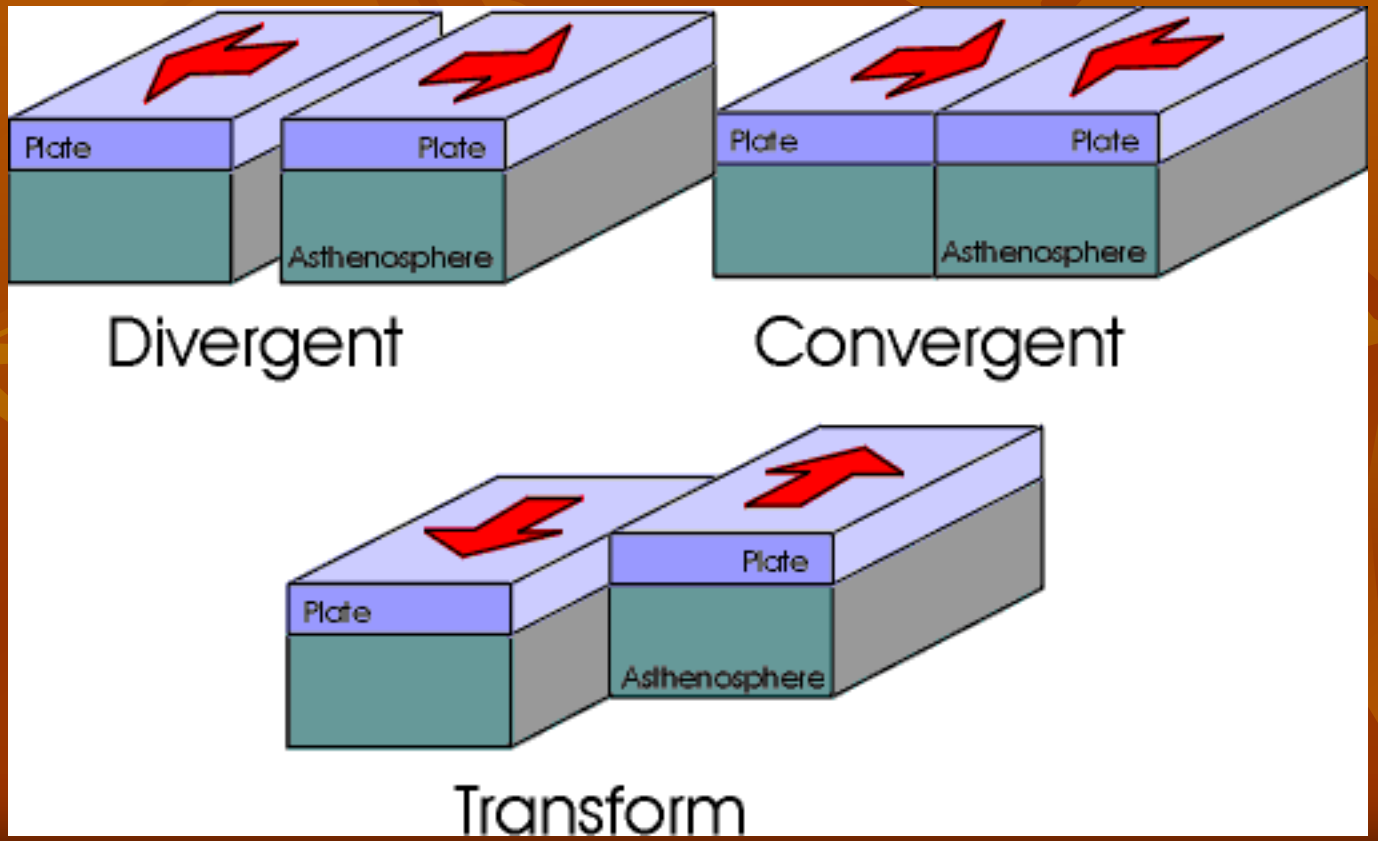
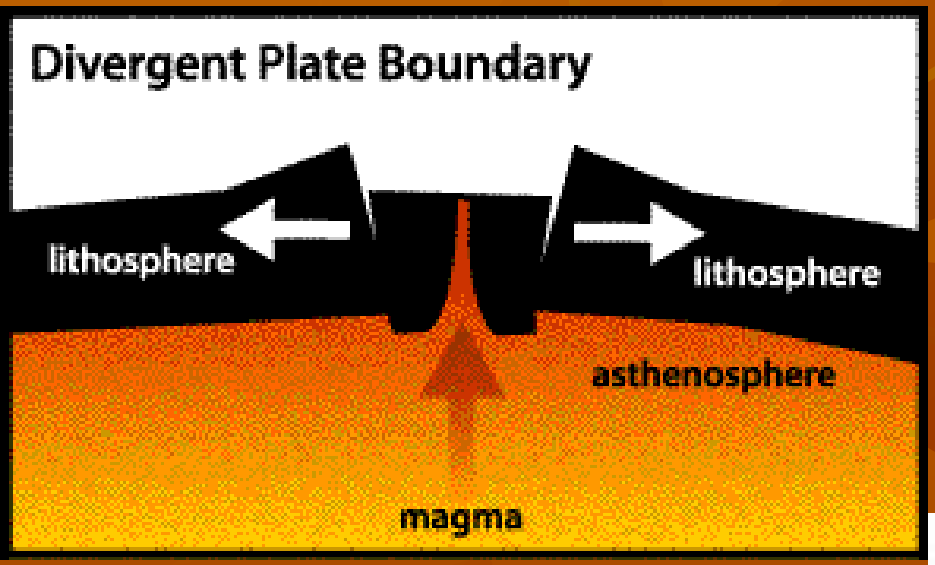


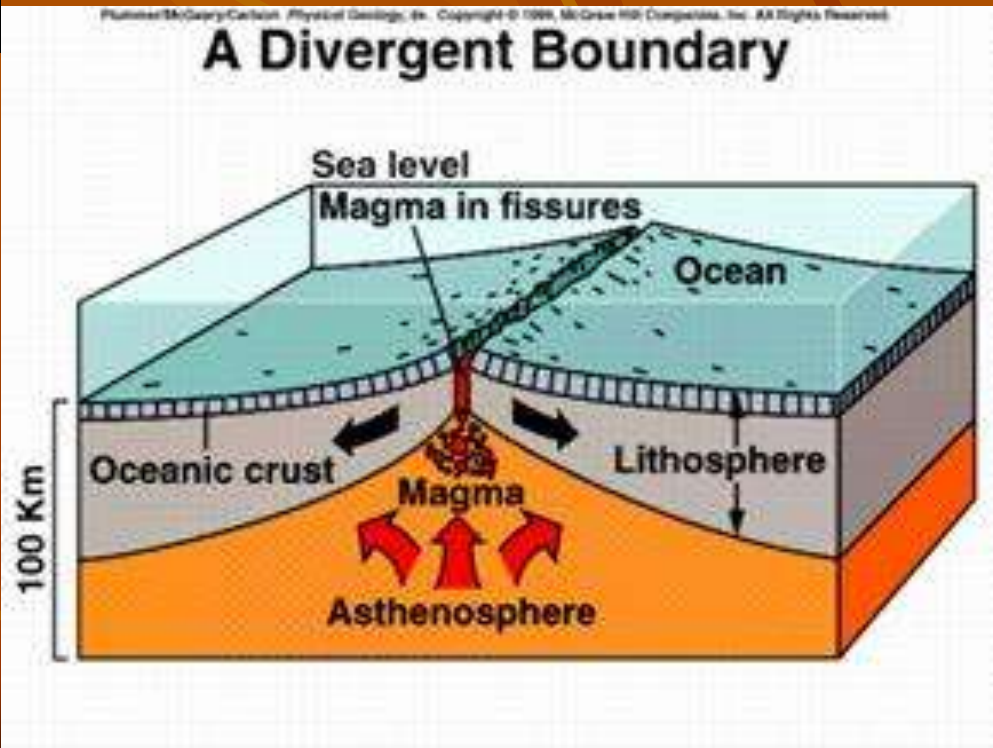
Plate Movement

- When plates move they can move in 3 different ways

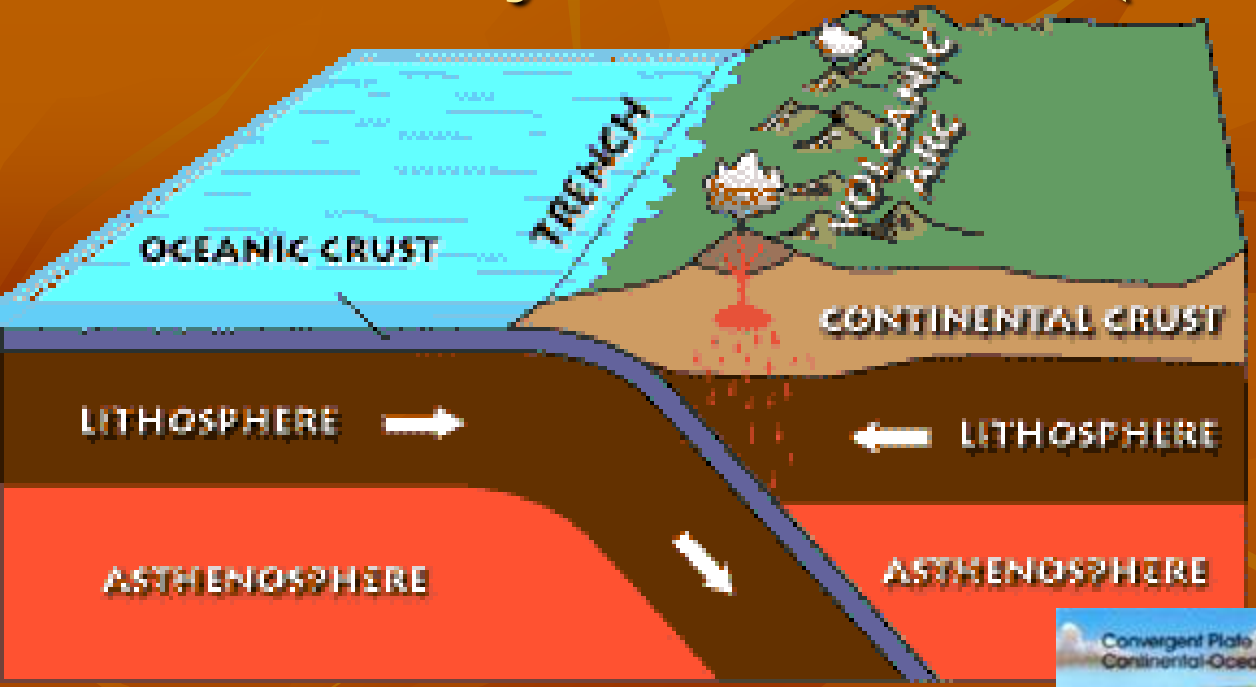


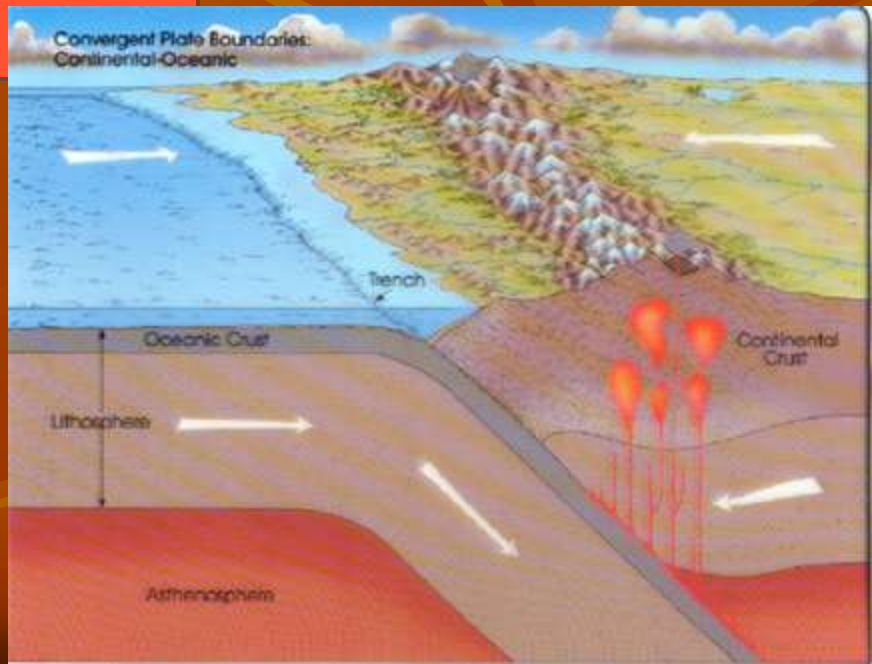
1. They can spread (Divergent)



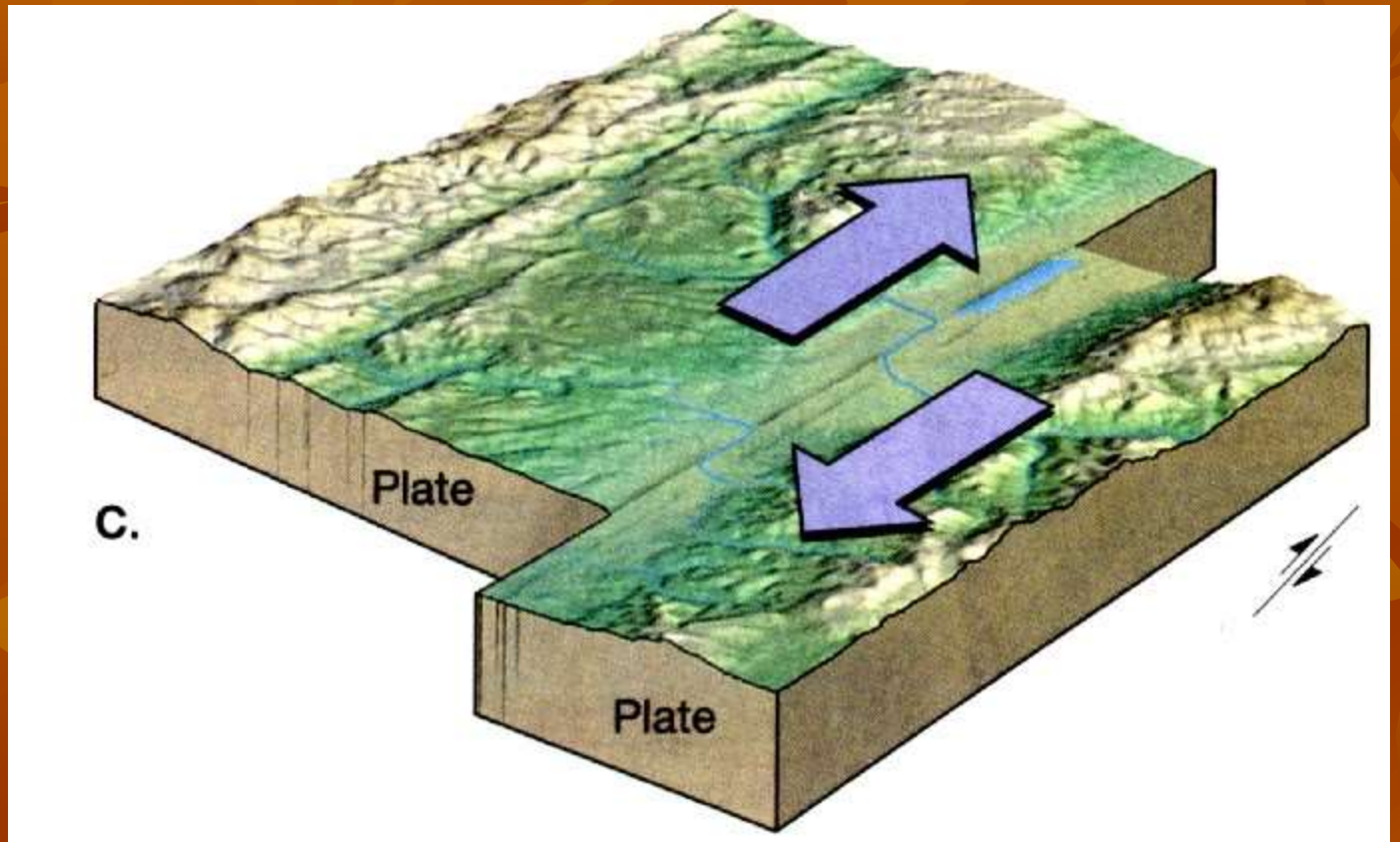


2. They can collide (Convergent)





3. They can move past each other laterally (Transform)



- Over millions of years the earth's crust settled itself into two layers.
  - The lower layer is made up of really heavy rock, usually found on the ocean floor.
  - The upper layer is made up of lighter rock, usually makes up continental landmasses.

H20= Water

- Water is a huge part of the Earth.
- Water is the basis for life on this planet and without it life could not exist.
- Water is such a large part of the Earth that it covers 70% of the planet.

Percentages

- Water is abundant on Earth but not all of it can be easily used or accessed.
- 97%- of the world's water is in oceans and is too salty to use.
- 3%- of the world's water is fresh, but most of it is frozen in the polar ice caps.
- This leaves very little for human use.

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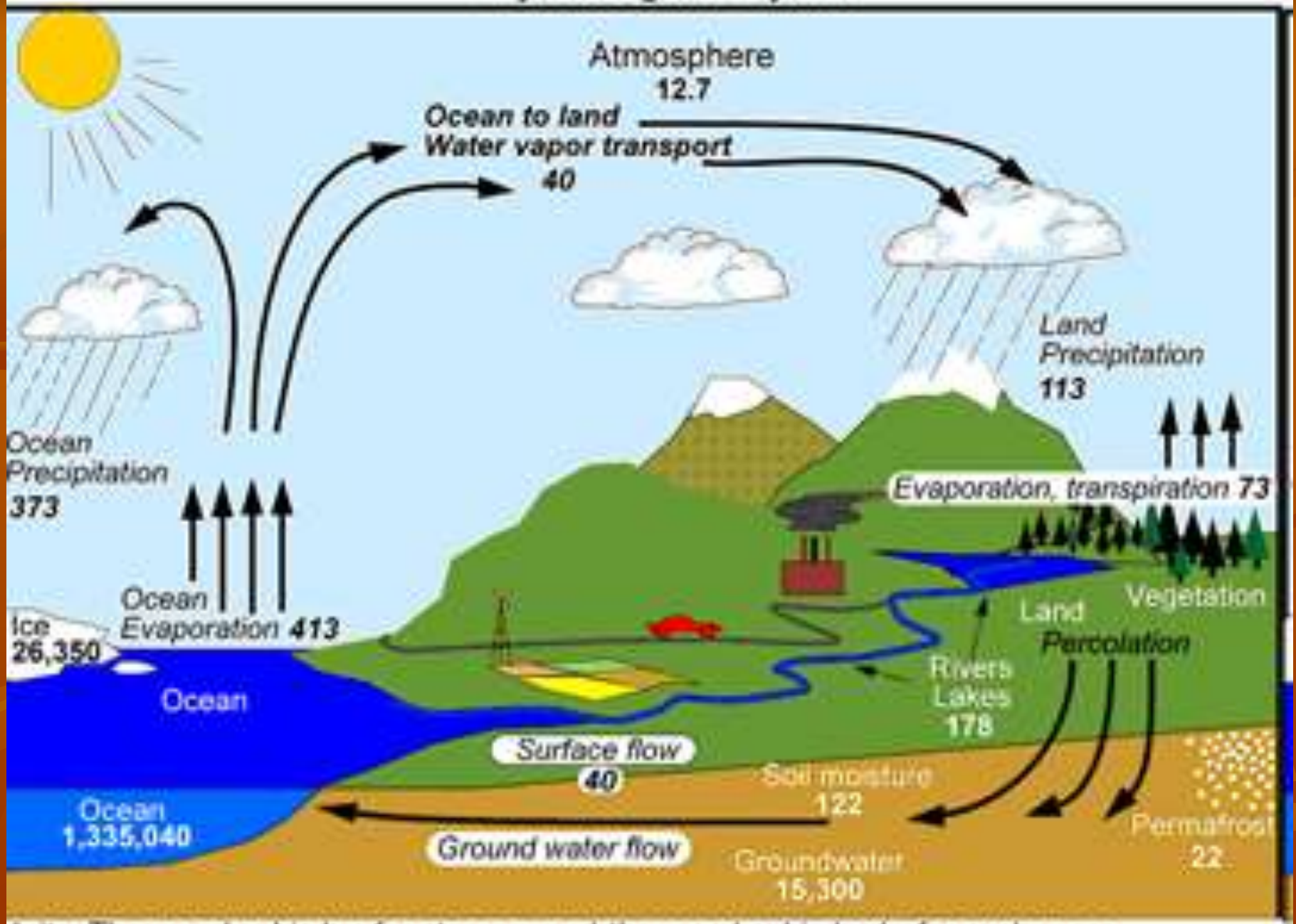
Hydrological Cycle



Units: Thousand cubic km for storage, and *thousand cubic km/yr* for exchanges

Surface Water

- ***Watershed*** **–** the whole region drained by a river and its tributaries.

- ***Desalinization*** **–** the removal of salt from water

- ***Tributary*** **–** any smaller stream or river that flows into a larger stream or river

Water

- ***Groundwater*** **–** water found below ground

- ***Water Table*** **–** level where water fills all spaces underground.