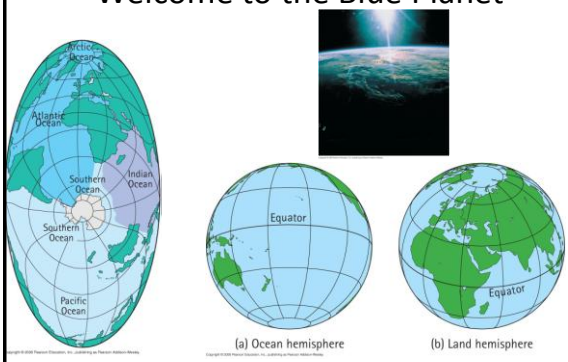
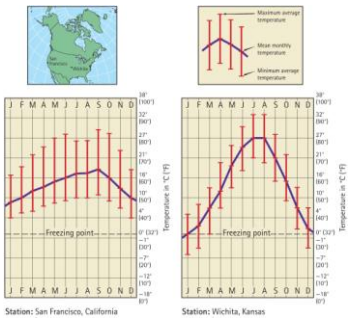
# Oceans

GS 106

## Welcome to the Blue Planet



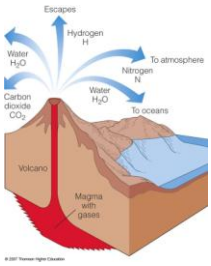

## Atmosphere and oceans




**Work with your neighbor and come up with an explanation for why Wichita's temperature ranges are greater than SF**

## Atmosphere formation

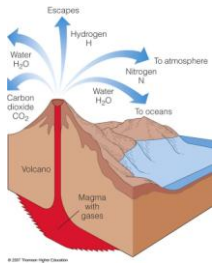
Early atmosphere $CO_2$ and $H_2O$ vapor




$O_2$ introduced through photosynthesis

Present-day stromatolites, Western Australia

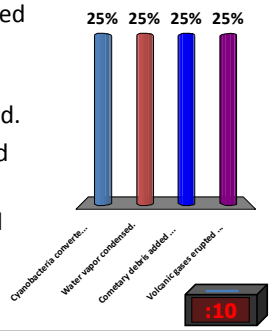
## Ocean formation



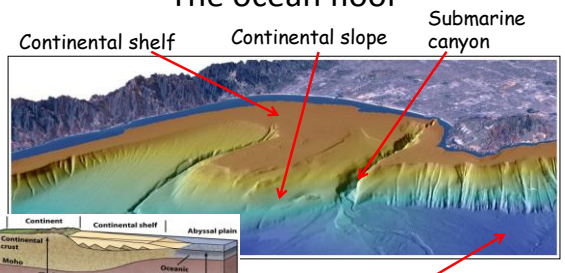

Some of the oldest marine sedimentary rocks from Greenland, 3.8 byr old

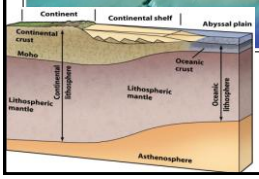
Which of the following occurred **first** in the development of Earth's atmosphere?

1. Cyanobacteria converted carbon dioxide to oxygen.
2. Water vapor condensed.
3. Cometary debris added water to Earth.
4. Volcanic gases erupted from Earth's interior. ✓

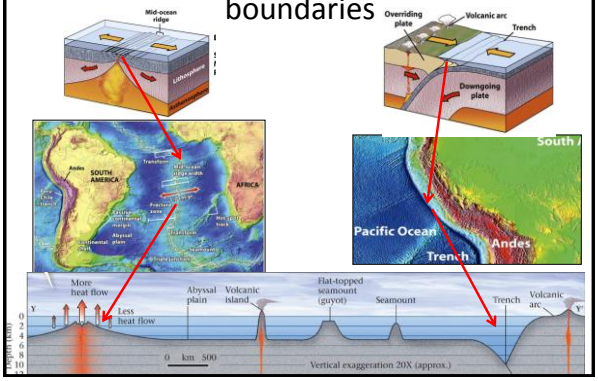



## The ocean floor



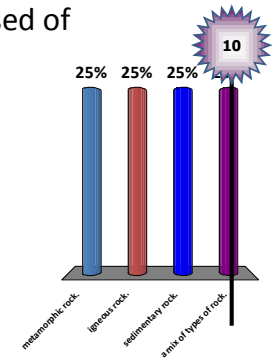




## Seafloor features reveal plate boundaries



## The midocean ridge system is composed of

1. metamorphic rock.
2. ✔ igneous rock.
3. sedimentary rock.
4. a mix of types of rock.

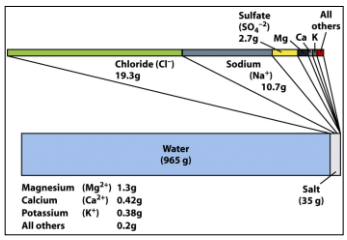



## Seawater composition

**Salinity** is the concentration of salt in water.

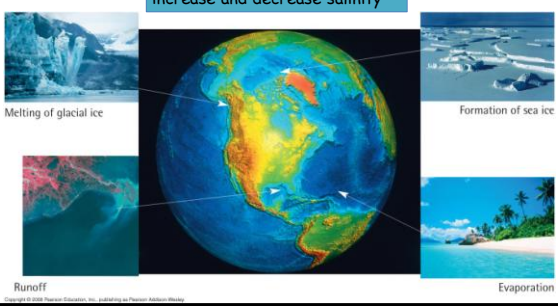
Salinity averages **3.5%** in the oceans

Working with your neighbor, discuss *how the oceans get salty….*



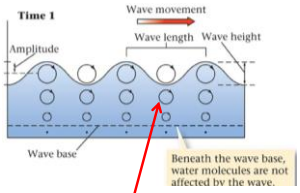

## Increasing/decreasing salinity

Work with your neighbor to determine which processes will increase and decrease salinity



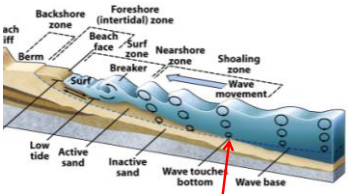

## Waves

Important definitions:
- Crest
- Trough
- Wavelength
- Wave base



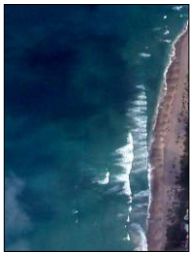

Note how water moves in a circle

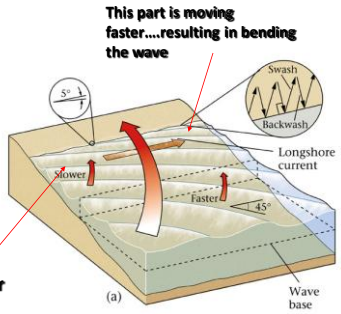
## Waves in the surf zone


As waves approach the shore wave base hits bottom

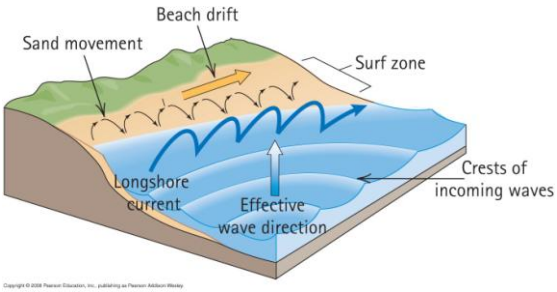
## Wave refraction: waves bend as they approach the shore






This part is moving slower

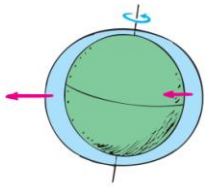
## Longshore current transports sediment along a coast

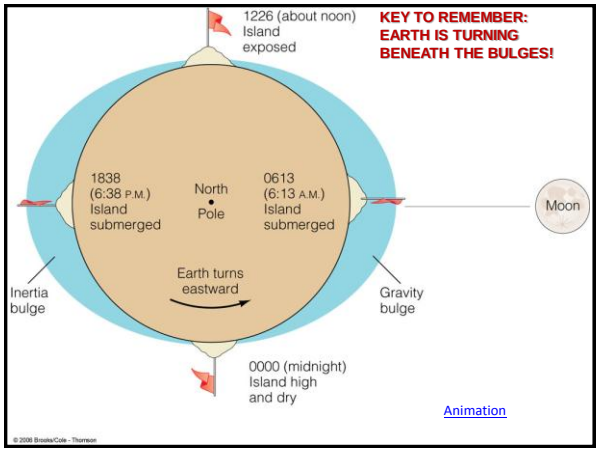



## Tides

But first, a word about gravitational force.

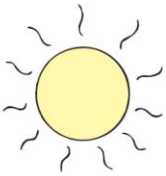
1) Anything with mass exerts a gravitational force on anything else with mass.
2) Gravitational force weakens with distance.





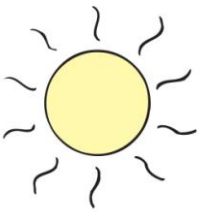

## Spring tides

Work with your neighbor to determine what moon phase occurs during spring tides.



## Neap tides

Work with your neighbor to determine what moon phase occurs during neap tides.



## Other factors influence the height of tides

The Bay of Fundy has one of the world's largest tidal ranges of over 50 feet!

What causes tides?

1. The gravitational pull of the Sun versus that of the Moon.
2. The differences in the gravitational pull of the Moon on opposite sides of Earth.
3. Centrifugal force.
4. All of the choices.