

# Vocabulary

Start reading and answering

- Water Cycle
  - Evaporation
  - Condensation
  - Relative Humidity
  - Collection <sup>-ponds</sup>  
<sub>rivers, lakes</sub>
  - Transpiration
  - sea breeze
  - land breeze
  - Coriolis Effect
  - ~~heat capacity~~ ✓
  - Global Winds
- Precipitation <sup>/underline new info pgs 122-129</sup>
  - Clouds

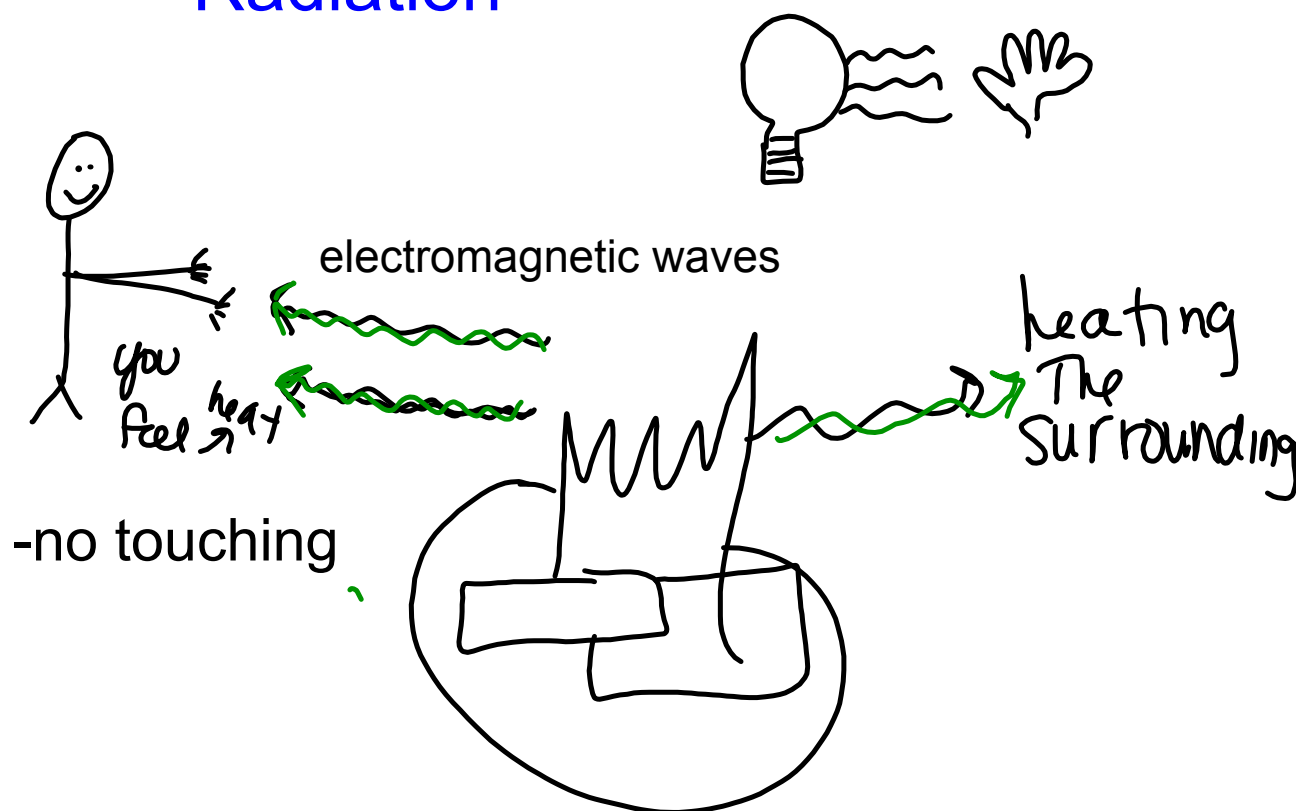
-Winds Coriolis 513  
508-515

Water  
RH 528 - 526 - 530 clouds  
Cycles - 122-129

# Vocabulary

- sea breeze ✓
- land breeze ✓
- Coriolis Effect
- heat capacity
- Global Winds

## Radiation



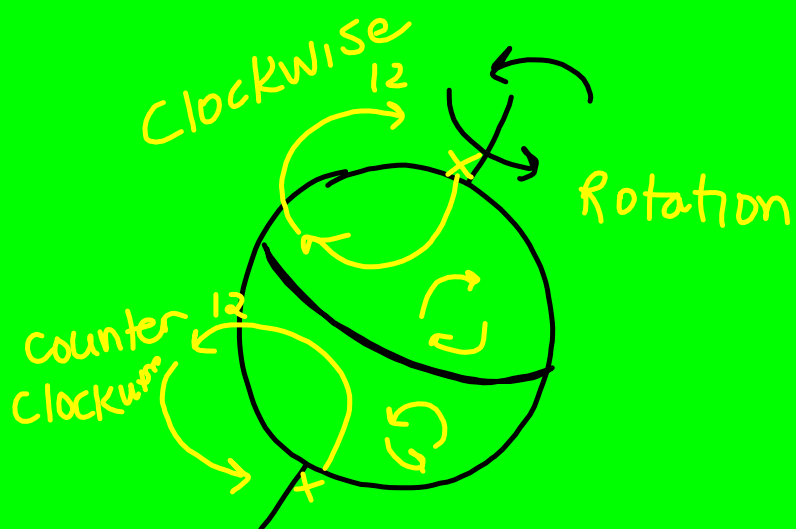
# 1. Vocab

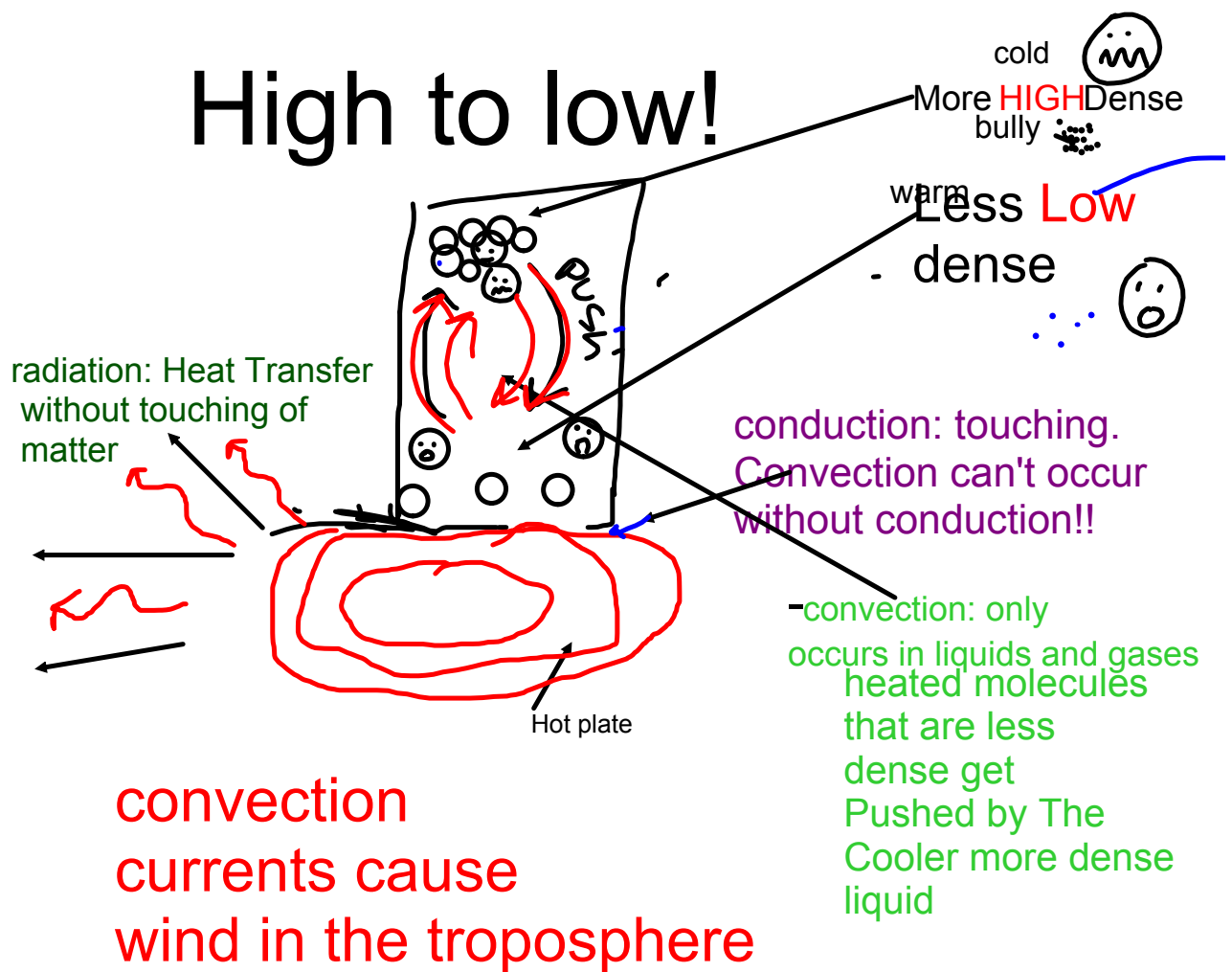
2. Start reading and answering/underline new info pgs 122-129

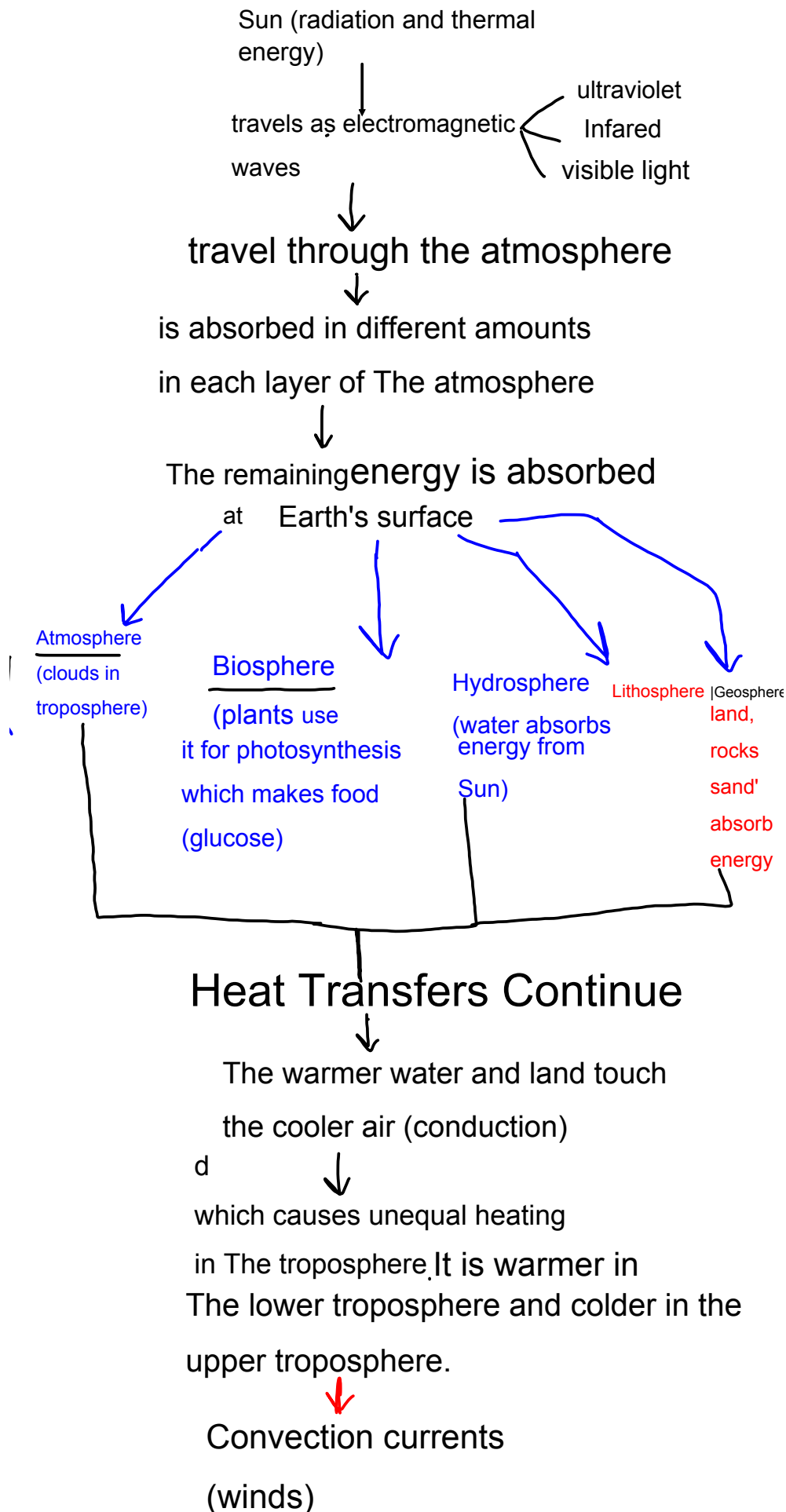
1 of your points  
is the underline

# 3. Correction / late work Science









# Demonstration of Land and Sea Breezes



lamp = Sun



water  
ocean  
lake  
rivers

sand  
lithosphere

Starting temperature:  
Water:  $21^{\circ}\text{C}$  land:  $21^{\circ}\text{C}$

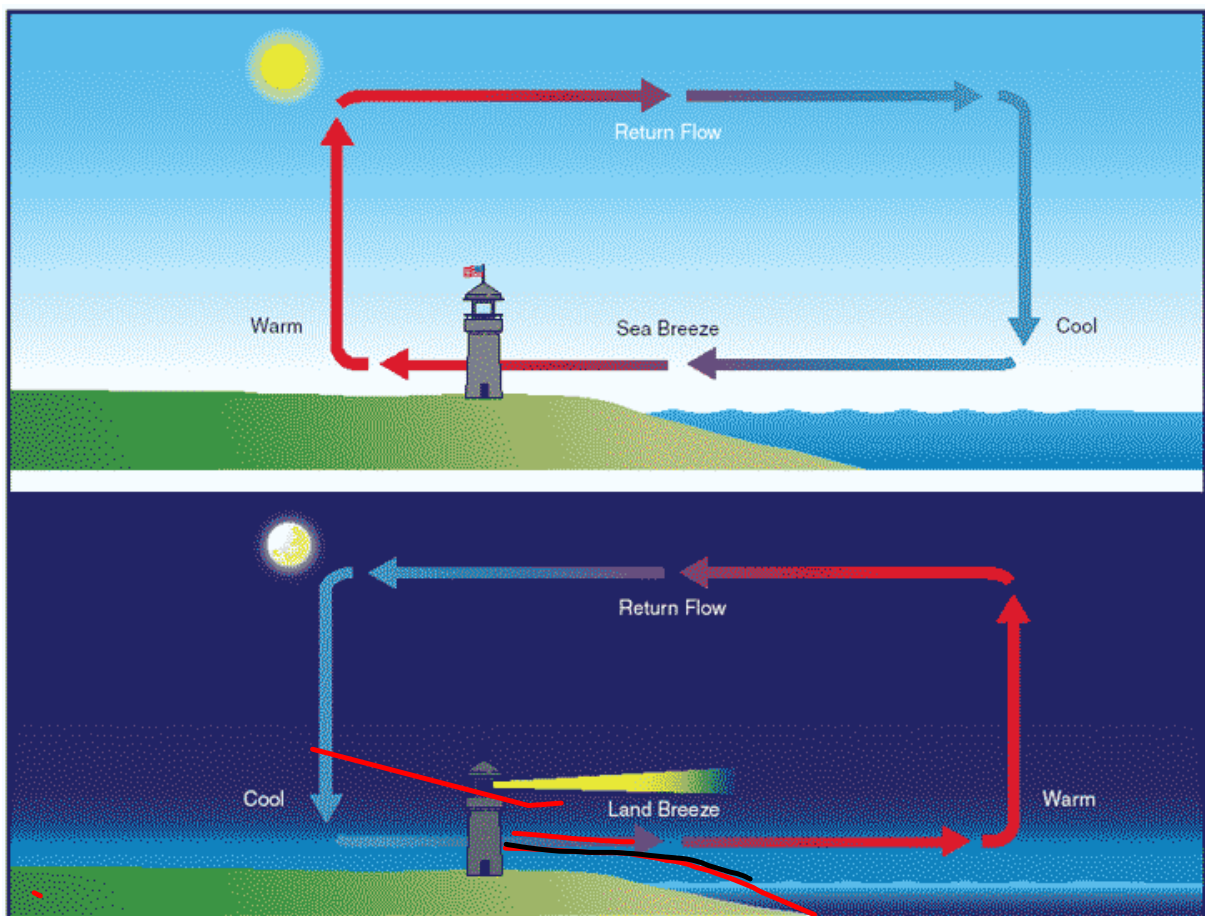
water after 3 min:  $21^{\circ}\text{C}$  land after 3 min:  $23^{\circ}\text{C}$

water after 5 min:  $22^{\circ}\text{C}$  land after 5 min:  $25^{\circ}\text{C}$

\*Light off (night)\*

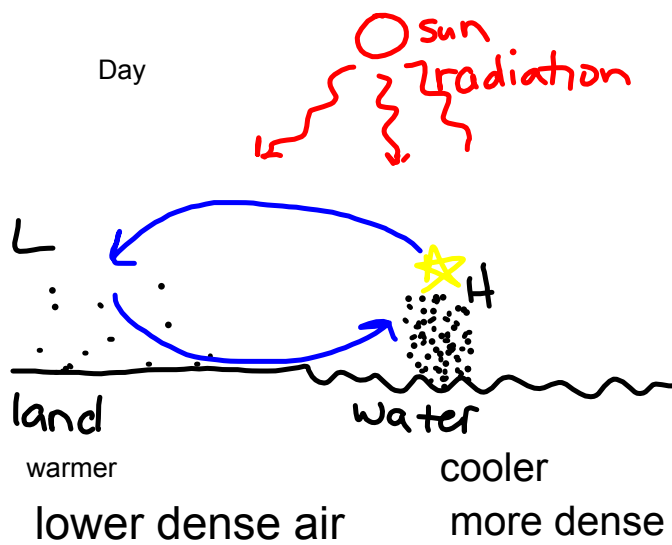
7 min water:  $22^{\circ}\text{C}$   
7 min land:  $21^{\circ}\text{C}$

## Land and sea Breezes (Local winds)

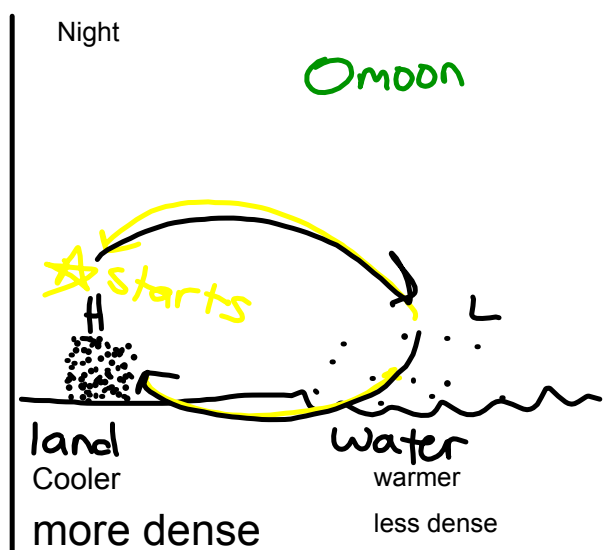


\* High to LOW (H→L) \* ~~start~~

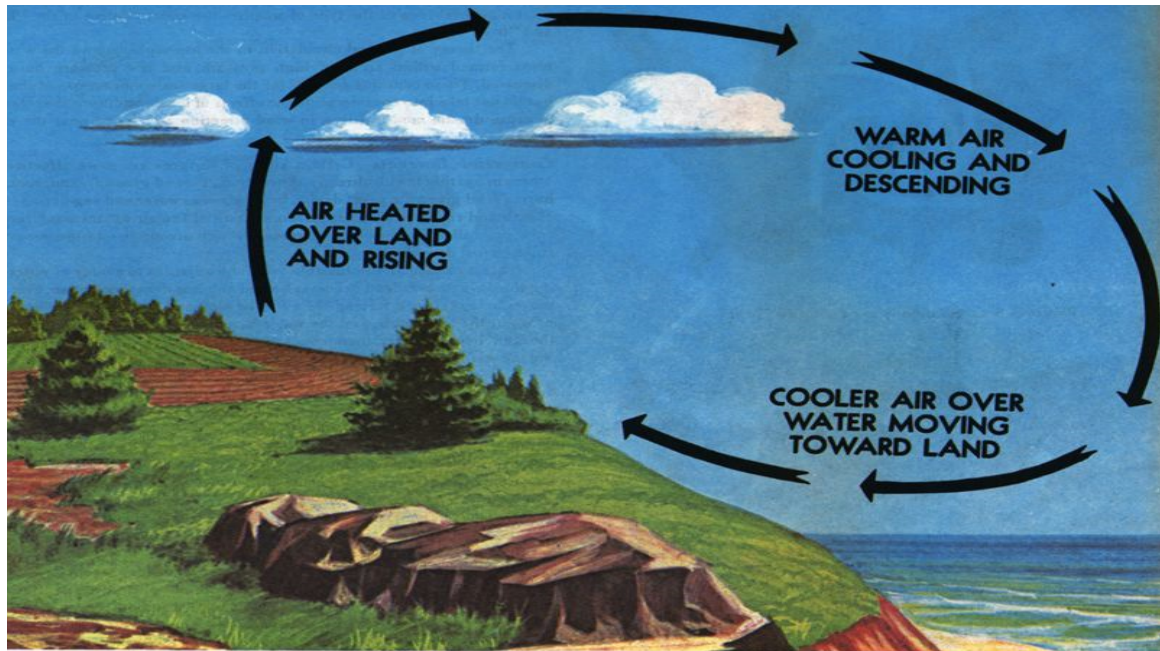
Land and Sea Breezes



Sea Breeze



Land Breeze



## Sea & land breezes

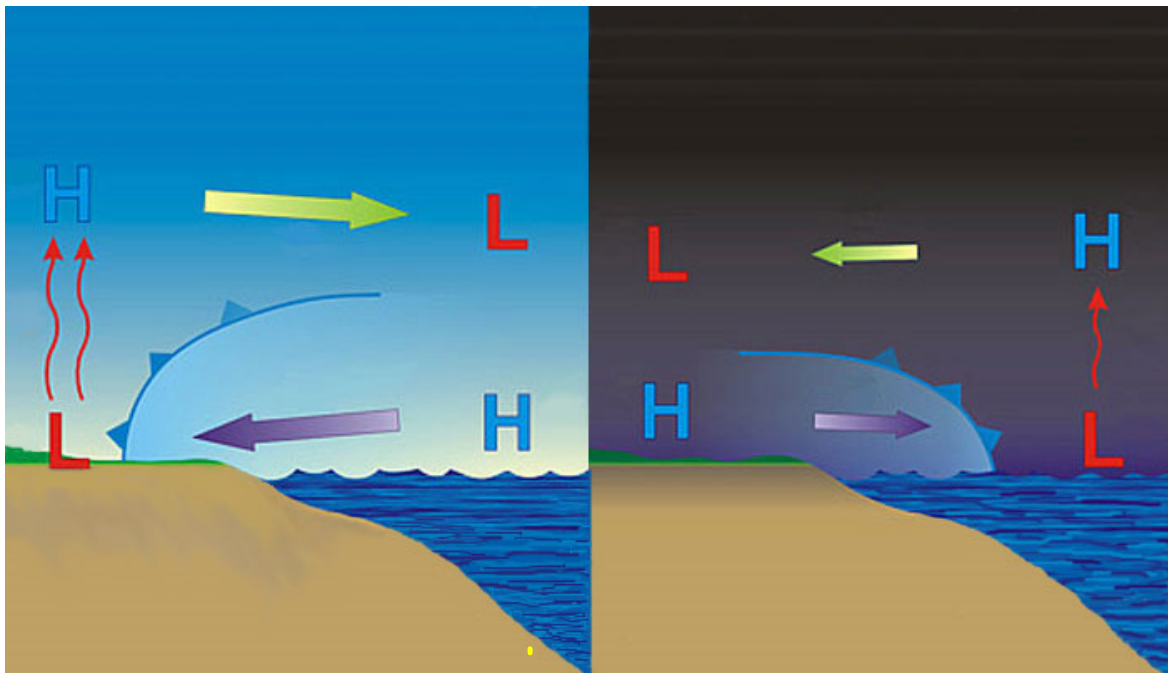
Lithosphere: (land): heat quickly during the day and cools quickly at night

Lithosphere day → Night

less dense → more dense  
 clay H → L

Hydrosphere (water) heats slowly during the day and cools slowly at night

day cool night warm  
 (in) (o)

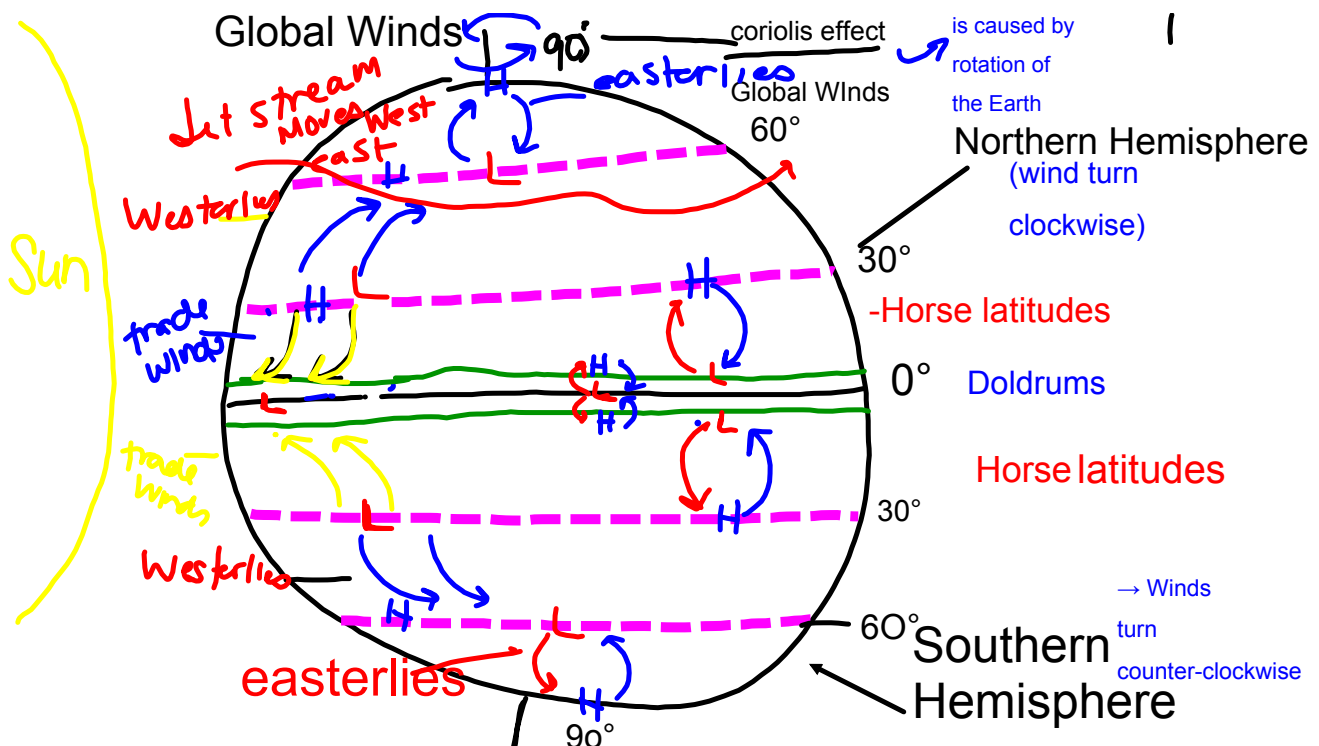


[http://www.classzone.com/books/earth\\_science/terc/content/visualizations/es1903/es1901.cfm?chapter\\_no=visualization](http://www.classzone.com/books/earth_science/terc/content/visualizations/es1903/es1901.cfm?chapter_no=visualization)

### Land and Sea Breezes



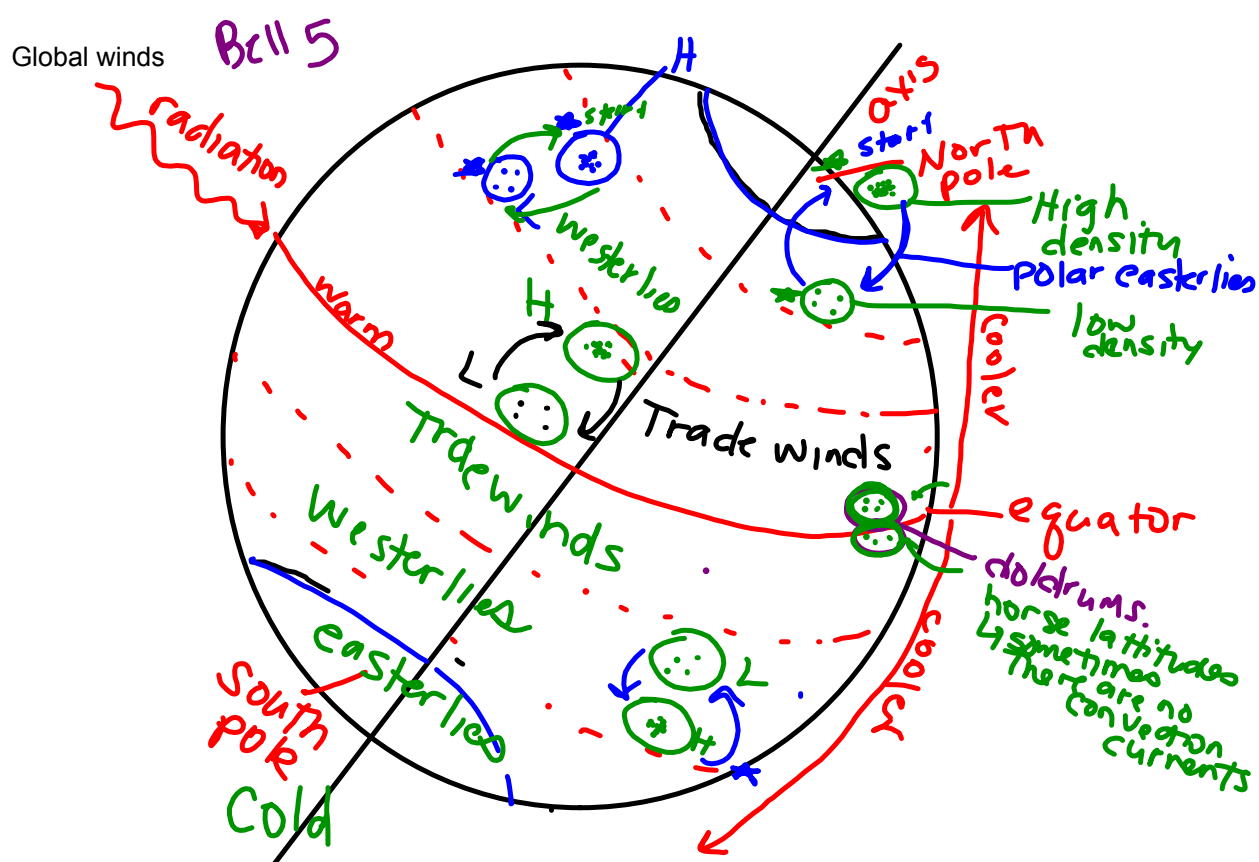




[http://www.mhhe.com/biosci/genbio/tlw3/eBridge/Chp29/animations/ch29/global\\_wind\\_circulation.swf](http://www.mhhe.com/biosci/genbio/tlw3/eBridge/Chp29/animations/ch29/global_wind_circulation.swf)

global winds

HIGH TO LOW





[http://www.classzone.com/books/earth\\_science/terc/content/visualizations/es1904/es1.cfm?chapter\\_no=visualization](http://www.classzone.com/books/earth_science/terc/content/visualizations/es1904/es1.cfm?chapter_no=visualization)

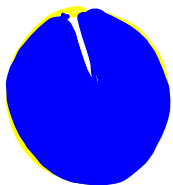
coriolious



<http://www.ems.psu.edu/~fraser/Bad/BadCoriolis.html>

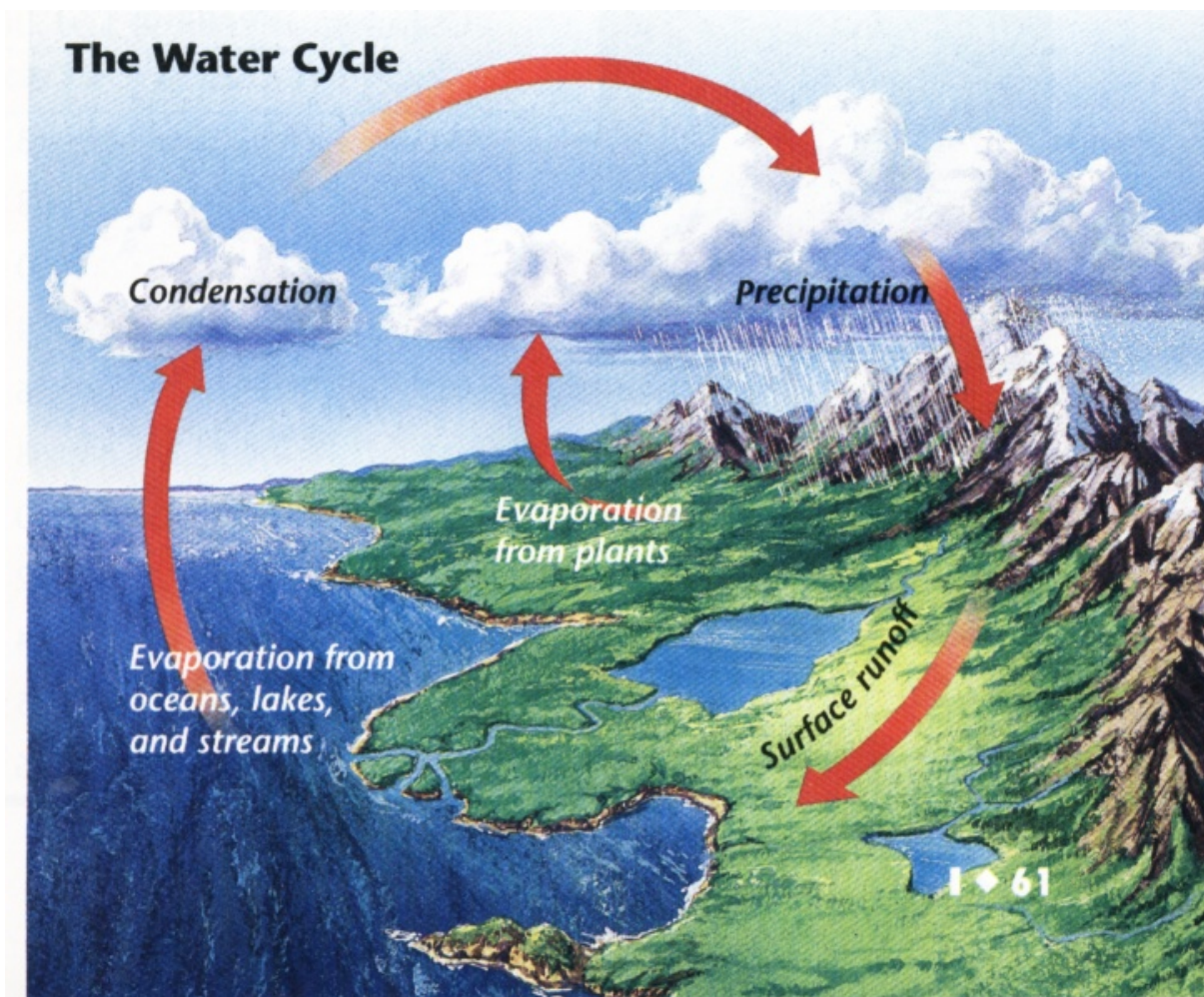


## Water, water everywhere, but 70% not that we can drink!

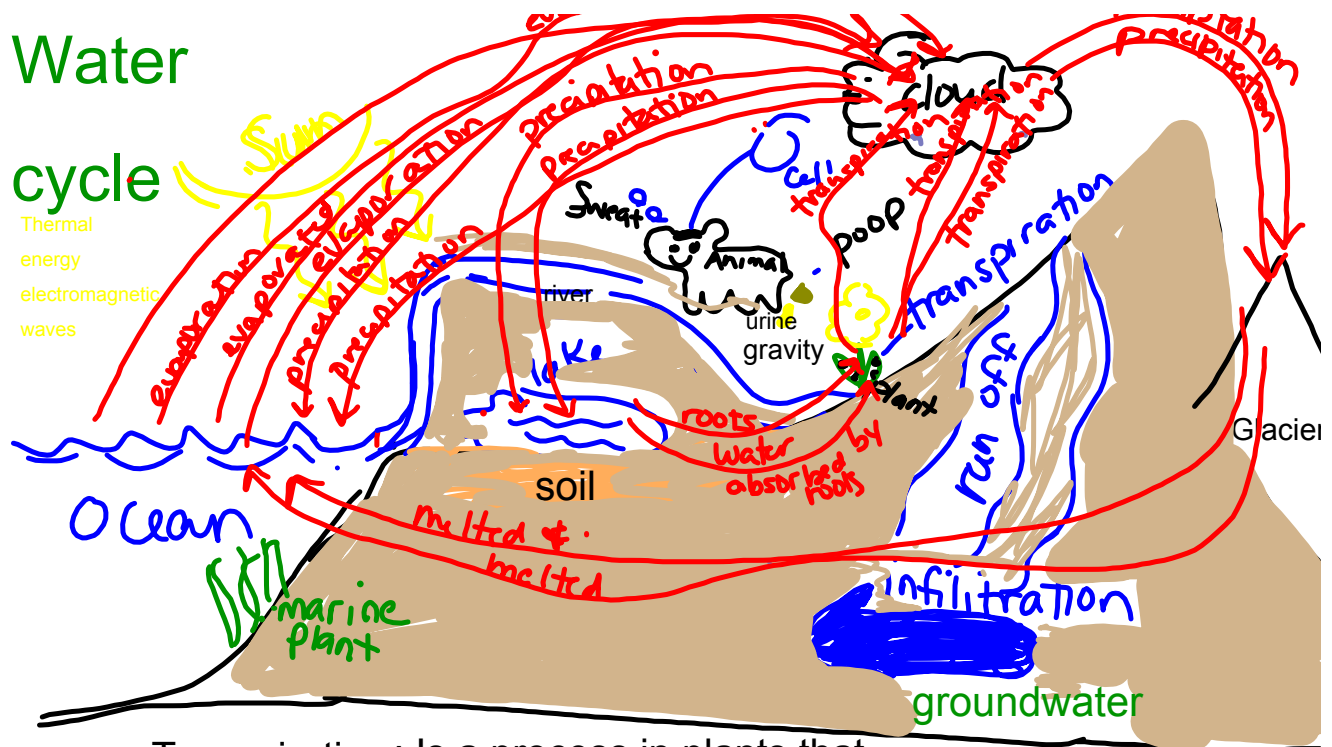


97%  
Ocean

- Seventy percent of Earth is covered by water. In the atmosphere, rivers, oceans, groundwater, and elsewhere on Earth there is a total of more than 326,000,000 trillion gallons of water. Less than one percent of that water is present in rivers, lakes, and groundwater: we use these sources for our drinking water. Most of it—97 percent—is in the oceans. The oceans distribute heat around the planet, keeping heat and cold circulating by way of surface currents.



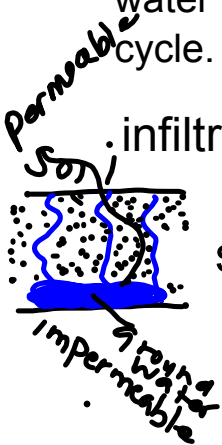
.If your location changes then water will  
**take : more than one path**



Transpiration: Is a process in plants that

Occurs on the bottom of the leaf. The Stoma which is a mouth like opening, releases water vapor into the atmosphere to become a part of The water cycle.

infiltration: The process where liquid water is pulled by gravity down into the spaces in soil. Not all soil can pull water through it. This type of soil (clay) is impermeable. This area. Is where water gathers underground and it is called groundwater



Collection: Is a collection / gathering of water above ground on impermeable soil. (Rivers, lakes, ponds)

SDI1	
lake	



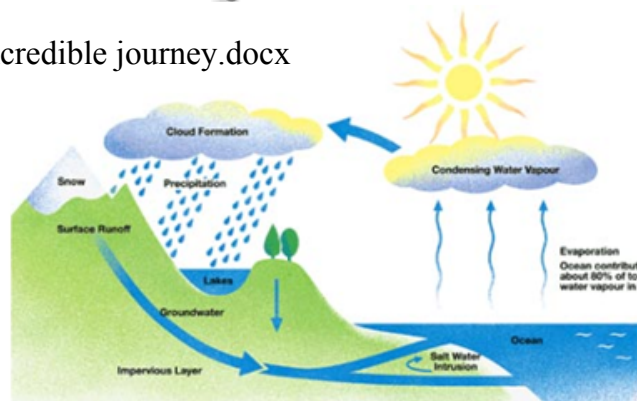
# The Water Cycle

- This continuous process of precipitation and evaporation is called the **water cycle**, or hydrologic cycle.

water cycle incredible journey.docx

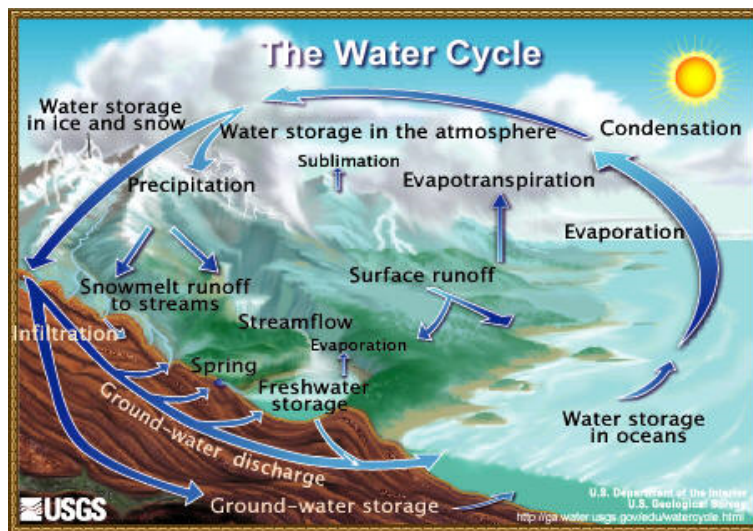
pg 114-121

water cycle incredible journey.docx



Answer questions  
- As you read  
fill in your  
Vocab sheet

[http://www.epa.gov/OGWDW/kids/flash/flash\\_water\\_cycle.html](http://www.epa.gov/OGWDW/kids/flash/flash_water_cycle.html)

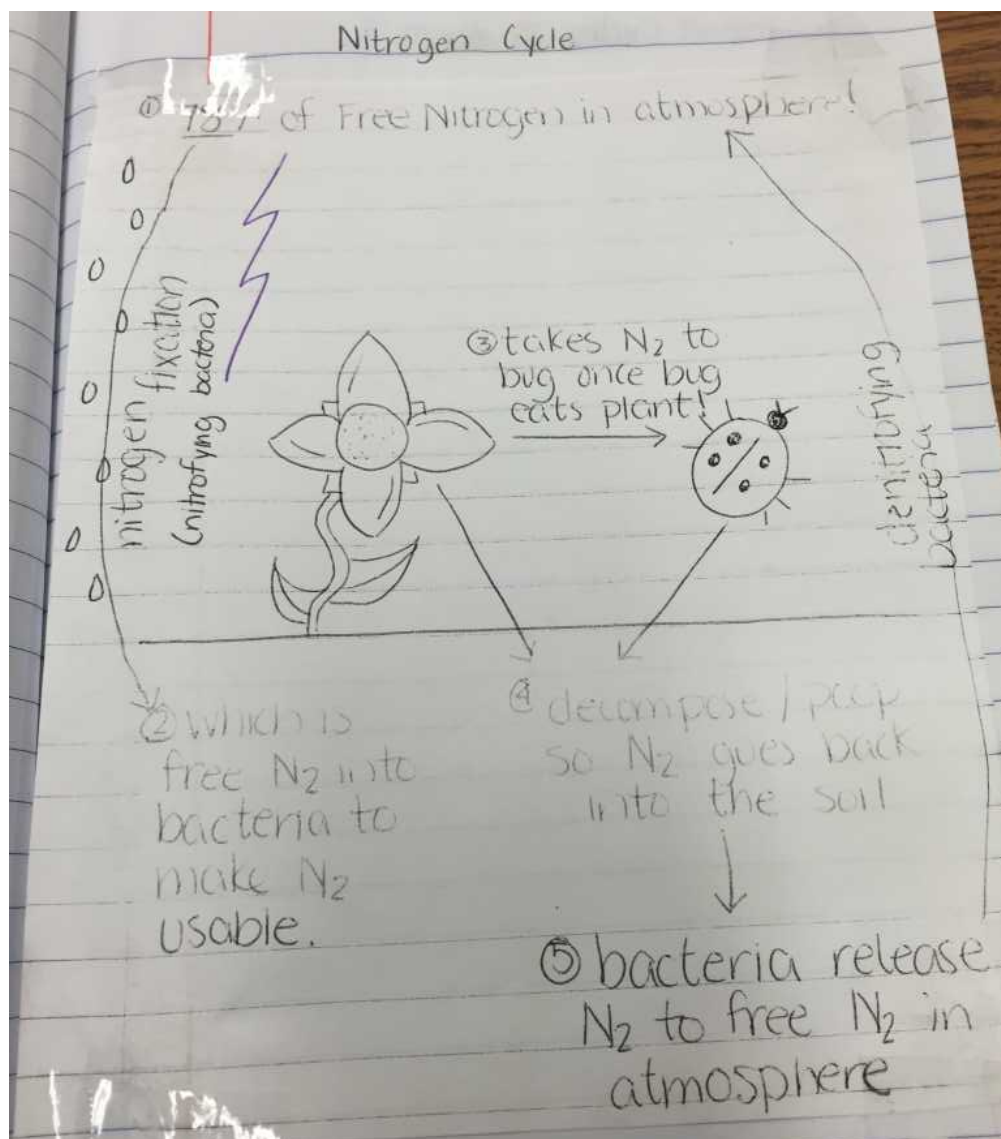


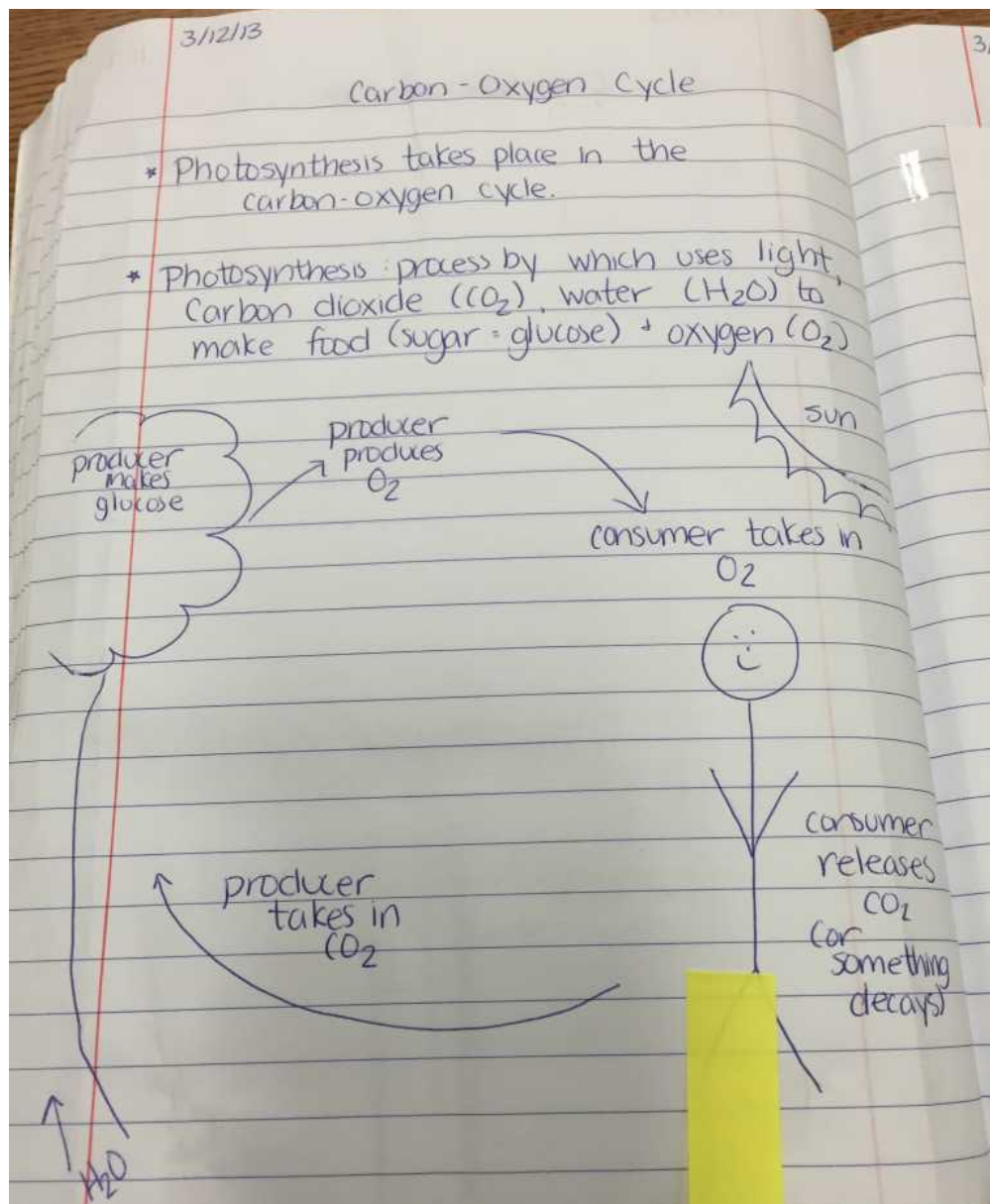
## Water Cycle



water cycle







## Evaporation:

- Evaporation is when the sun heats up water in rivers or lakes or the ocean and turns it into water vapor or steam. The water vapor or steam leaves the river, lake or ocean and goes into the air.



Credit: Kidzone Fun Facts



The measurement of the amount of water vapor in the air is humidity.

## Transpiration

- Do plants sweat?
- Well, sort of.... people perspire (sweat) and plants transpire.

Transpiration is the process by which plants lose water out of their leaves. Transpiration gives evaporation a bit of a hand in getting the water vapor back up into the air.

## Condensation:

-Water vapor in the air gets cold and changes back into liquid, forming clouds. This is called condensation.

- You can see the same sort of thing at home... pour a glass of cold water on a hot day and watch what happens. Water forms on the outside of the glass. That water didn't somehow leak through the glass! It actually came from the air. Water vapor in the warm air, turns back into liquid when it touches the cold glass.



## Precipitation:

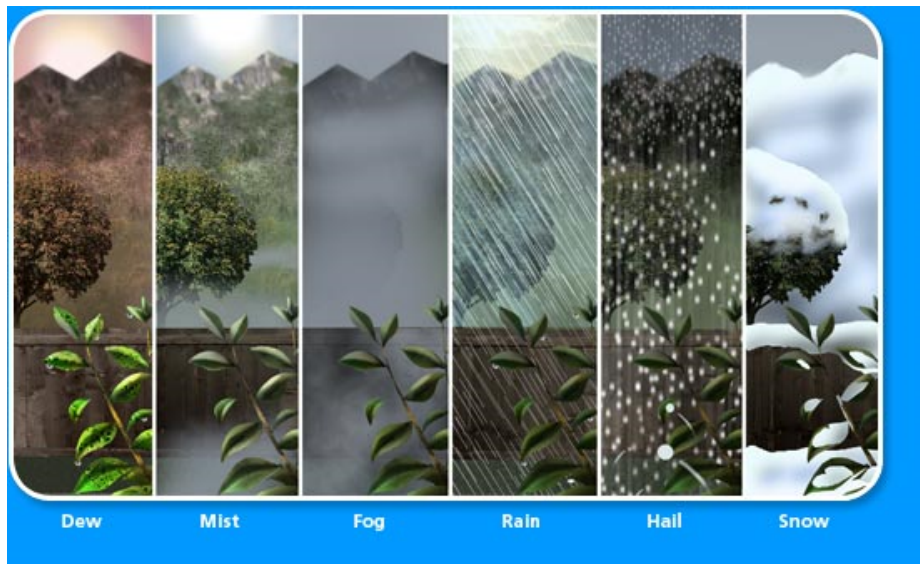
- Precipitation occurs when so much water has condensed that the air cannot hold it anymore. The clouds get heavy and water falls back to the earth in the form of rain, hail, sleet or snow.
- The amount of water vapor in the air is called humidity.





# *Types of Precipitation*

What determines the different types of precipitation?



<http://teacher.scholastic.com/activities/wwatch/sim/game.htm>

 precipitation conditions

## Collection:

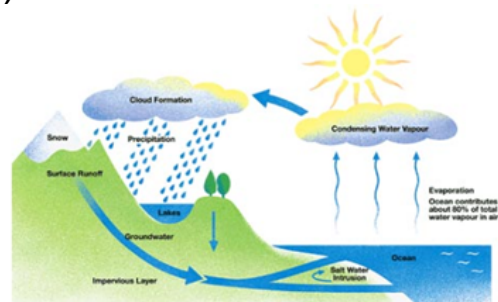


- When water falls back to earth as precipitation, it may fall back in the oceans, lakes or rivers or it may end up on land. When it ends up on land, it will either soak into the earth and become part of the “ground water” that plants and animals use to drink or it may run over the soil and collect in the oceans, lakes or rivers...

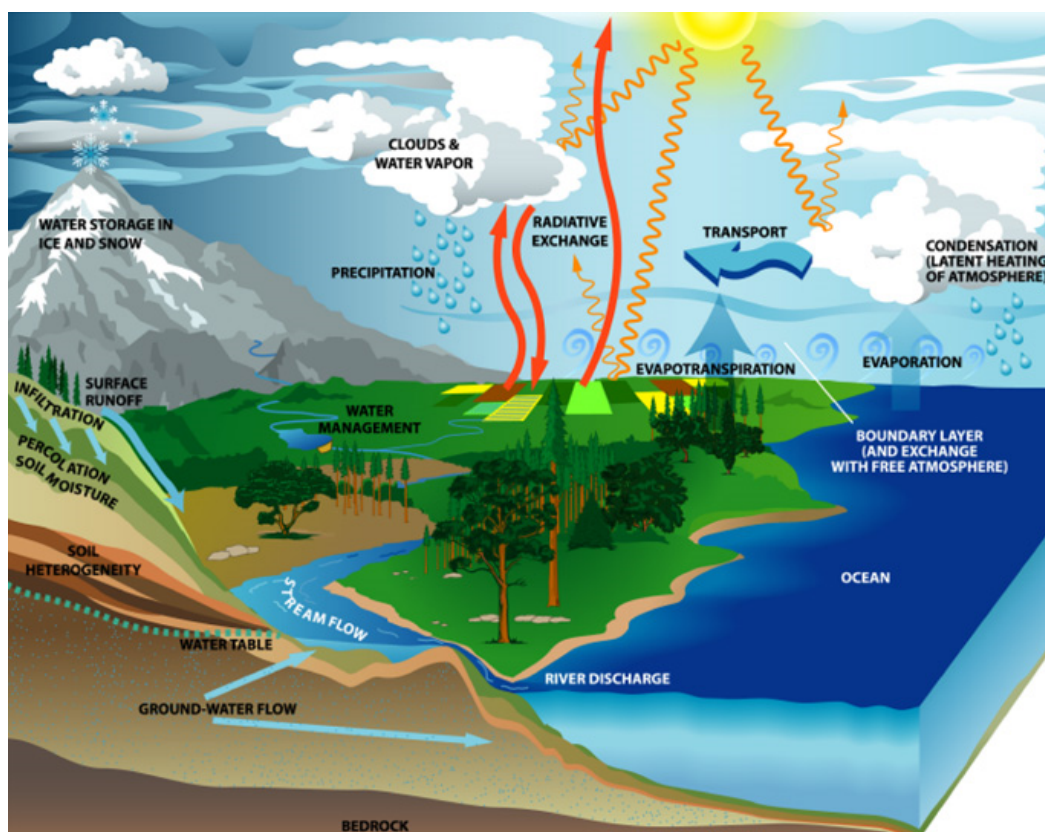
*...where the cycle starts all over again.*

# Let's review

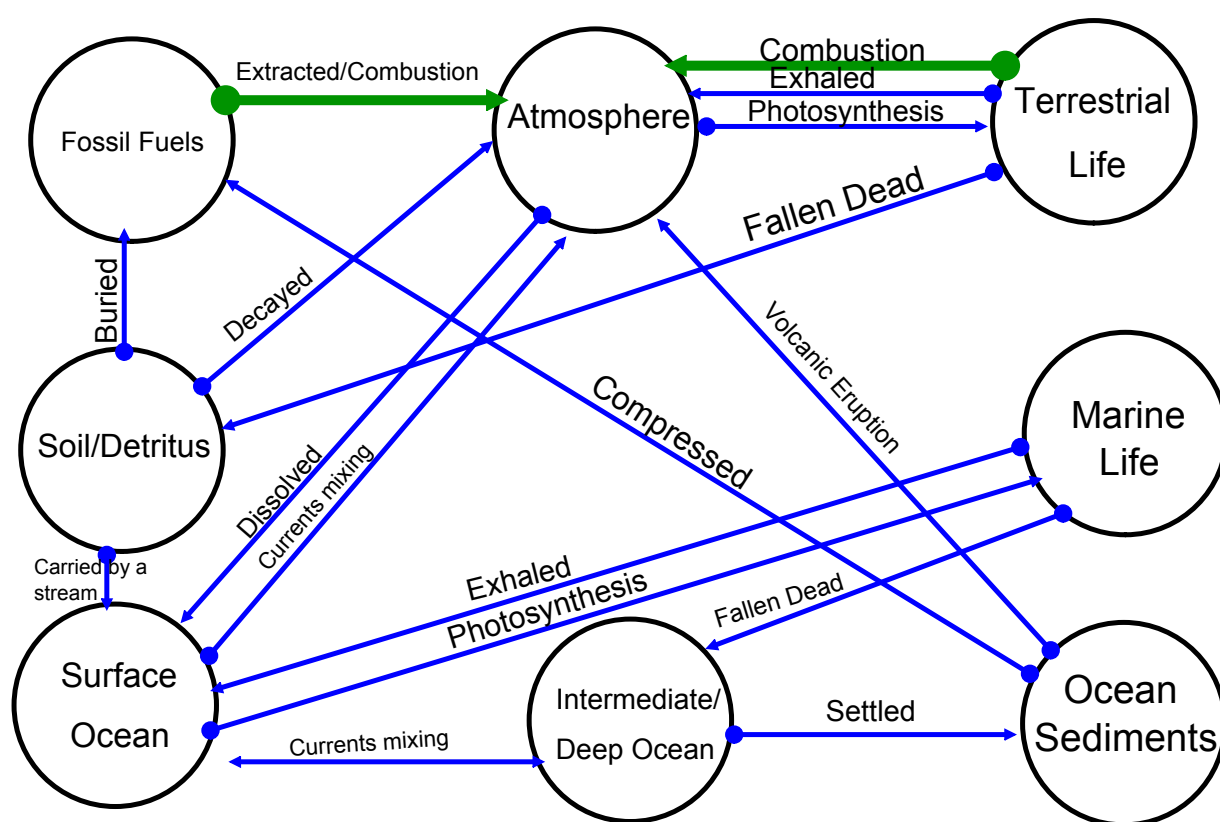
- The earth has a limited amount of water. That water keeps going around and around and around and around and (well, you get the idea) in what we call the "Water Cycle".
- This cycle is made up of a few main parts:
  - \* evaporation (and transpiration)
  - \* condensation
  - \* precipitation
  - \* collection



## Water in the Atmosphere



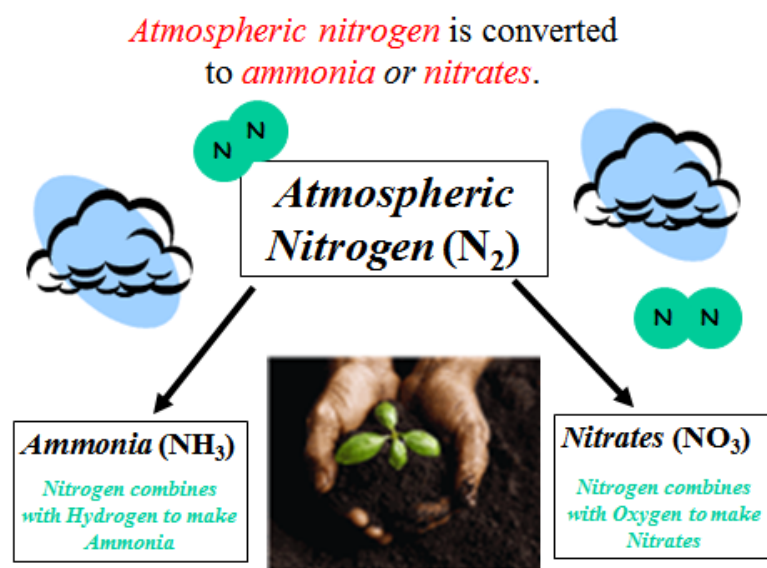
## Carbon and Oxygen Cycle





What happens to  
*atmospheric nitrogen*  
( $N_2$ ) in the nitrogen  
cycle?





## It is one of nature's great ironies...

*Nitrogen* is an essential component of DNA, RNA, and proteins—the building blocks of life.

Although the majority of the air we breathe is *nitrogen*, most living organisms are *unable to use nitrogen* as it exists in the *atmosphere*!





How does  
*atmospheric*  
*nitrogen* get  
changed into a  
form that can be  
used by most  
living organisms?



There are three ways that  
*nitrogen* gets “fixed”!

(a) *Atmospheric Fixation*



(b) *Industrial Fixation*

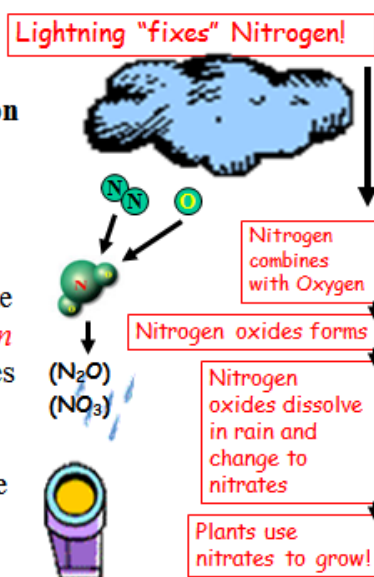
(c) *Biological Fixation*



*Bacteria*

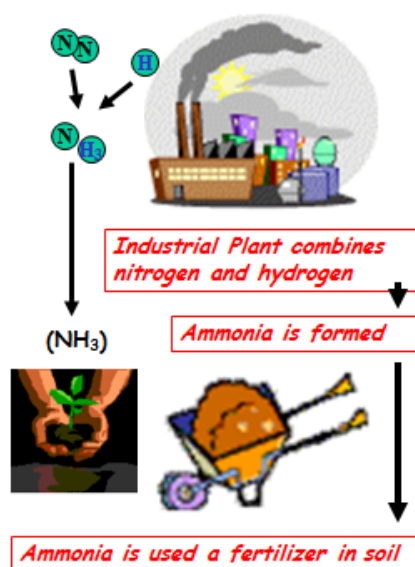
**Atmospheric Fixation**  
(Only 5 to 8% of the Fixation Process)

The enormous energy of *lightning breaks nitrogen molecules apart* and enables the nitrogen atoms to combine with oxygen forming *nitrogen oxides ( $N_2O$ )*. Nitrogen oxides dissolve in rain, forming nitrates. *Nitrates ( $NO_3$ )* are carried to the ground with the rain.



**Industrial Fixation**

Under great pressure, at a temperature of 600 degrees Celcius, and with the use of a catalyst, *atmospheric nitrogen ( $N_2$ )* and *hydrogen* are combined to form *ammonia ( $NH_3$ )*. Ammonia can be used as a *fertilizer*.



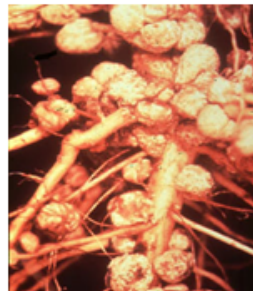
**Biological Fixation**

(where MOST nitrogen fixing is completed)

There are two types of "Nitrogen Fixing Bacteria"



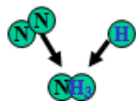
Free Living Bacteria  
("fixes" 30% of  $N_2$ )



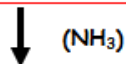
Symbiotic Relationship Bacteria  
("fixes" 70% of  $N_2$ )

### Free Living Bacteria

Highly specialized bacteria live in the soil and have the ability to combine *atmospheric nitrogen* with *hydrogen* to make *ammonia (NH<sub>3</sub>)*.



Free-living bacteria live in soil and combine atmospheric nitrogen with hydrogen



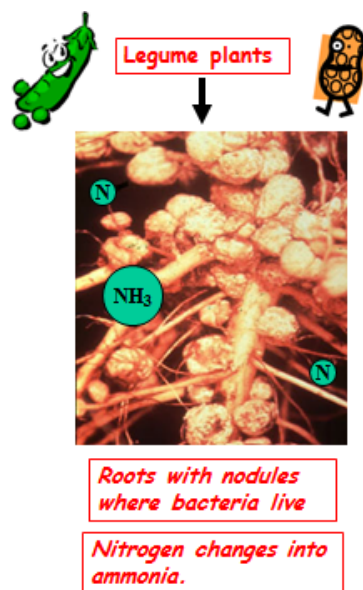
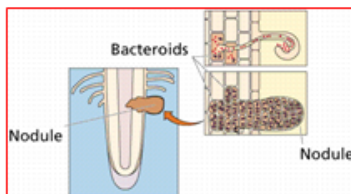
Nitrogen changes into ammonia



Bacteria

### Symbiotic Relationship Bacteria

Bacteria live in the roots of legume family plants and provide the plants with *ammonia* ( $\text{NH}_3$ ) in exchange for the plant's carbon and a protected home.



How does  
*nitrogen*  
reenter the  
*atmosphere*  
in the  
nitrogen  
cycle?

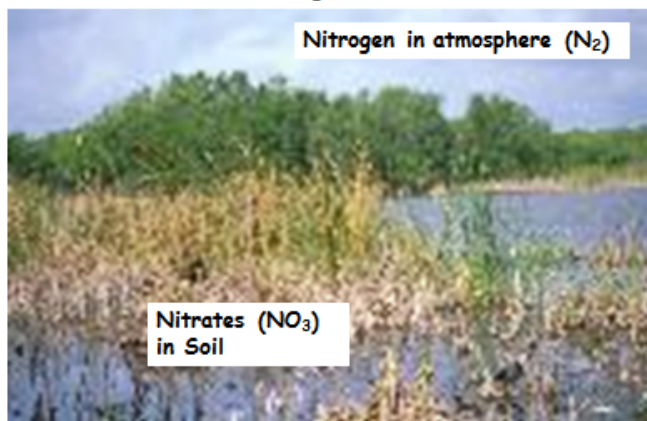




What does  
*denitrification*  
do?



*Denitrification* converts *nitrates* ( $\text{NO}_3$ ) in the soil to *atmospheric nitrogen* ( $\text{N}_2$ ) replenishing the atmosphere.



Denitrifying bacteria live deep in soil and in aquatic sediments where conditions make it difficult for them to get oxygen. The denitrifying bacteria use *nitrates* as an alternative to oxygen, leaving free *nitrogen gas* as a byproduct. They close the nitrogen cycle!




## Other ways that nitrogen returns to the atmosphere...




Emissions from industrial combustion and gasoline engines create nitrous oxides gas ( $\text{N}_2\text{O}$ ).



Volcano eruptions emit nitrous oxides gas ( $\text{N}_2\text{O}$ ).

 Nitrogen Cycle animated

 Nitrogen Cycle

## Attachments

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water cycle incredible journey.docx



Nitrogen Cycle animated



Nitrogen Cycle