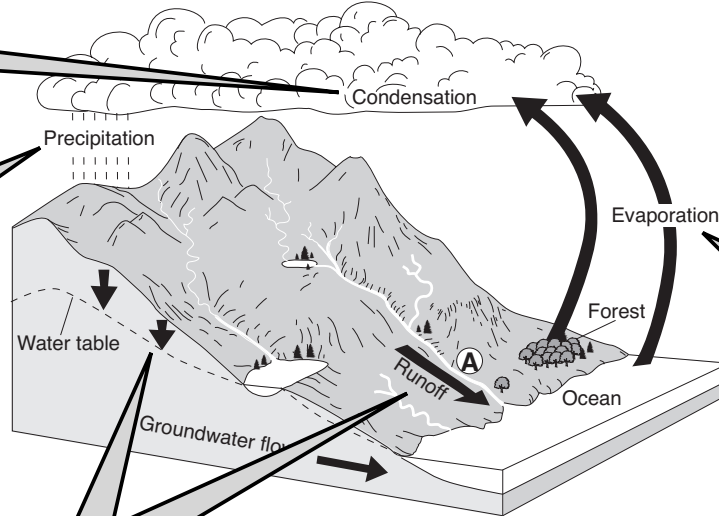


WEATHER (PART 2)

water vapor rises, cools and condenses into clouds

Precipitation occurs when cloud droplets combine and become too heavy to stay in the air

Water either infiltrates (sinks) into the ground or runs off the the surface



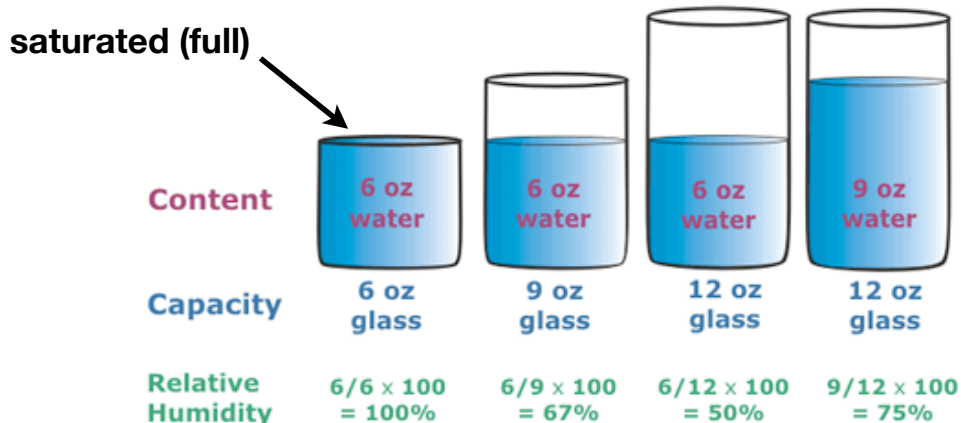
Evaporation and Transpiration (from plants) add water vapor to the air

Factors causing more Evaporation

- More surface area
- Higher temperature
- More wind or faster wind speed
- Less dissolved salts
- More covering over the water

Humidity	The amount of moisture in the air (but NOT liquid water like clouds and rain)
Absolute Humidity	Actual amount of water in the air (EX: 50 grams/cubic meter)
Relative Humidity	Amount of moisture compared to capacity
Capacity	Maximum amount of water that can be held by the air

Think of capacity like the size of the glass

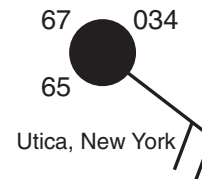


When Relative humidity reaches 100% water vapor condenses (creates clouds)

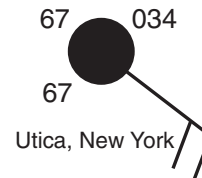
The air's capacity to hold water decreases as temperature decreases
(in our analogy: the glass gets smaller)

If the air cools to a point where the capacity is less than the amount of water in the air, condensation occurs, this point is called the **dewpoint**
(the glass overflows)

If the Temperature is close to the Dewpoint, Relative Humidity is high



If the Temperature is equal to the Dewpoint, Relative Humidity is 100%

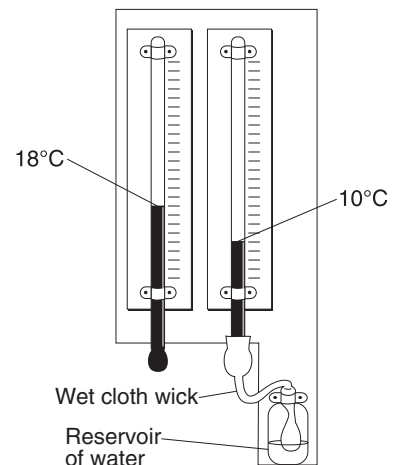


If the Dewpoint is low it usually means moisture in the air is low as well

To find Dewpoint temperature, use a sling psychrometer and the chart below

Dry Bulb = 18°C and Difference = 18°C-10°C = 8°C

Dewpoint (°C)																
Dry-Bulb Temperature (°C)	Difference Between Wet-Bulb and Dry-Bulb Temperatures (°C)															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
-20	-20	-33														
-18	-18	-28														
-16	-16	-24														
-14	-14	-21	-36													
-12	-12	-18	-28													
-10	-10	-14	-22													
-8	-8	-12	-18	-29												
-6	-6	-10	-14	-22												
-4	-4	-7	-12	-17	-29											
-2	-2	-5	-8	-13	-20											
0	0	-3	-6	-9	-15	-24										
2	2	-1	-3	-6	-11	-17										
4	4	1	-1	-4	-7	-11	-19									
6	6	4	1	-1	-4	-7	-13	-21								
8	8	6	3	1	-2	-5	-9	-14								
10	10	8	6	4	1	-2	-5	-9	-14	-28						
12	12	10	8	6	4	1	-2	-5	-9	-16						
14	14	12	11	9	6	4	1	-2	-5	-10	-17					
16	16	14	13	11	9	7	4	1	1	-6	-10	-17				
18	18	16	15	13	11	9	7	4	2	-2	-5	-10	-19			
20	20	19	17	15	14	12	10	7	4	2	-2	-5	-10	-19		
22	22	21	19	17	16	14	12	10	8	5	3	-1	-5	-10	-19	
24	24	23	21	20	18	16	14	12	10	8	6	2	-1	-5	-10	-18
26	26	25	23	22	20	18	17	15	13	11	9	6	3	0	-4	-9
28	28	27	25	24	22	21	19	17	16	14	11	9	7	4	1	-3
30	30	29	27	26	24	23	21	19	18	16	14	12	10	8	5	1

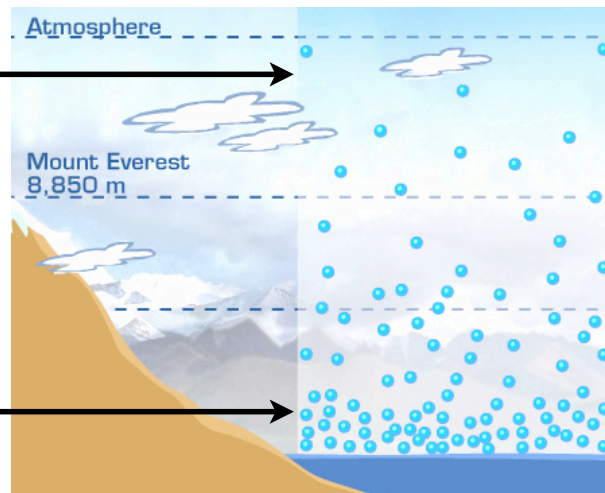


Do the same exact thing to find the Relative Humidity using the and the Relative Humidity chart

Air pressure is caused by the weight of the air pushing down

Air pressure is
least at high
altitudes

Air pressure is
greatest at low
altitudes



less air molecules,
less weight

High pressure

Cool, dry air is more dense

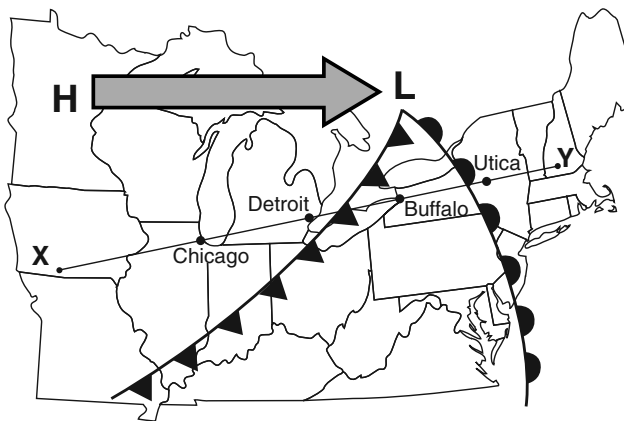
Low pressure

Warm, moist air is less dense

Low air pressure = Lousy weather (stormy, rainy, cloudy)

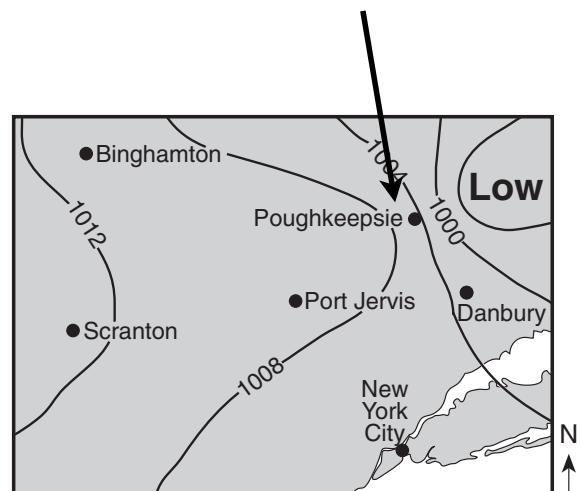
Wind is caused by uneven heating causes density differences

wind moves from **HIGH** to **LOW** pressure

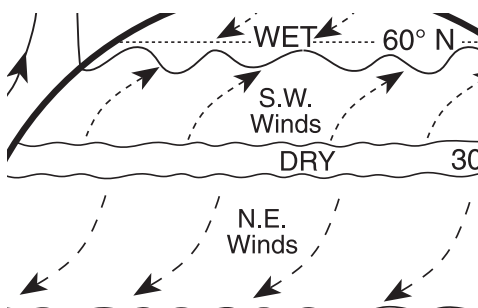


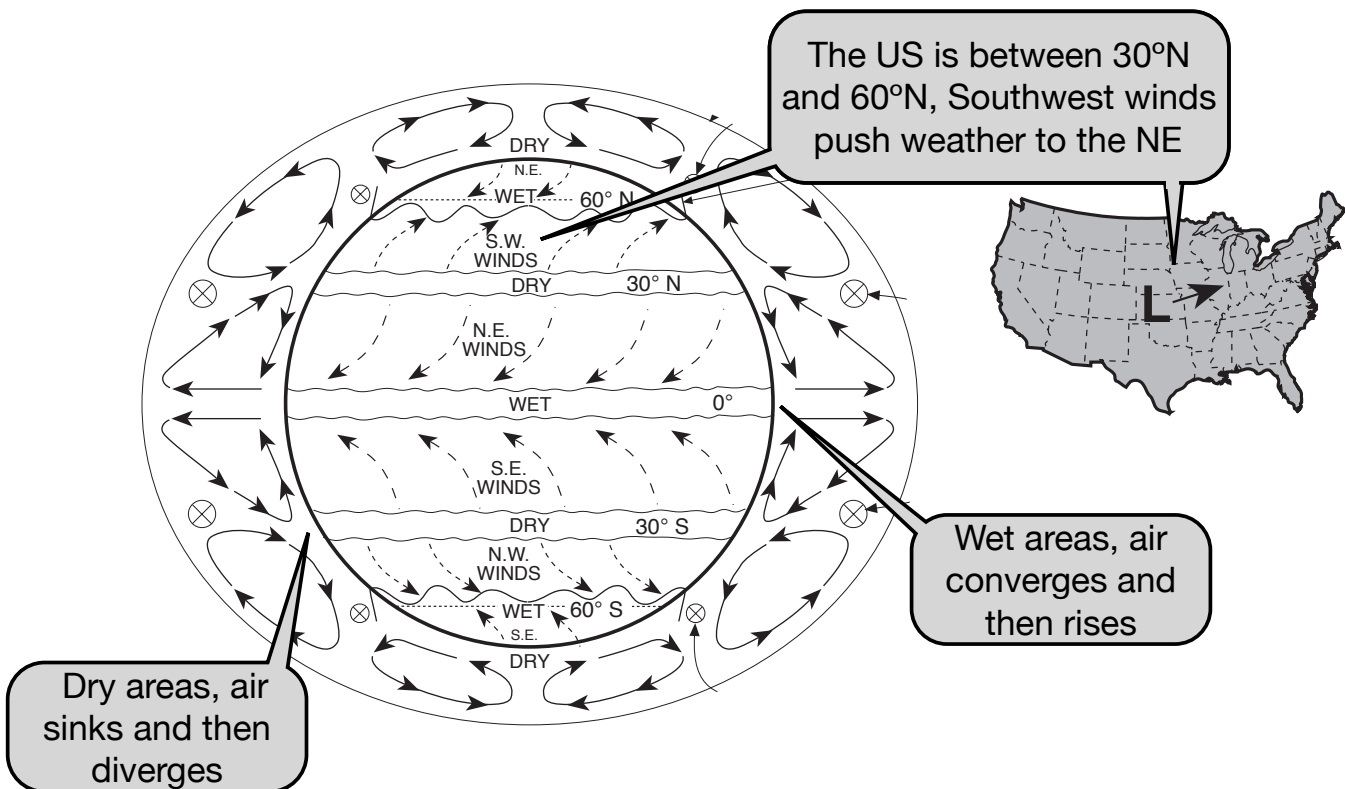
wind is fastest when the pressure
gradient is greatest

On a map, wind is fastest when
isobars are closest together



winds curve to the right in the (N. Hemisphere)
due to the Coriolis effect

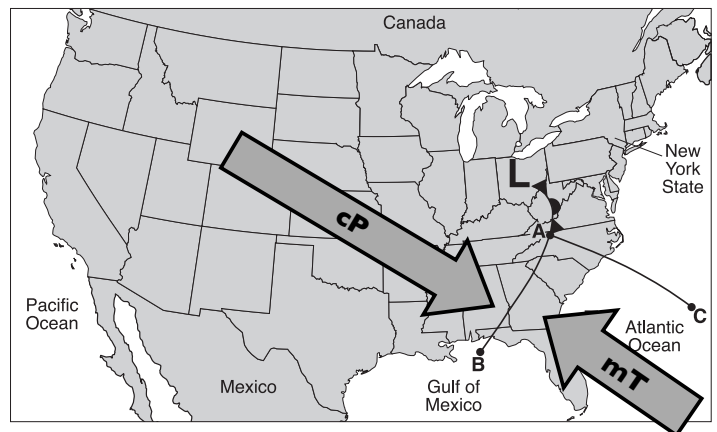




Air masses get their properties from the areas they pass over

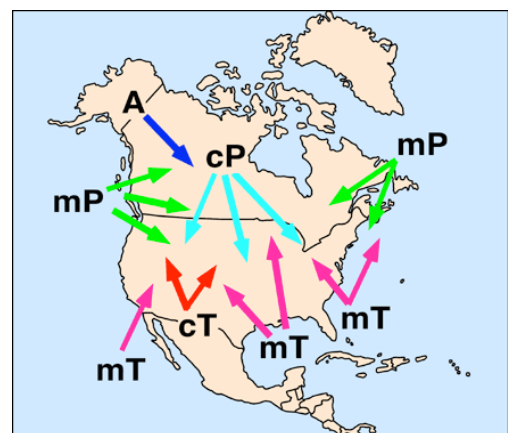
Moisture

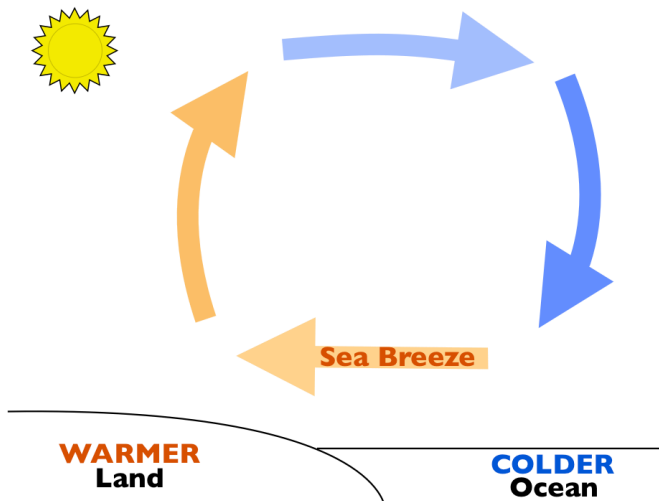
winds coming from water are moist and are indicated with a “m” for **maritime**
winds coming from land are dry and are indicated with a “c” for **continental**



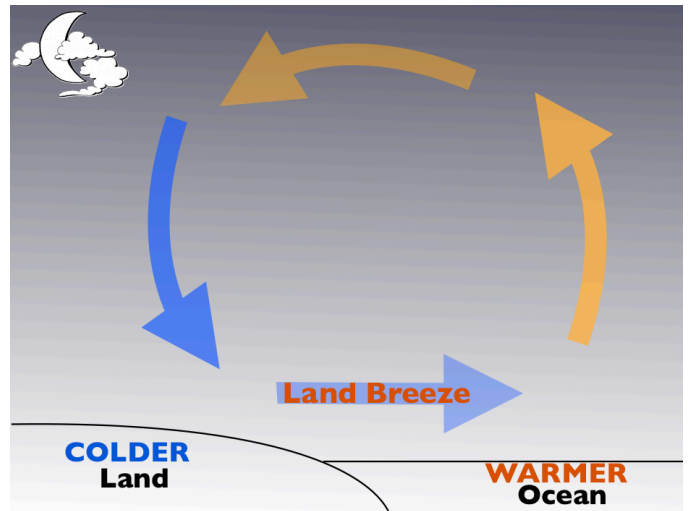
Temperature

winds coming from the north are cold and are indicated with a “P” for **Polar**
winds coming from the south are warm and are indicated with a “T” for **Tropical**
winds coming from very north are very cold and are indicated with an “A” for **Arctic**



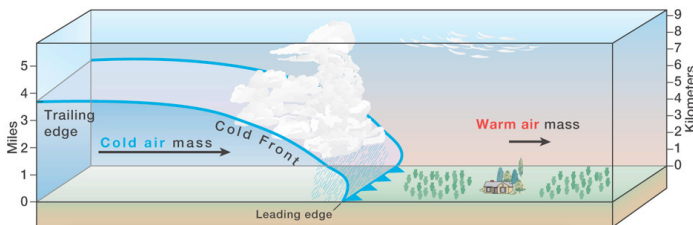


Land (low specific heat) warms up faster during the day



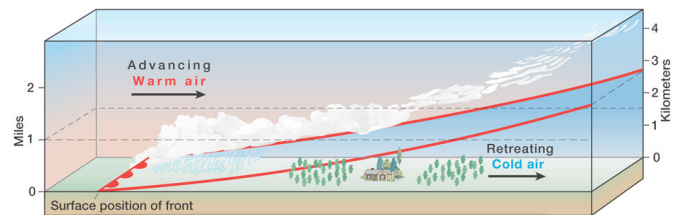
Land (low specific heat) cools down faster at night

At all fronts, warm air rises



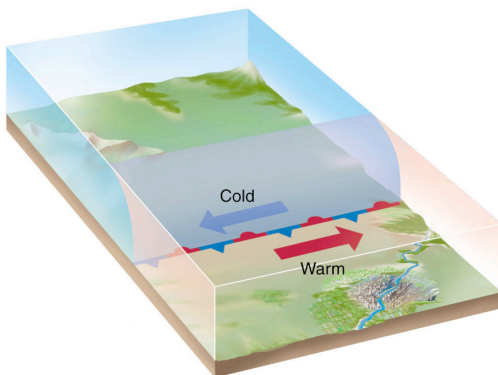
Cold Front

Cold air overtakes warm air



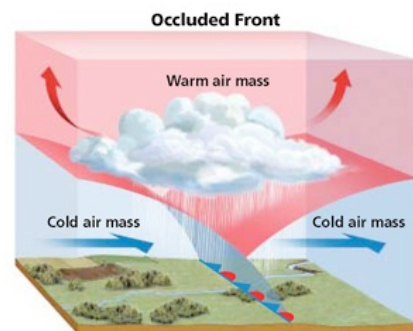
Warm Front

Warm air overtakes cold air



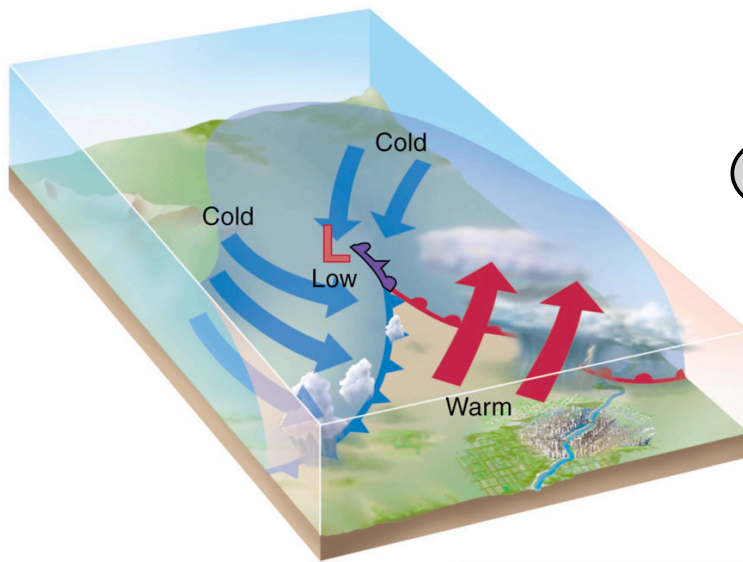
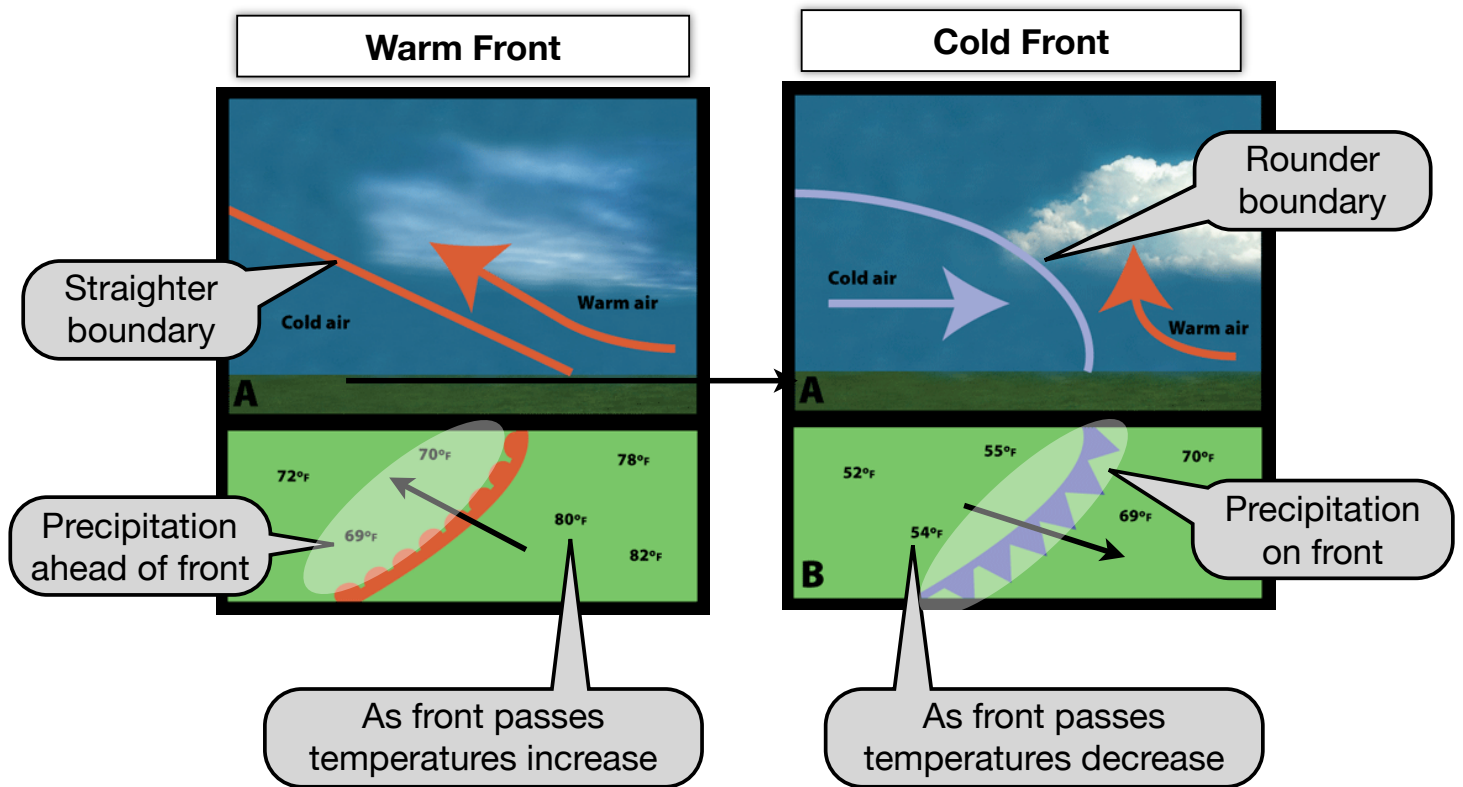
Stationary Front

Cold Air and Warm Air slide by each other

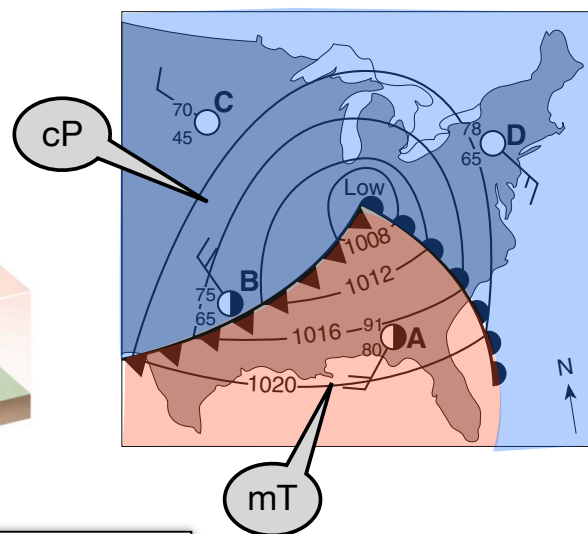


Occluded Front

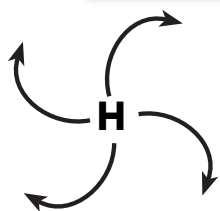
Cold and Warm fronts combine



Midlatitude Cyclone

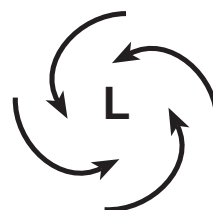


High Pressure system



- Cold and dry
- Clockwise
- Away from center
- Air sinks

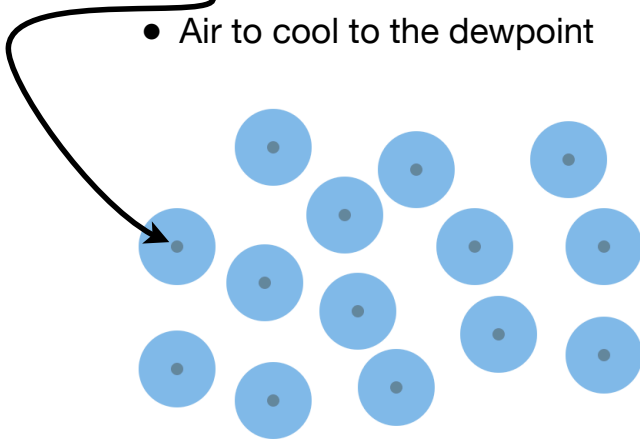
Low Pressure system



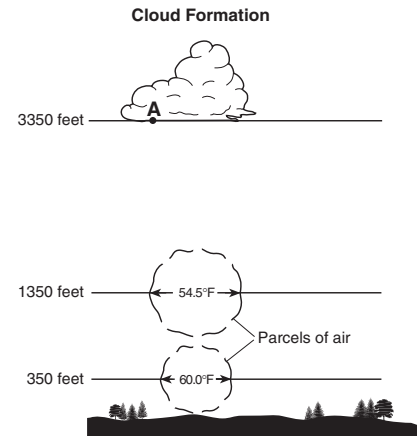
- Warm and moist
- Counterclockwise
- Towards center
- Air rises

Cloud formation requires two conditions:

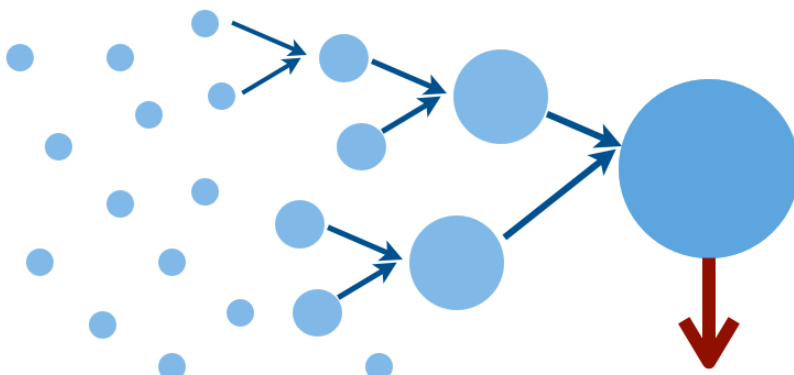
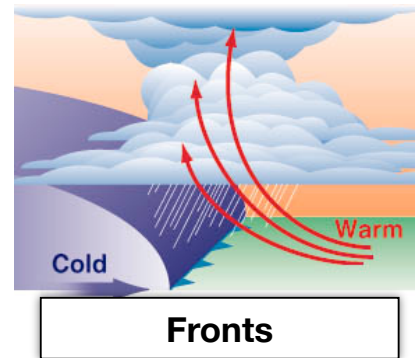
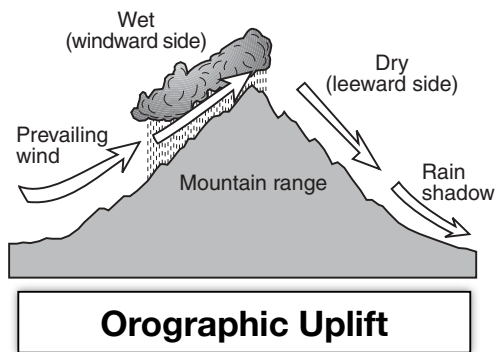
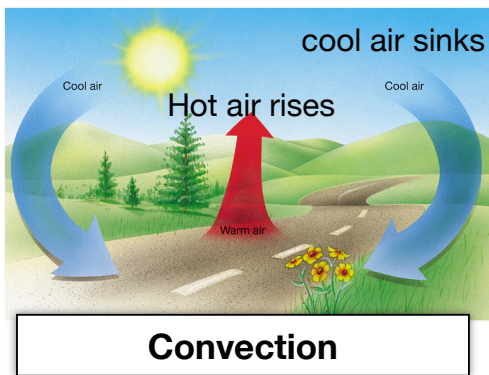
- Condensation nuclei
- Air to cool to the dewpoint



To cool to the dewpoint, air must rise



Air can rise 3 ways:



If enough condensation occurs clouds droplets collide and merge until they become heavy enough and fall in the form of precipitation

Hail, rain, drizzle, snow and Sleet are precipitation

Fog, dew and clouds are not precipitation