

The interaction of Air, Water and the Sun result in the weather.

The Water Cycle forms the basis of our weather.



Humidity is the amount of water held in the air.

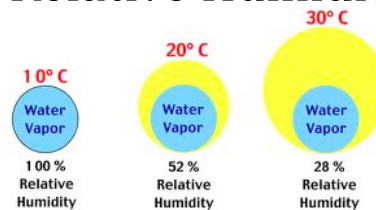
Humidity is the amount of water held in the air.

The warmer the temperature, the higher the water vapor thus higher the humidity.



Air at higher temperatures can hold more water vapor than air at lower temperatures

Relative Humidity



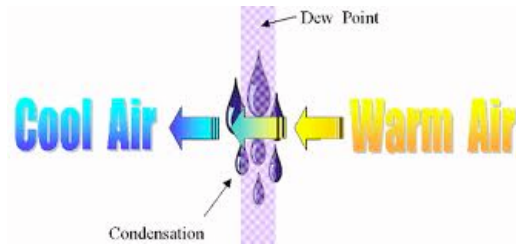
The measure of the amount of water vapor in the air compared to the amount that could be in the air at a specific temperature.

When air holds all the water vapor it possibly can, we say its saturated.



What is dew point?

The temperature at which air is saturated with water and condensation begins.



If air containing moisture is cooled, the temperature at which the vapor is condenses is known as the dew point.

Water can form on surfaces at night when the air is clear because the air near the ground has cooled to the dew point.



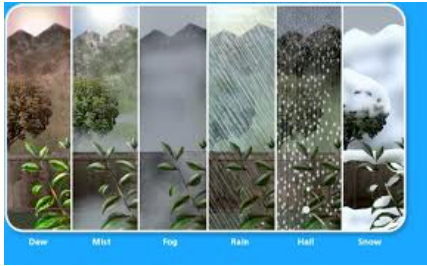
What is the difference between fog and dew?

Fog is a stratus cloud that forms on or near the ground. For fog to form, air near the ground must cool to its dew point. When the temperature cools, the air condenses and forms fog.



What is precipitation?

When water droplets form around dust particles and becomes heavy enough to falls out of the clouds, we experience precipitation.



4 Main Types of Precipitation

Precipitation rain that comes in all different forms depending on the temperature of the atmosphere by = g and q ! ☺



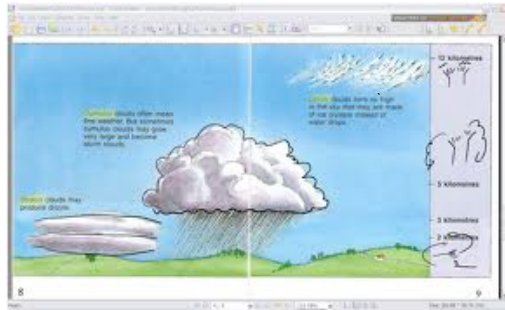
Snow that melts in the air and then refreezes near the ground becomes sleet.



Hail is a lump of ice that forms in thunderstorm cumulonimbus clouds. They are tossed up and down gaining several layers.



The three main types of clouds are stratus, cumulus and cirrus



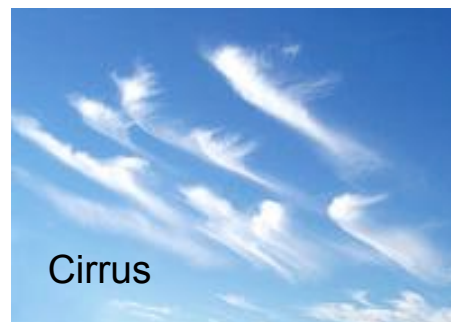
Low, layered gray clouds that produce light precipitate are stratus clouds



Thick, puffy clouds are called cumulus clouds.

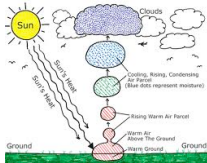


High (the highest), white, feathery clouds usually associated with fair weather are cirrus clouds.



Describe how clouds form.

Warm air is forced upwards, expands and cools. The cool air condenses as water vapor gathers around dust, smoke or salt. These droplets gather to form clouds.

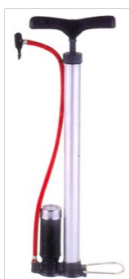


Three things are required for clouds to form:

- **Water vapor in the air**
- **Condensation nuclei**
- **A cooling process**

Adiabatic cooling forms clouds.

Adiabatic Warming and Cooling
Example: Bicycle Pump



Compress the air in the pump and the air warms
Adiabatic warming

Release the air from the nozzle, it expands, and cools
Adiabatic cooling

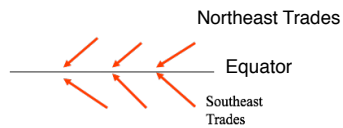
Four naturally occurring mechanisms on Earth cause air to rise:

- Orographic lifting**
- Frontal wedging**
- Convergence**
- Localized convective lifting**

Convergence Lifting



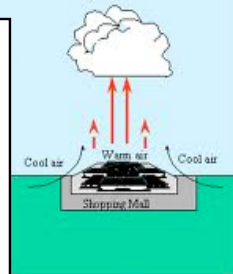
- *Air masses converge
- *Air forced upwards
- *Common near Equator



Convective Precipitation

Convective Precipitation

Unequal heating at the earth's surface creates a local hot spot. Air in contact with the hot spot expands and rises. Rising air cools adiabatically to dew point temperature.



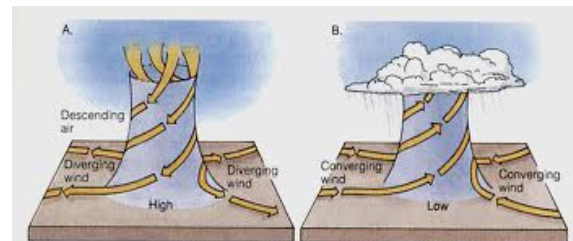
Define air mass.

Air mass is a large body of air that has the same properties as the surface over which it develops.

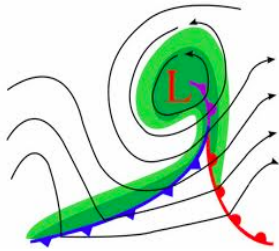


Low Pressure: air rises and forms clouds as it cools. Cloudy days are associated with low pressure.

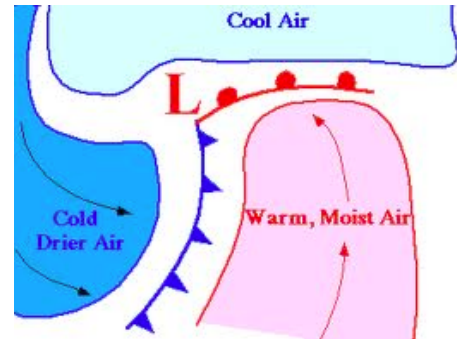
High pressure: air sinks/descends so air can't rise and there are few clouds.



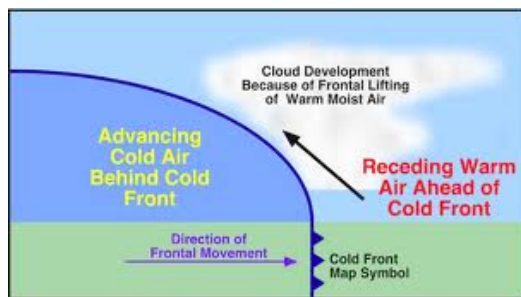
One place where low pressure systems form is along fronts.



A front forms when two air masses meet.



Thunderstorm generally form along a cold front.



Tornadoes are usually associated with thunderstorms



Tornadoes are a violent, whirling wind that moves over a narrow path on land.



Lightning results from clouds having different electrical charges.



Hurricanes form over tropical oceans.



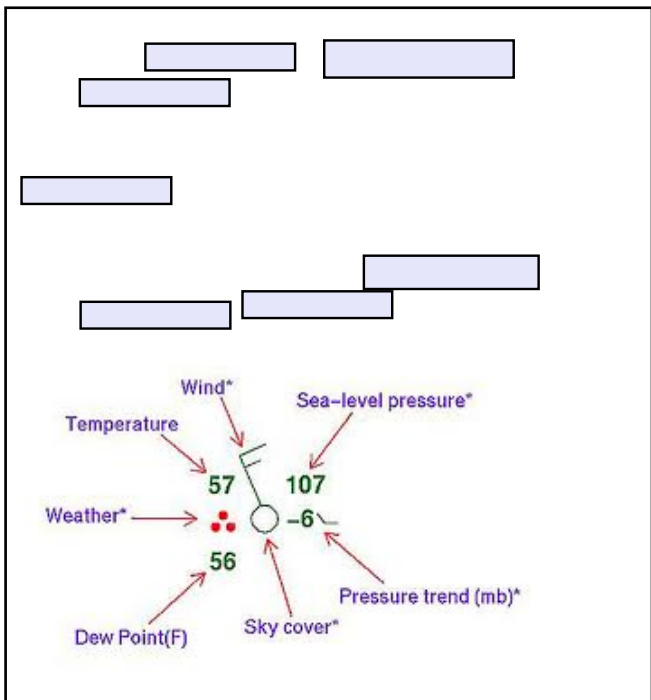
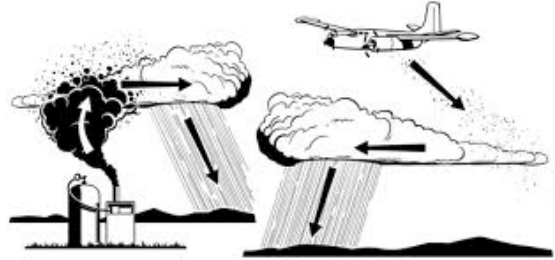
A isotherm connects points of equal temperature with a line



A meteorologist forecast the weather using data collected from many sources



Throughout the years, a number of cloud-seeding experiments have been unsuccessful because conditions that affect weather vary so much



Types of Fronts

