

WEATHER PROPERTIES

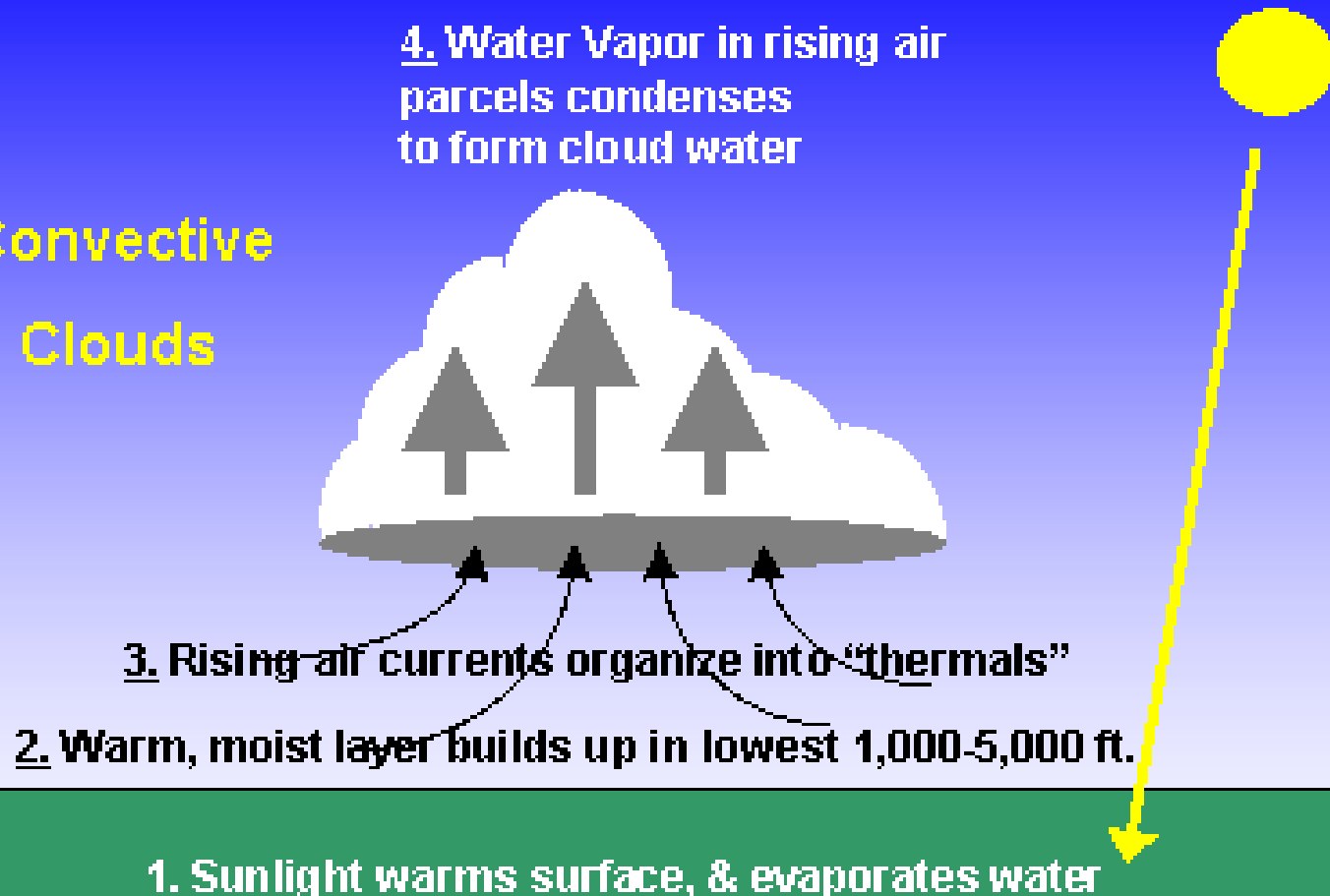
Objective: I can describe the different weather properties of fronts, air masses, pressure systems, clouds, and severe weather

Weather Properties

- ▣ Clouds
- ▣ Air Masses
- ▣ Pressure Systems
- ▣ Fronts
- ▣ Storms

Cloud Formation

Convective Clouds



Cirrus

- ▣ Thin, wispy clouds
- ▣ Composed of ice crystals
- ▣ Typically located high in the atmosphere



Cirrus clouds with fog rolling in

Cumulus

- ▣ The “typical” cloud
- ▣ White and puffy
- ▣ Associated with fair weather in mid to low altitudes



-- Photograph by Ronald L. Holle --
-- U. of Illinois Cloud Catalog --

Stratus



- ▣ Flat appearing clouds
- ▣ Often form a blanket covering all or most of the sky

Nimbus



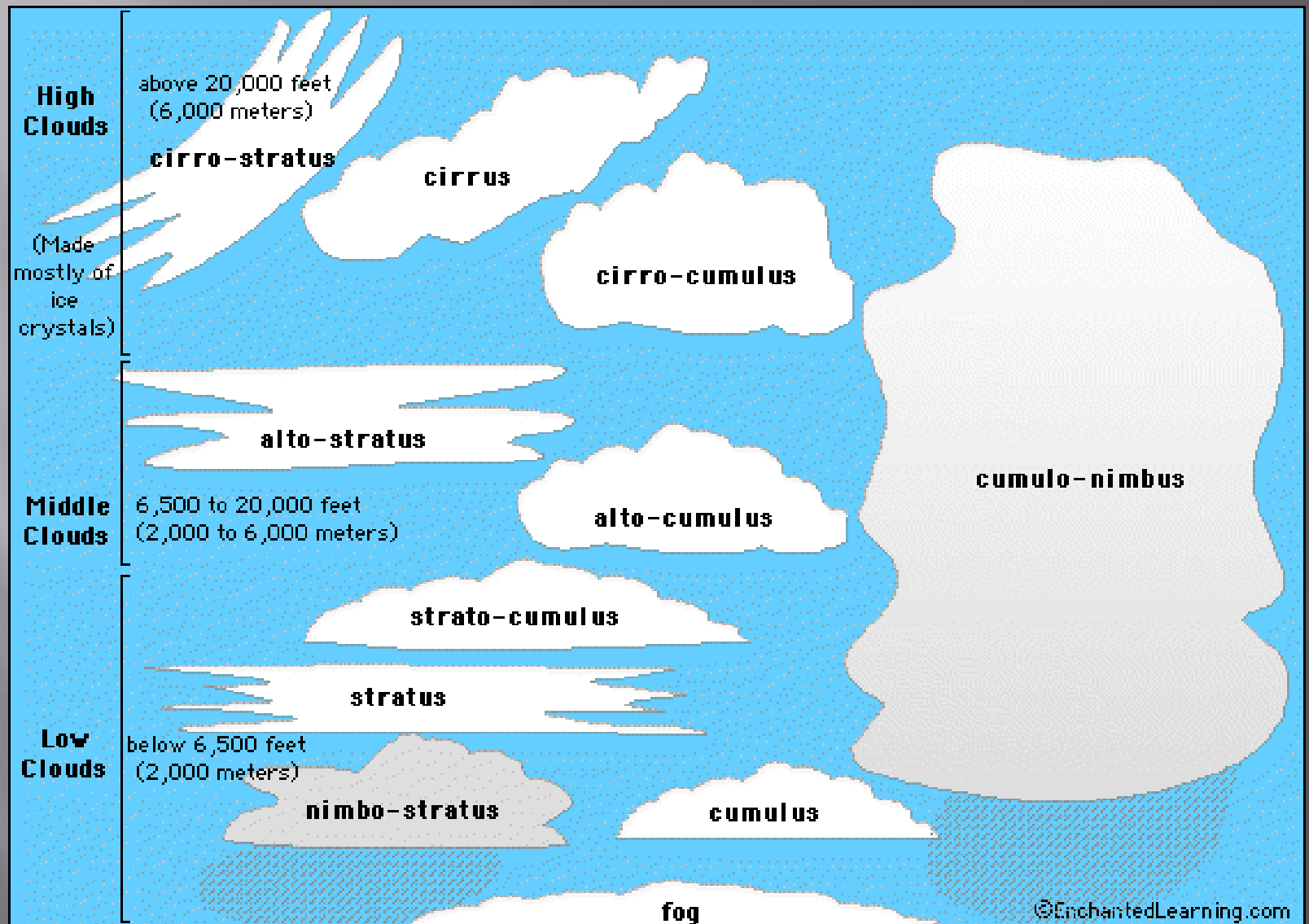
- ▣ Nimbus = rain producing
- ▣ Often appear grey in color

Alto: High in the Sky



- ▣ Alto = High
- ▣ Altocumulus or altostratus

Cloud Classifications



Air Masses, Fronts, and Pressure Systems

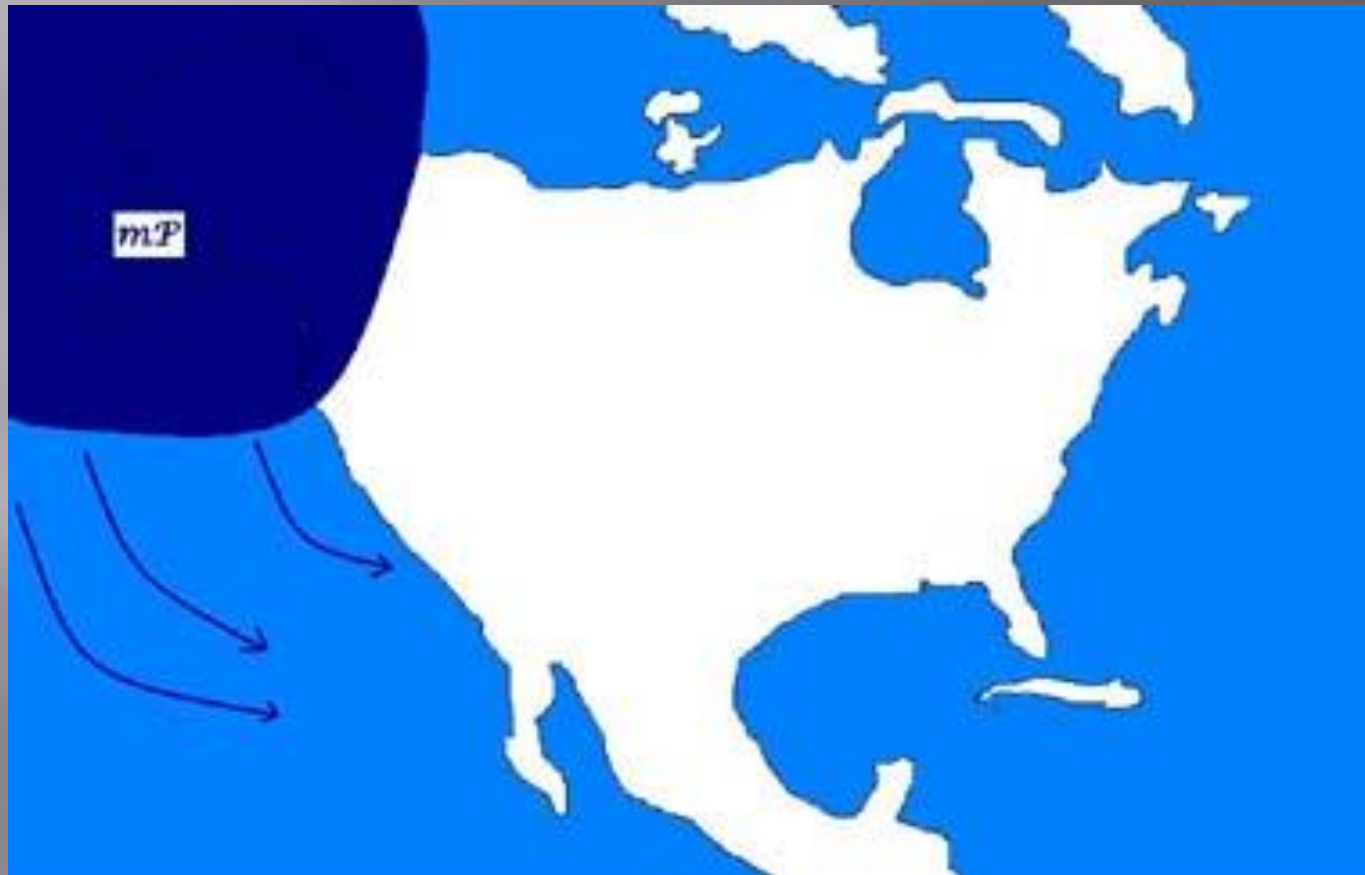
Air Masses

Air Mass- A huge body of air that has similar temperature, humidity and air pressure.

4 types of air

- ▣ Polar- cold
- ▣ Tropical- warm
- ▣ Maritime- moist
- ▣ Continental- dry

Maritime Polar



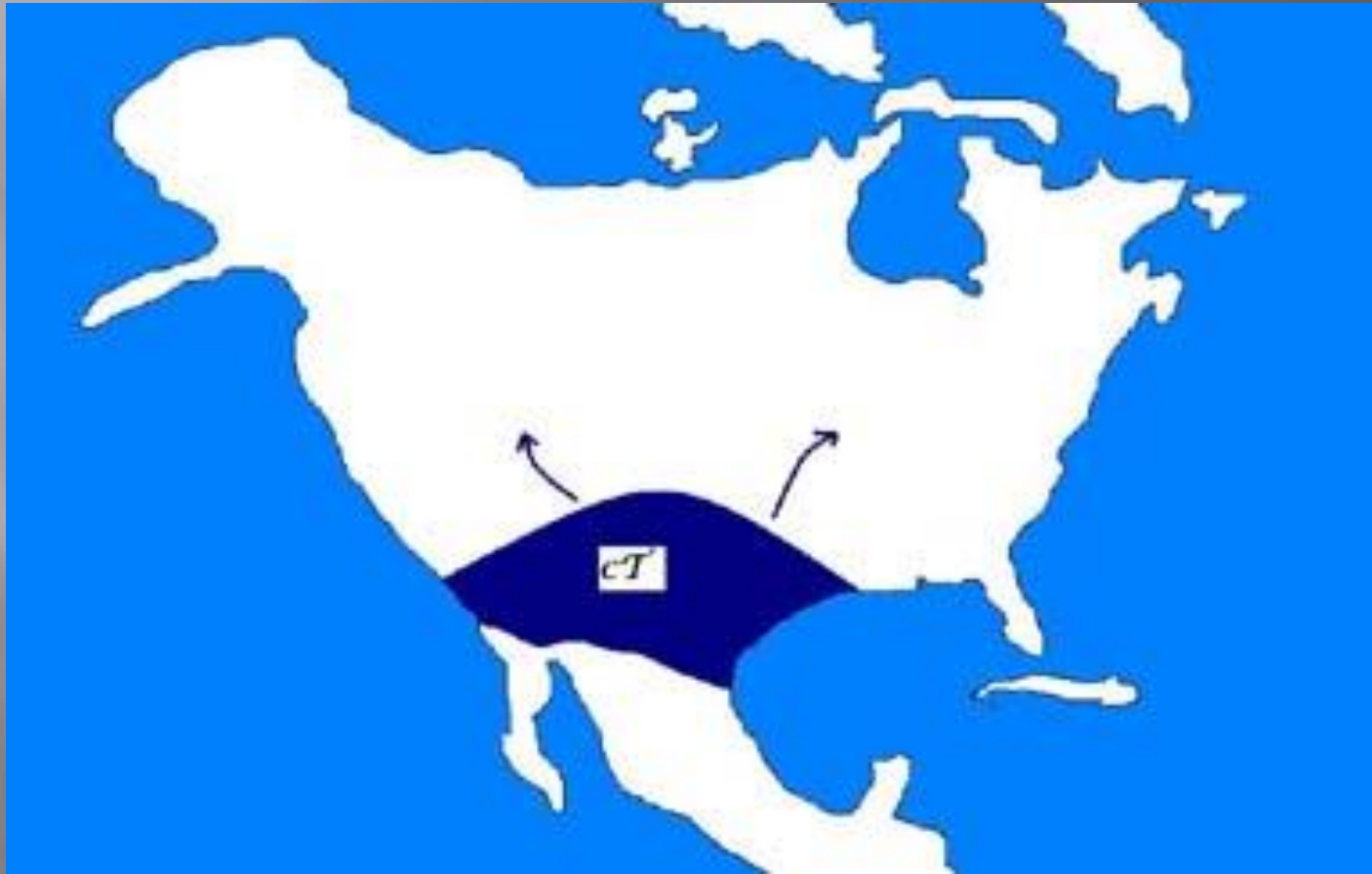
Maritime Tropical



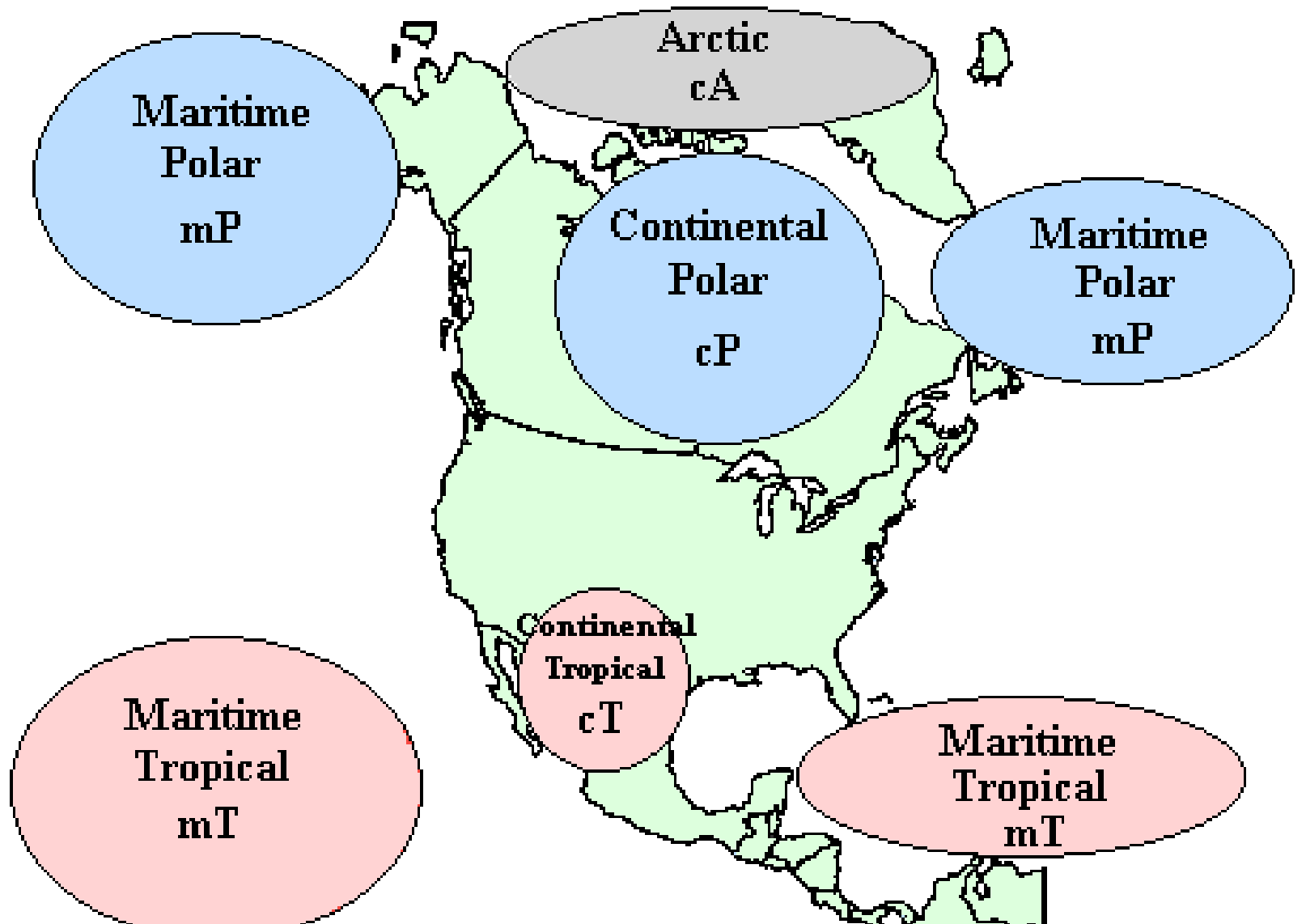
Continental Polar



Continental Tropical



North American Air Mass Source Regions



Fronts

Front- A boundary where two air masses meet

4 types of fronts

Cold Front

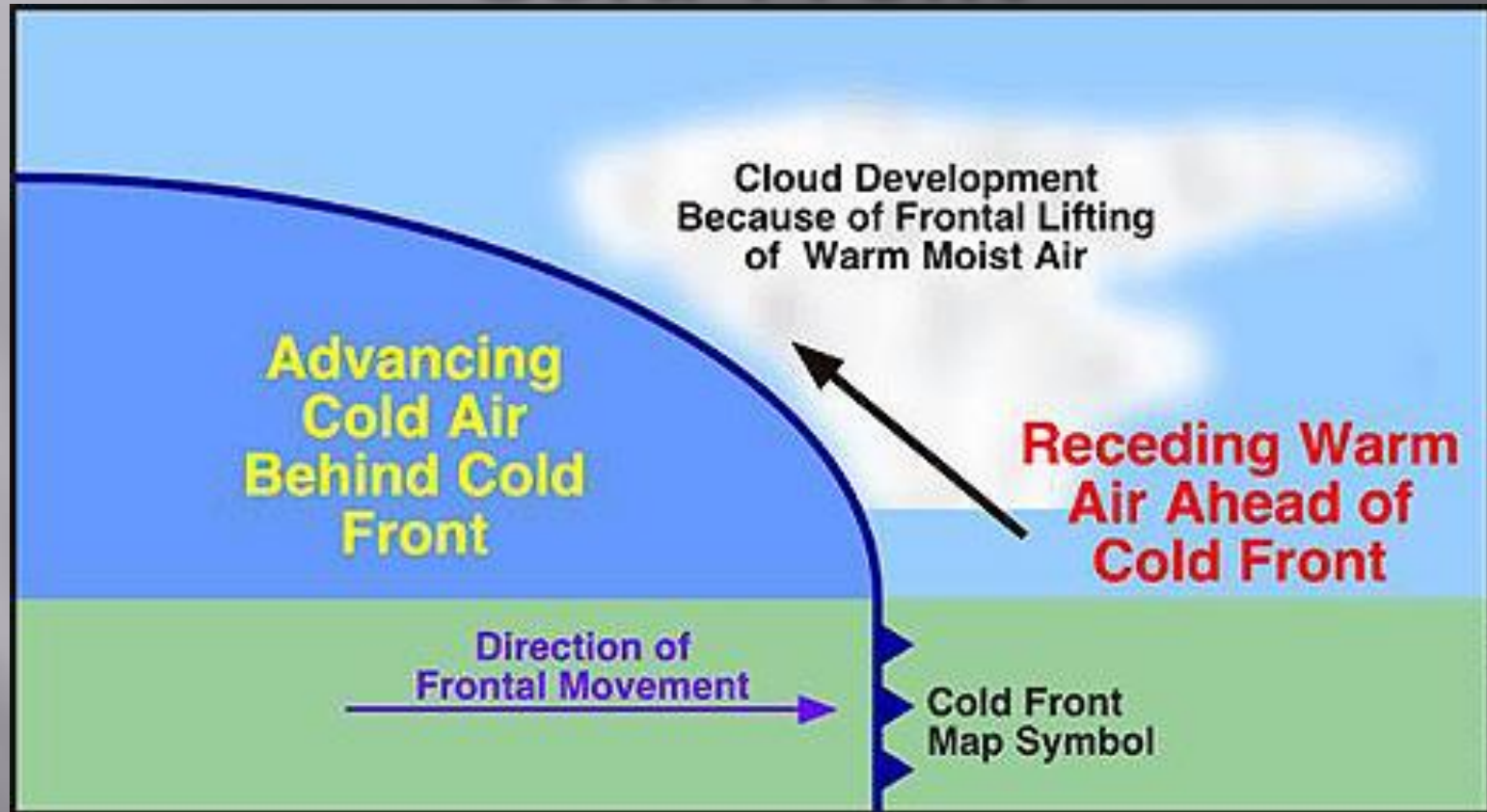
Warm Front

Stationary Front

Occluded Front

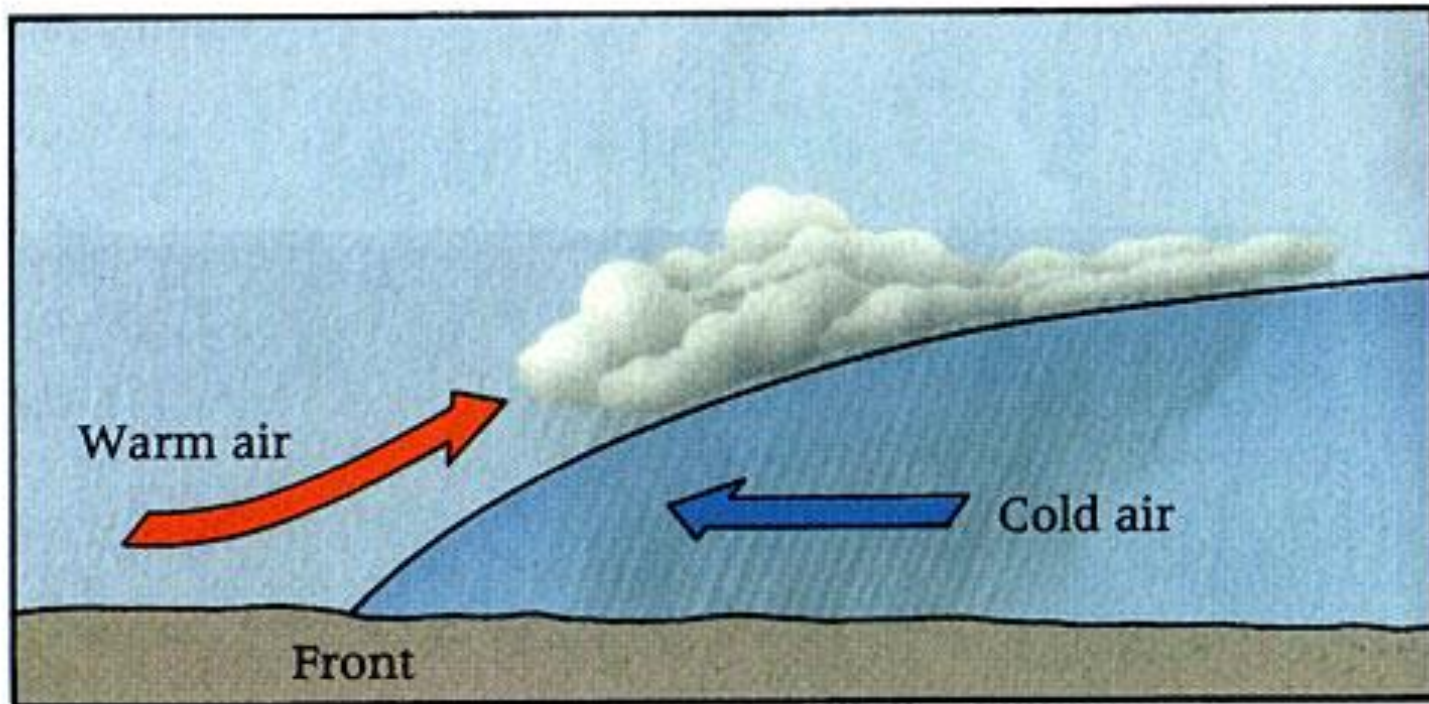


Cold Front



Move quickly and cause fast weather changes. Rainfall Depends on the warm air mass ahead of it. What if the warm air mass contains little water vapor?

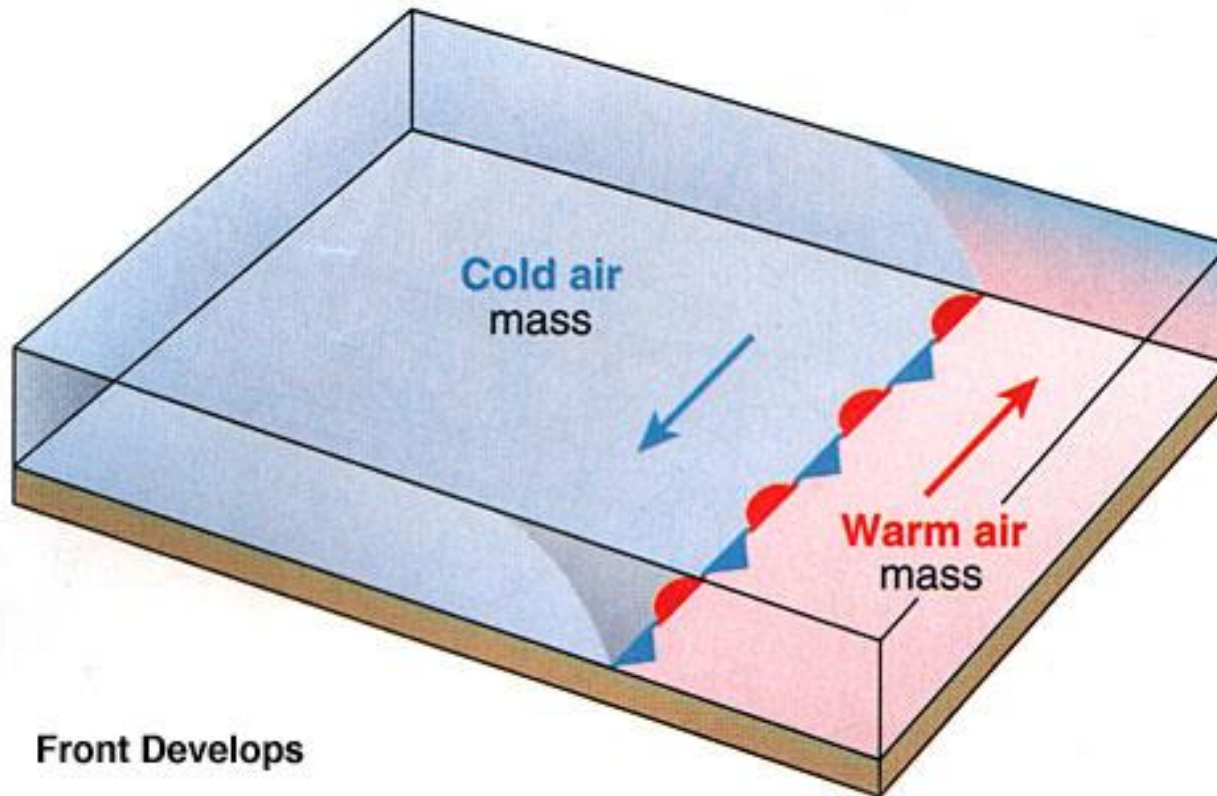
Warm Front



Cyclonic (frontal)

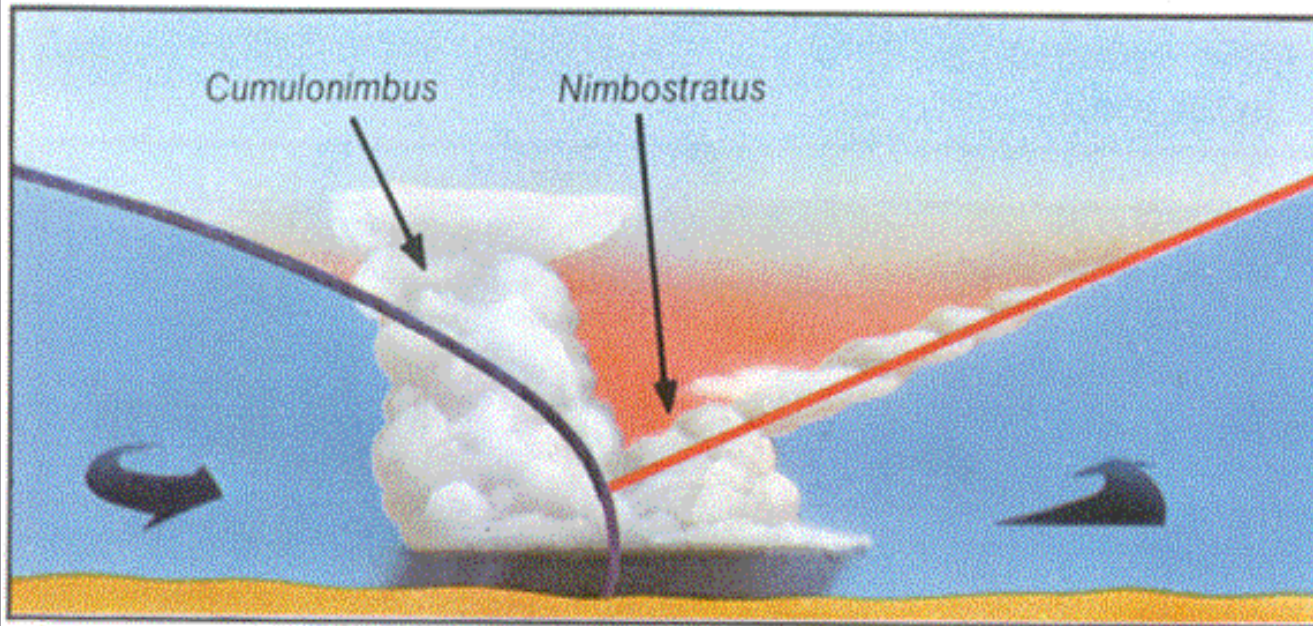
Warm air masses move slowly. Can be rainy or cloudy for several days. After it passes the weather is warm and humid.

Stationary Front



Two air masses are in a standoff!
Where they meet precipitation forms.

Occluded Front

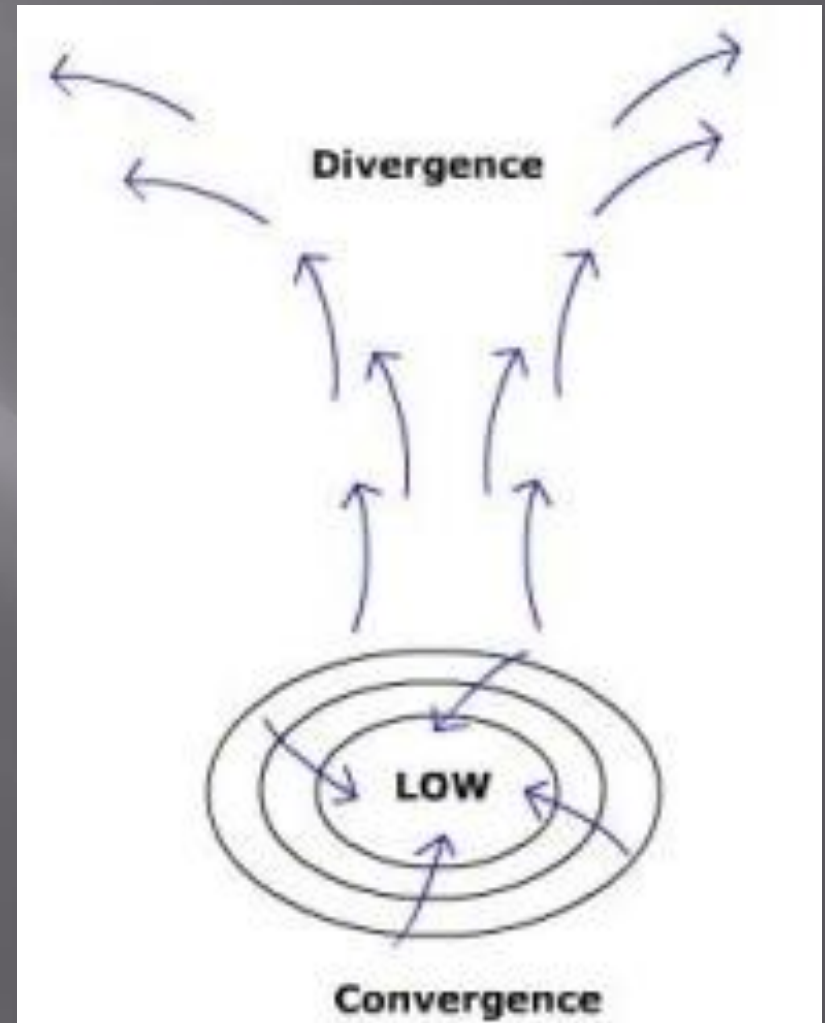


▲ Cross-section of an occlusion. The clouds on the warm and cold fronts have joined up. A pool of warm air, all that remains of the warm sector, rests on top of the cold polar air mass.

- Two cold air masses, cut off and lift up a warm air mass.
- Forms clouds and possibly precipitation.

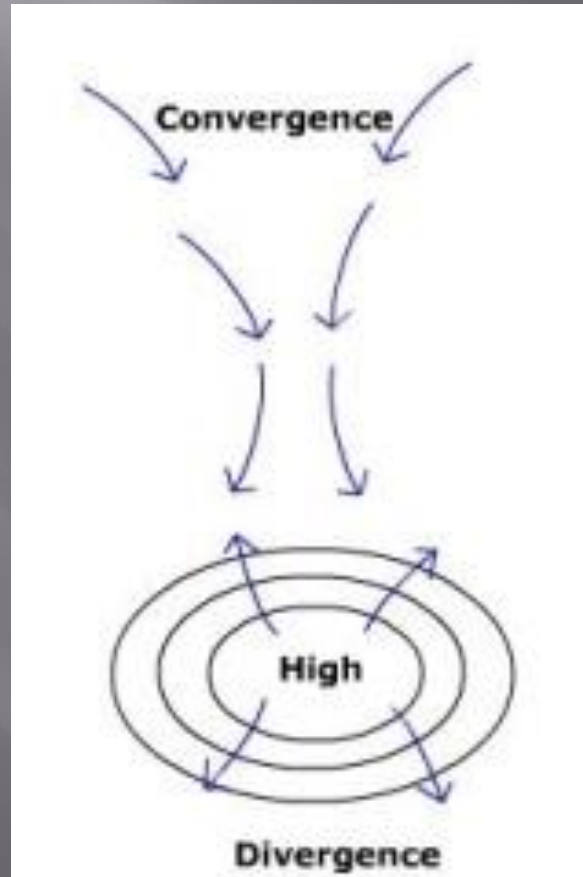
Cyclones – Low Pressure

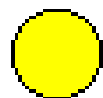
- ▣ A swirling center of low pressure.
- ▣ Clouds, winds and precipitation.
- ▣ Form at frontal boundaries.



Anticyclones – High Pressure

- ▣ High pressure centers of dry air.
- ▣ **Generally causes dry, clear weather.**
- ▣ Form at frontal boundaries.

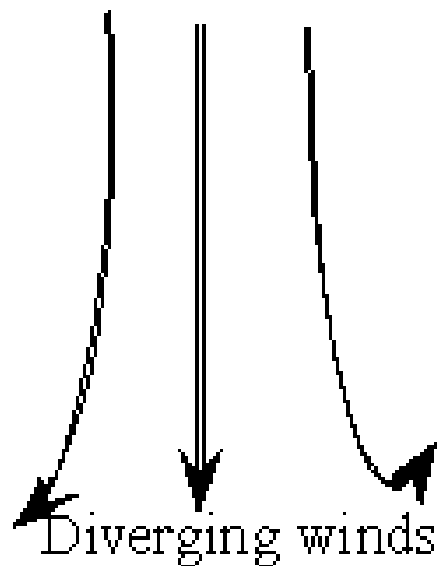




Calm, clear weather

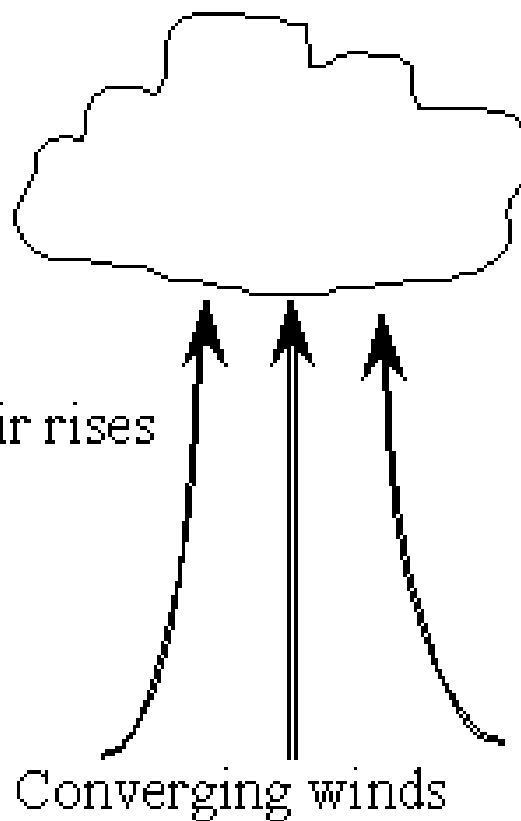
Stormy, cloudy weather

Cold air sinks



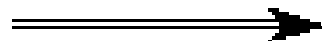
**HIGH PRESSURE
ANTICYCLONE**

Hot air rises



Converging winds

**LOW PRESSURE
CYCLONE**



Severe Weather



- ▣ A volume of water increases in a short period of time causing a body of water to overflow its channel.
- ▣ Flash flood- happens in a “flash”
- ▣ Advance warning, dams and levees are all safety measures and forms of flood control.



Floods



Droughts

- ▣ Long period of time with little rainfall.
- ▣ Typically caused by dry weather systems that remain in place for long periods of time.
- ▣ Water conservation is necessary

Thunderstorm



- ▣ Thunderstorms form in large CUMULONIMBUS clouds.
- ▣ Form when warm air is forced rapidly upwards along a cold front
- ▣ Characteristics:
 - Heavy Rain/possibly hail
 - Strong upward and downward winds (updrafts and downdrafts)
 - Lightning and Thunder

Tornadoes

- ▣ Develop in thick CUMULONIMBUS clouds
- ▣ Form when a warm humid air mass meets a dry cold air mass – warm air is forced upwards along a cold front to produce several thunderstorms which can turn into tornadoes
- ▣ Most damaging type of storm because they are not predictable

- ▣ Tornado Alley – central US from Texas to Nebraska/Iowa – nearly 800 tornadoes form in this area every year



Hurricanes

- ▣ Characteristics:
 - Winds over 119 km/hr
 - 600 km across
 - Form in the Atlantic, Pacific, or Indian Ocean
 - Strength of hurricane comes from the warm, moist air
 - Forms around LOW PRESSURE
- ▣ Hurricanes form over warm ocean water as a low pressure area – as the area grows in size and in strength it may become a tropical storm followed by a Hurricane if it continues to grow



Precipitation

- ▣ All year round in all areas of the world most precipitation begins in clouds as snow and melts when it reaches warmer temperatures. Precipitation will remain as snow if the air temperature is colder than 0 degrees Celsius
- ▣ 4 types of precipitation
 - Rain
 - Snow
 - Sleet
 - Hail