CHAPTER 2 NOTES

Humidity- amount of water vapor in the air (moisture, humidity, water vapor are all the same thing)

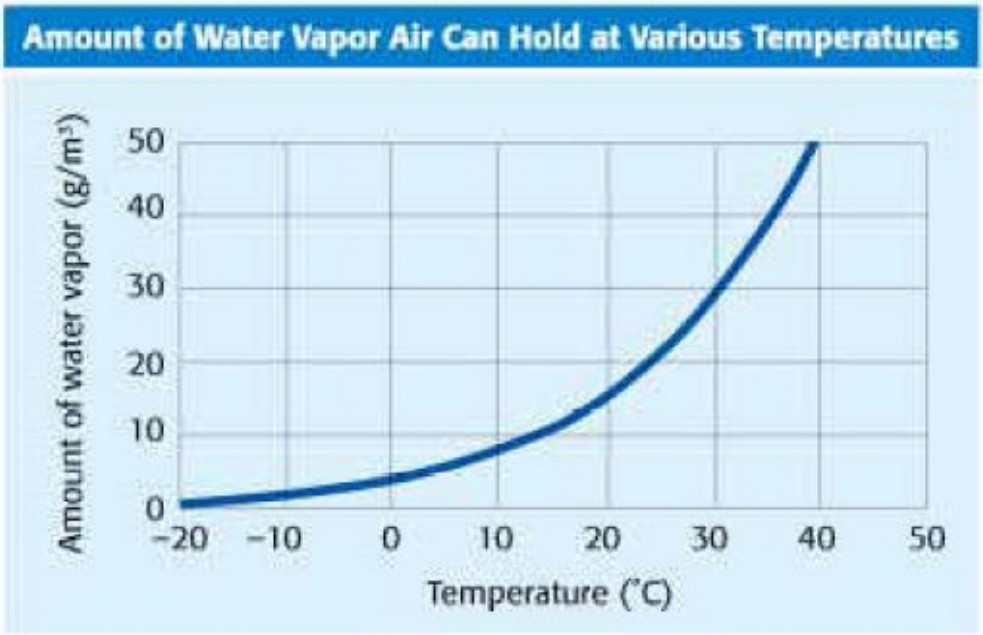
Relative humidity – amount of water vapor in the air compared with the amount of water vapor the air can hold at that particular temperature

30deg & 15 g/m3
__50__% humidity

20deg & 15 g/m3
_100_% humidity

40deg & 40 g/m3
_80_% humidity

40deg & 10 g/m3
_20_% humidity



RELATIVE HUMIDITY FORMULA:

$$\frac{\text{actual amount of water vapor}}{\text{amount of water vapor the air can hold}} \times 100$$

Psychrometer- device that measures relative humidity

Saturated – when we reach 100%
(can be achieved in 2 ways)

a) Add more water to the air
b) Cool the temperature of the air

Dewpoint- temperature at which saturation occurs

Condensation Nuclei– particle that a raindrop forms around (smoke, dust, pollen, volcanic ash, pollution)

Clouds – a collection of millions of tiny water droplets or ice crystals

Cirrus – highest, thin wispy clouds that contain ice crystals and occur in fair weather

Cumulus- fluffy, puffy, thick clouds
White= nice weather
Grey= storm/ precipitation

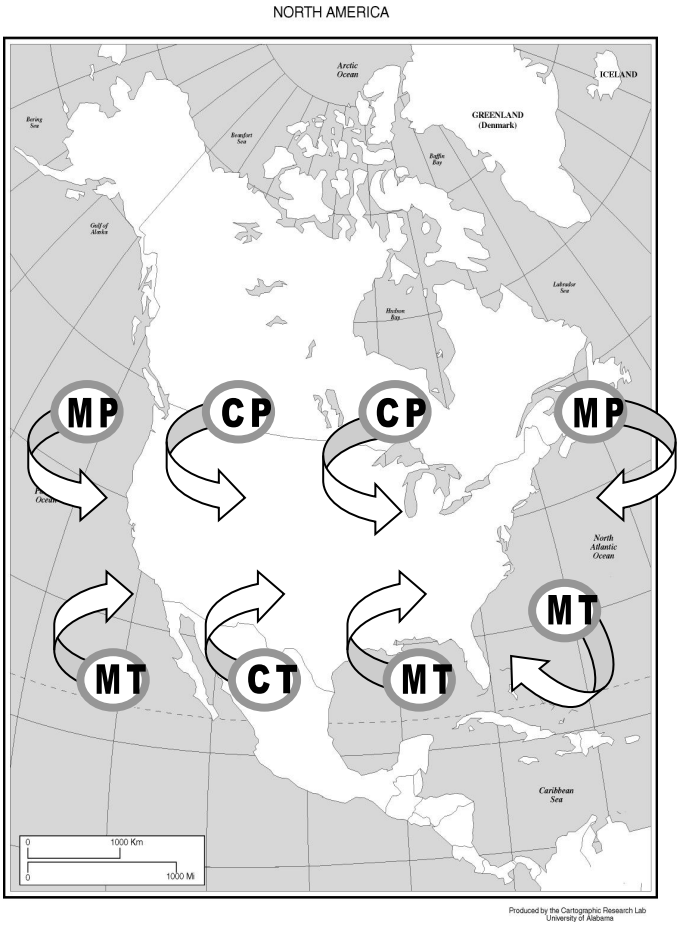
Stratus- "fuzzy" fog-like clouds that are associated with steady, light rain

Fog- stratus cloud on the ground

Cirro, cirrus = high clouds

Alto = medium level clouds

Air mass— large body of air with similar temperature and moisture



Maritime= wet air mass

Continental= dry air mass

Polar= cold air mass

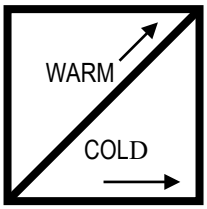
Tropical= warm air mass

A Fronts – boundary between air masses (the place where precipitation is happening)

Warm front- when a warm air mass runs into a cold air mass

1 Cirrus clouds form, signaling an approaching warm front

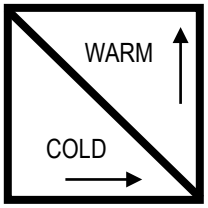
2 Stratus clouds form producing light, steady precipitation

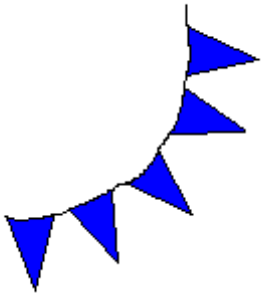


Cold front—cold air mass running into a warm air mass (rapid rising of warm air)

1 Cumulus clouds possibly severe precipitation

2 Severity determined by how fast cold front comes in and how much water is in the warm air mass

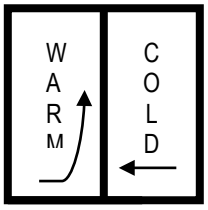


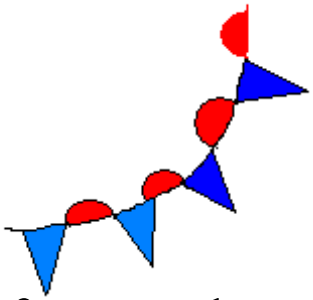


Stationary front- when air masses stop moving

1 Stratus clouds and steady precipitation for days

2 Cirrus clouds and nice weather away from the front



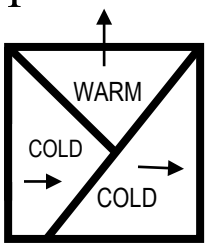


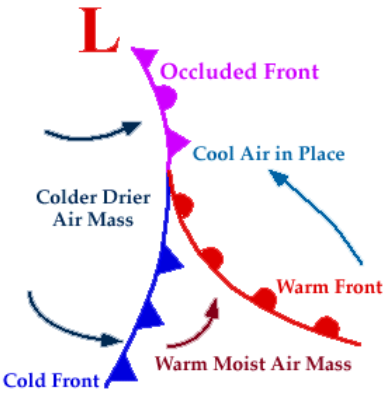
Occluded front- A cold front catches up to a warm front

(2 cold air masses push a warm air mass between)

1 Cumulus clouds form

2 steady precipitation and possible severe weather (tornado, blizzard)





B <u>Pressure/ wind</u>

1 Gentleness/severity caused by pressure differences between air masses

a) No difference in pressure= no wind

b) Small difference in pressure= gentle wind

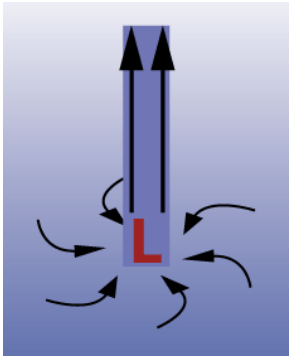
c) Great difference in pressure= great wind

C <u>Cyclone</u>-

1) Rotation=counterclockwise

2) air is rising

3) weather= stormy, rainy, precipitation

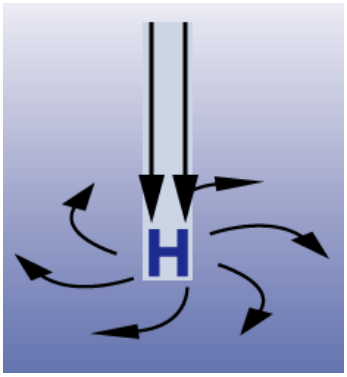


D <u>Anticyclone</u>-

1) Rotation= clockwise

2) air is sinking

3) Weather= nice, no weather



Severe weather 2-3- weather that causes property damage and sometimes death

A Thunderstorms—small intense weather systems

1 Strong winds-caused when raindrops falling to earth push air out of the way and form big pressure differences between the colliding air masses

2 **Heavy rain**- caused by great volumes of warm, moist air rising

3 **Lightning**- an electric discharge between positively charged areas and negatively charged areas
   a) Occurs between 2 clouds
   b) From cloud to earth
   c) Between 2 parts of the same cloud

4 **Thunder**- the sound that comes from the rapid heating and expansion of air due to a lightning strike. (air molecules slamming into each other)

5 Negative effects:
   a) Hail damage
   b) Flash floods- caused by the ground not being able to soak up the excessive rain
   c) Tornado creation
   d) Property damage
   e) Death
   f) Forest fires (lightning)

6 Safety measures:
   a) If outside, get away from trees and crouch down
   b) Stay out of water

B Tornados- small spinning column of air with high wind, low pressure (creates a vacuum), and touches the ground

1 Wind speeds
   a) Typical tornado- 120-180 km/hour
   b) Violent tornado- up to 500 km/hour
2 Size
   a) Destruction path- 8 km
   c) Width of funnel-10-60 meters
3 Duration - minutes
4 Safety measures:
   a) Go to basement or cellar or a room in the center of the building
   b) If outside, lie down in an open field or deep ditch
   c) Cover and protect your head

B **Hurricane**- large rotating tropical weather system with high winds
1 Wind speed- at least 120 km/hr
2 size
   a) Destruction path- thousands of km
   b) Width of storm-- 160- 1500 km in diameter
3 Duration - days
4 Formed when a group of low pressure storms meet over the ocean, and then spin due to winds from different directions
5 **Storm surge**- wall of water that builds up due to the strong winds and low pressure.
6 Safety measures:
   a) Evacuate
   b) Have food and water stored
   c) Cover windows with plywood
   d) Stay inside
   e) Stay out of floodwaters

Forecasting the Weather 2-4

C **Weather forecast**- prediction of weather conditions

D **Meteorologist** – person who observes and collects weather data

E Weather instruments:

1. **Thermometer**-glass tube with expanding liquid that measures temperature
2. **Barometer**- dial gauge or U-shaped glass tube that measures air pressure
3. **Windsock**—cloth bag open at both ends that shows wind direction
4. **Wind vane** –arrow shaped object that spins and points into the direction of the wind
5. **Anemometer**- spinning cups connected to an electrical tool that measures wind speed
6. **Psychrometer**-2 thermometers that you spin to find relative humidity
7. **Hygrometer**- dial shaped device that measures relative humidity
8. **Radar**- high tech instrument that finds the location, movement, amount and type of precipitation. Used to track storms
9. **Weather satellite**- instrument orbiting earth that gathers weather data and sends it back to earth
10. **Weather maps**- pictures used to communicate the weather to others