Warm-Up

Today you will need your notebook , pencil and dry erase marker.
← ← ← Please turn in your weekly homework!
We are in the computer lab on Monday!

- **Review**: How does wind form?
- *Hint: 4 "steps"*

Warm-Up

Today you will need your notebook , and pencil.
HW due Friday.

- **Review**: How does wind form?

1. **Radiation**
2. **Conduction**
3. **Convection**
4. **Wind**

Weather Variables
• • •
March 6, 2015

Goal and Outline

- **Goal**
- Assemble our resources and references for weather by completing *The Ultimate Weather Reference Tables*

- **Outline**
- Complete the table through class discussion
- Practice relative humidity and dew point readings with an activity

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The Ultimate Weather Reference Tables

- Keep in your notebook
- Valuable resource as we move forward with weather and forecasting
- Complete the missing areas of the tables today!

Wind Speed

Wind is caused by air flowing from high pressure to low pressure
Its direction is influenced by the Earth's rotation

Review: Instruments Measuring Wind

- **Wind Sock**
  - o Measures direction and speed of wind using fabric

- **Anemometer**
  - o Measures direction and speed of wind

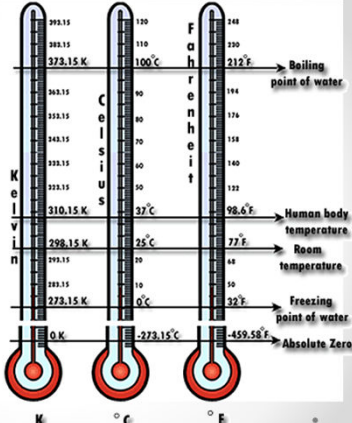*Different degrees of the angle and length of the sock infer wind speed*

3 cups spin in wind
Points deflect wind
Vane aligns with wind
Dial for measuring wind direction
Wind speed on LCD display
Measuring instruments in aluminum case

https://www.youtube.com/watch?v=SnImd5RU8Ek

Temperature

- Measure hot/cold. 3 units: Fahrenheit, Celsius, and Kelvin.
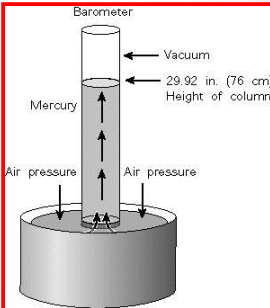
Measurement Instrument: **Thermometer**

Air Pressure

- **Air Pressure:** Caused by the weight of the atmosphere

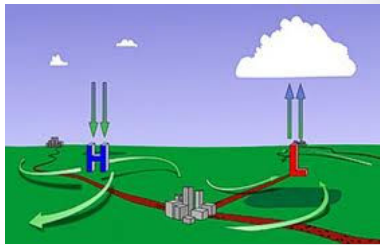Above each square inch of Earth's surface is a column of air the weighs 14.7 pounds

ATMOSPHERE
ABOUT 15 POUNDS PER SQUARE INCH

Air Pressure Units
Psi, Atmospheres, Pascal, Torr, mm Hg

Measurement Instrument: **Barometer**

Barometer
Vacuum
29.92 in. (76 cm) Height of column
Mercury
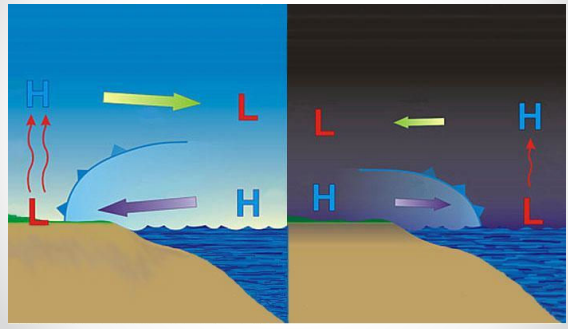Air pressure   Air pressure

H and L

- **H** is an area of high pressure
  - o **Description:** Cool, dry air
  - o **Weather:** Mild, sunny blue skies

- **L** is an area of low pressure
  - o **Description:** Warm, moist air
  - o **Weather:** Stormy, wet weather

Video Clip on High and Low Pressure Systems

- https://www.youtube.com/watch?v=aiYyCurh_SU
- 3:30

Types of Air Masses

c - <u>continental</u>   P – <u>Polar Latitudes</u>

m - <u>marine</u>   T – <u>Tropical Latitudes</u>

Combinations

- **cP** - continental polar cold, dry, stable
- **cT** - continental tropical hot, dry, stable air aloft, unstable surface air
- **mP** - maritime polar cool, moist, and unstable
- **mT** - maritime tropical warm, moist, usually unstable

Cloud Demonstration

- Cloud in a bottle

High Pressure   **Low Pressure**

Vapor inside the bottle when under high pressure – clear skies.

Sudden drop in pressure, produces clouds and thus stormy weather

Cloud Formation

Weather and Clouds occur in the <u>troposphere</u>

1) **Warm air rises, expands and cools**

2) **Cool air cannot hold as much water vapor as warm air—so some of the vapor condenses droplets onto tiny particles floating in the air**

3) **Billions of these droplets come together we see a cloud**

Types of Clouds

Name	Description	Weather Prediction
Cirrus	High clouds. Composed of ice. Thin and wispy.	Fair to pleasant weather
Cumulus	White, puffy clouds	Fair to pleasant weather
Cumulonimbis	Type of cumulus that are high and very large	Heavy rain, snow, hail lightning and even tornados
Stratus	Grayish clouds that resemble fog that doesn't reach the ground	Light mist or drizzle
Fog	Cloud on the ground	n/a

Make the Match!

Cumulus   **Cirrus**

Cumulonimbis

Stratus

Humidity

- **Humidity:** <u>amount of water vapor in the air.</u>

Measurement Instrument: **Hygrometer**

Relative Humidity

- **Relative Humidity** – is the % of water vapor in the air compared to how much it can hold at that temperature

- If the air is at 100% relative humidity, sweat will not evaporate into the air. As a result, we feel much hotter

Dew Point

- **Dew Point** - is the temperature when water vapor turns to liquid

Sling Psychrometer

Summary Video on Humidity and Dew Point

- http://pbearthscience.wikispaces.com/Humidity
- 2:20

Sunshine

- Sun's light, visible, ultraviolet and infrared radiation

Measurement Instrument:
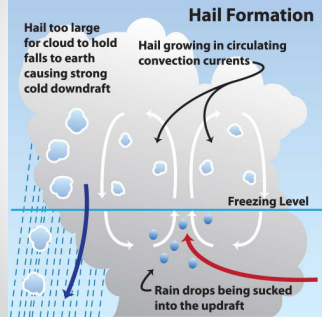**Campbell Stokes Recorder**

Precipitation

- **Rain –** Water vapor that forms droplets and falls to the earth

- **Snow –** Vapor that changes directly into crystalline flakes at 32°F or 0°C

- **Sleet –** Droplets that freeze as they get closer to the ground

Measurement Instrument:
Rain Gauge

Precipitation

- **Hail –** Droplets of water freeze around ice crystals

Hail Formation

Hail too large for cloud to hold falls to earth causing strong cold downdraft

Hail growing in circulating convection currents

Freezing Level

Rain drops being sucked into the updraft

Measurement Instrument:
Hail Pad

Large Hail ≥ 1"