

Name: \_\_\_\_\_

### Causes of Weather

The last few weeks, we have been learning about different aspects of Earth’s atmosphere. We have discussed the different layers, air pressure and relative humidity, and how the water cycle operates in the atmosphere. Weather and climate are greatly affected by all these mentioned atmospheric components; however, weather and climate are two different entities.

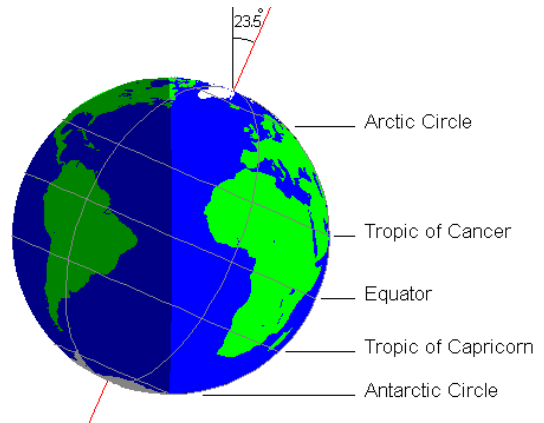
List the similarities and differences between weather and climate.

Weather	Both	Climate

Now we are ready to discuss how weather operates in the atmosphere. Different locations around the world experience different forms of weather. Latitude location and tilt has a significant role in terms of weather variations during the year.

#### *Heating Earth’s atmosphere*

How does Earth’s tilt and latitude location affect weather?

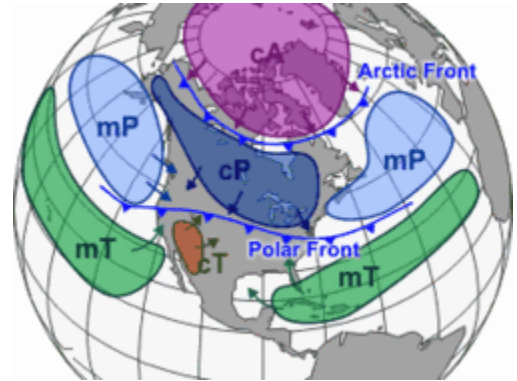


Explain how flashing your cell phone flashlight models Earth’s axis tilt and how light is radiated to the surface.

How the heat does from the Sun's radiation gets redistributed around the planet?

*Air Mass:*

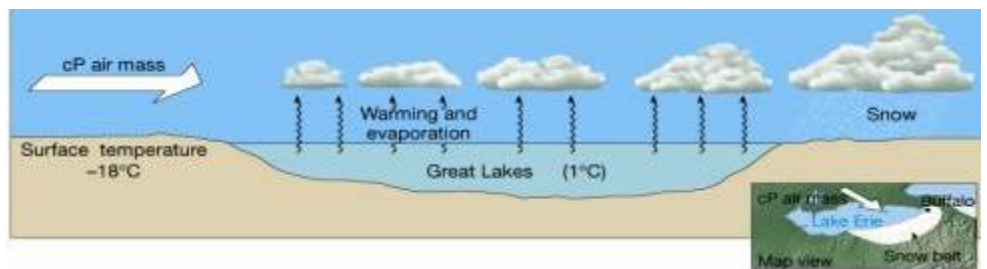
What is an air mass and where do they form?



*Types of Air Masses:*

Air Mass Type	Weather Map Symbol	Source Region	Winter Characteristic	Summer Characteristic

Why and how do air masses change?



## Coriolis Effect

The past few weeks, we have been learning about the atmosphere and how it has different components incorporated into it that affect the formation of weather events.. The atmosphere is constantly moving in different directions. A lot of this movement deals with how the Earth rotates and latitude location. This creates a natural phenomenon known as the Coriolis Effect.

In the youtube clip, describe the motion path of the ball as the people throw it while they are stationary?

Describe the motion path of the ball as the people throw it while they are moving?

What is the Coriolis Effect? How does it operate in Earth's atmosphere?



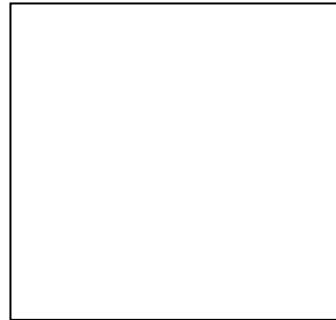
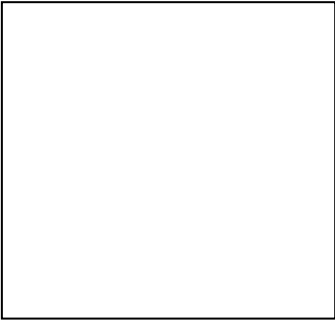
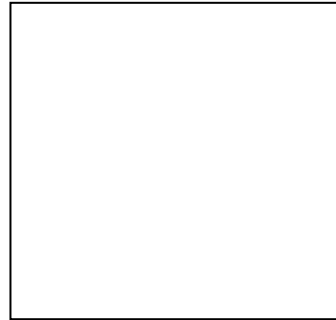
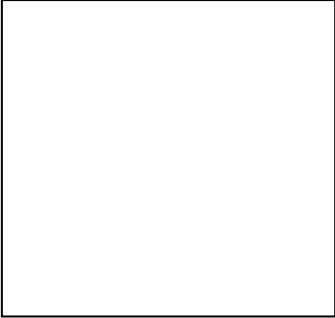
**Jet Stream**

## Weather Fronts and Pressure Systems

The past couple weeks, we have been learning about the basic atmospheric conditions to start formulate weather events that impact our daily lives. Now we are going to apply those basics to the formation of these weather events. As we know, the atmosphere is constantly moving and changing due to several factors.

What is a front?

Diagram the four types of fronts and describe each of the fronts.

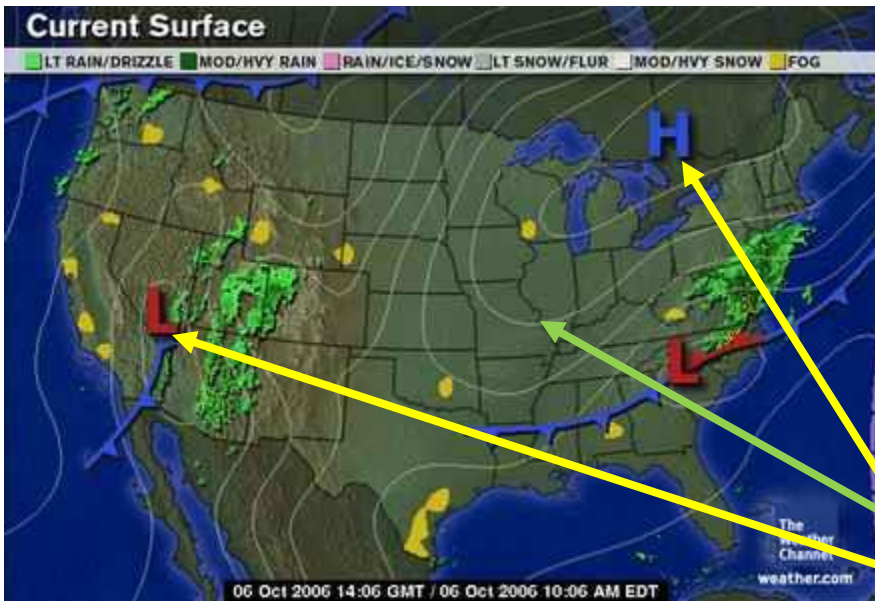


How do weather fronts affect pressure systems?


## Weather Maps and Station Models

### Weather Maps:

The purpose of a weather map is to forecast the weather over a larger region or area. Weather maps show how weather fronts move from one area to another and how areas of high and low pressure affect weather patterns in specific regions. Weather maps also show how higher atmospheric pressure (air pressure) is focused around high pressure systems. These are represented by lines on the map that appear like contour (elevation) lines on a topographic map. These lines of increasing or decreasing atmospheric pressure are known as isobars and they connect large areas experiencing the same air pressure value. In areas of high pressure, expect fair (sunny) weather. For most of the year, Arizona experiences several high pressure systems. Low pressures systems are often associated with rainy to severe weather. They often have a small warm front leading the way, followed by a cold front which brings in a lot of rain and eventually colder temperatures.

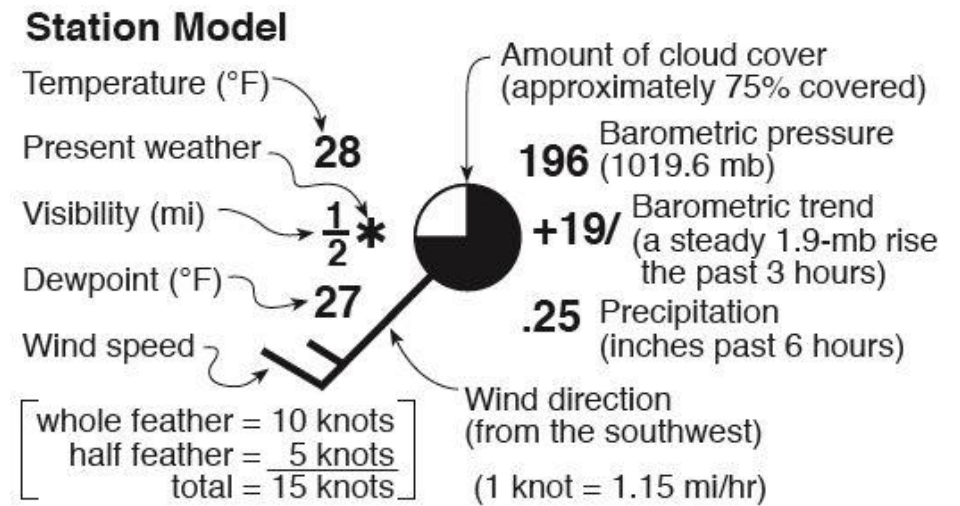


- Cold Front
- Warm Front
- Stationary Front
- Occluded Front
- Isobar
- High and Low Pressure

What is an isobar and how are they used to show how weather systems move?

### Station Models

Station Models are more used to show more localized weather events. They look complicated to read, but one most practice using them and know the different components to them. They show all the necessary information to describe atmospheric conditions. Often, you will see them appear on weather maps so that you can compare atmospheric conditions from one city to another.



Station Model Symbols and Cloud Cover:

**Significant Weather**

••	LIGHT RAIN	▽	RAIN SHOWER
•••	MODERATE RAIN	∞	FREEZING RAIN
••••	HEAVY RAIN	==	FOG
* *	LIGHT SNOW	∞	HAZE
* * *	MODERATE SNOW	☉	HURRICANE
* * *	HEAVY SNOW	⚡	THUNDERSTORM
△	SLEET (ICE PELLETS)		NO SIGNIFICANT WEATHER

**Cloud Cover**

○	CLEAR
○	SCATTERED
○ (1/4 shaded)	FEW CLOUDS
○ (1/2 shaded)	PARTLY CLOUDY
○ (3/4 shaded)	MOSTLY CLOUDY
●	OVERCAST
⊗	OBSCURED

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CLOUD ABBREVIATION	C <sub>L</sub>	DESCRIPTION (Abridged from W.M.O. Code)	C <sub>M</sub>	DESCRIPTION (Abridged from W.M.O. Code)	C <sub>H</sub>	DESCRIPTION (Abridged from W.M.O. Code)
St or Fs - Stratus or Fractostratus	1	Cu, fair weather, little vertical development & flattened	1	Thin As (most of cloud layer semitransparent)	1	Filaments of Ci, or "mare's tails", scattered and not increasing
Ci - Cirrus	2	Cu, considerable development, towering with or without other Cu or Sc bases at same level	2	Thick As, greater part sufficiently dense to hide sun (or moon), or Ns	2	Dense Ci in patches or twisted sheaves, usually not increasing, sometimes like remains of Cb; or towers tufts
Cs - Cirrostratus	3	Cb with tops lacking clear-out outlines, but distinctly not ciriform or anvil shaped; with or without Cu, Sc, St	3	Thin Ac, mostly semi-transparent; cloud elements not changing much at a single level	3	Dense Ci, often anvil-shaped derived from or associated Cb
Cc - Cirrocumulus	4	Sc formed by spreading out of Cu; Cu often present also	4	Thin Ac in patches; cloud elements continually changing and/or occurring at more than one level	4	Ci, often hook-shaped gradually spreading over the sky and usually thickening as a whole
Ac - Alto cumulus	5	Sc not formed by spreading out of Cu	5	Thin Ac in bands or in a layer gradually spreading over sky and usually thickening as a whole	5	Ci and Cs, often in converging bands or Ca alone; generally overspreading and growing denser; the continuous layer not reaching 45 altitude
As - Altostratus	6	St or Fs or both, but no Fs of bad weather	6	Ac formed by the spreading out of Cu	6	Ci & Cs often in converging bands or Ca alone; generally overspreading and growing denser the continuous layer exceeding 45 altitude
Sc - Stratocumulus	7	Fs and/or Fc of bad weather (scud)	7	Double-layered Ac, or a thick layer of Ac, not increasing; or Ac with As and/or Ns	7	Veil of Cs covering the entire sky
Cu or Fc - Cumulus or Fracto cumulus	8	Cu and Sc (not formed by spreading out of Cu) with bases at different levels	8	Ac in the form of Cu-shaped tufts or Ac with funnels	8	Cs not increasing and not covering entire sky
Cb - Cumulonimbus	9	Cb having a clearly fibrous (ciriform) top, often anvil-shaped, with or without Cu Sc, ST or scud	9	Ac of a chaotic sky, usually at different levels; patches of dense Ci are usually present	9	Cc alone or Cc with some Ci or Ca but the Cc being the main ciriform cloud

FIGURE 5-7. Cloud Symbols