Bellringer REVIEW:

- What are some things that cause wind?
- What causes the Coriolis Effect?
- What two things create an atmospheric circulation system?

Learning Objectives:

- I can demonstrate the difference between Relative & Absolute Humidity
- I can calculate the dew point.

Check for Understanding Questions:

- What is the difference between Relative Humidity and Absolute Humidity?
- Why does dew form on the grass or your car in the morning?

Weather Project

During this week we will be watching the weather. We will record the forecasted high and low temperatures for each day. Also record what kind of weather occurs, for example: cloudy, rainy, cold, clear, sunny, etc. We will record the actual temperatures on the following day. All data will be recorded into data tables as seen below.

Forecast temperatures and weather			
Day	High °F	Low °F	Weather
Mon	34	12	Fog
Tue	37	16	P Cloudy
Wed	46	27	Clear
Thurs	47	28	P Cloudy
Fri	50	29	Clear

Actual temperatures and weather			
Day	High °F	Low °F	Weather
Mon	28	10	Fog
Tue	38	13	P Cloudy
Wed			
Thurs			
Fri			

Look up your favorite weather app or news and copy down the above information. If you'd like to keep track of additional information (dew point, humidity, etc.) go for it!

Absolute humidity is the measure of water vapor (moisture) in the air, regardless of temperature. It is expressed as grams of moisture per cubic meter of air (g/m3).

The maximum absolute humidity of warm air at 30°C/86°F is approximately 30g of water vapor - 30g/m3. The maximum absolute humidity of cold air at 0°C/32°F is approximately 5g of water vapor - 5g/m3.

Relative humidity also measures water vapor but **RELATIVE** to the temperature of the air. It is expressed as the amount of water vapor in the air as a **percentage** of the total amount that **could** be held at its current temperature.

Warm air can hold far more moisture than cold air meaning that the relative humidity of cold air would be far higher than warm air if their absolute humidity levels were equal.

Relative humidity is cited in weather forecasts as it affects how we **"feel"** temperature.

As an example, consider two containers:

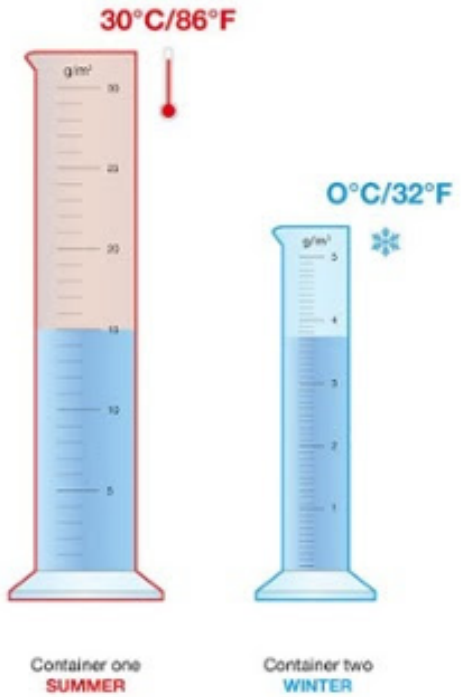
Container one has a maximum volume of 30g of water and is half full- **it contains 50% of its capacity.**

Container two has a maximum volume of 5g of water and is three quarters full- **it contains 75% of its capacity.**

Container one contains **four times** as much water as container two, yet actually contains a lower percentage.

*If we now call container one **"summer"** and container two **"winter"**,* we can start to differentiate between "absolute" and "relative" humidity.

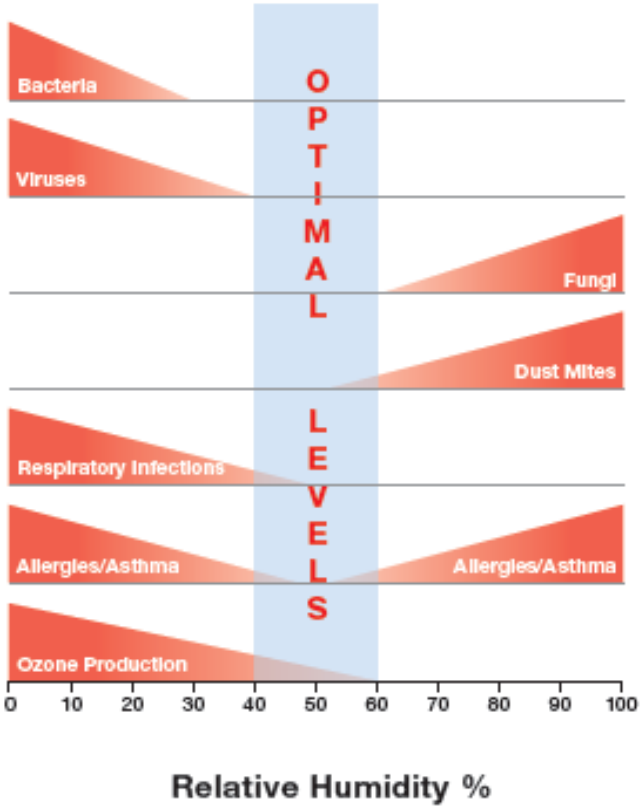
Human body temperature is dependent on the air as it absorbs and removes moisture from our skin to cool us down. If the relative humidity is high, the amount of water evaporating from our skin is limited so we feel warm and stifled.



Health and comfort

This graph shows that by maintaining an optimal indoor RH of 40-60% the potential adverse effects for occupants, and the dwelling itself, are at their lowest levels.

A pleasant indoor climate is essential for a sense of well-being in the home. Room humidity can have a major impact on the quality of the living environment. A relative humidity (RH) of 40-60% is generally considered to be optimal for a comfortable and healthy home. Too much moisture can lead to mold and overheating. Too little causes dry eyes, chapped lips and an environment in which bacteria and viruses can thrive.



The dew point is the temperature at which the air is saturated with respect to water vapor over a liquid surface. When the temperature is equal to the dew point then the relative humidity is 100%. The common ways for the relative humidity to be 100% is to

1) cool the air to the dewpoint

2) evaporate moisture into the air until the air is saturated

3) lift the air until it adiabatically cools to the dew point.

If you are interested in a simpler calculation that gives an approximation of dew point temperature if you know the observed temperature and relative humidity, the following formula: Td = T - ((100 - RH)/5.)

How Can You Determine the Dew Point?
Data Table

Location	Dew Point
Classroom	
Outdoors	

Procedure:

1. Fill the beaker about half full with warm water.
2. Place the thermometer in the water.
3. Add a cube of ice. Watch the sides of the beaker for condensation as your stir the water. Use a spoon to stir, do not use the thermometer.
4. Continue adding a cube of ice, and continue stirring until condensation, or dew, forms on the outside of the can. Record this temperature as the dew point in the data table.
5. Remove the contents from the can.
6. Repeat steps 1-4 outdoors.

Can you explain this phenomenonomenon??

Check for Understanding Questions:

- What is the difference between Relative Humidity and Absolute Humidity?
- Why does dew form on the grass or your car in the morning?

Learning Objectives: Did you accomplish them?

- I can demonstrate the difference between Relative & Absolute Humidity
- I can calculate the dew point.

Self-Evaluation

- How well did you understand the material today?
  (1-Lost, 2- understand, 3-can teach it)
- How well did you and your team members participate in class?
  (1-didn't do anything, 2-Bare minimum, 3-fully participated)