

Slingin' that Psychrometer: Measuring Relative Humidity and Dew Point Geology Mr. Traeger
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Name: _____ Period: _____ Date: _____

Purpose

To measure the relative humidity and dew point of air. To see how relative humidity varies from place to place. To see how temperature affects relative humidity.

Materials

- Vernier Logger and Temperature Probes (2)
- Distilled water

Procedure

1. Get into groups of maximum 4. Obtain a Vernier Lab Pro and two temperature probes. One of the probes will have a piece of shoelace on the end of it. This is called the **wet bulb** thermometer.
2. Make sure that the dry bulb thermometer is in channel 1 and the wet bulb thermometer is in channel 2.
3. Turn on the calculator and select **APPS**, then scroll to **Datamate**. Hit **Enter**.
4. Press the **Clear** button and check to make sure that the correct temperatures are showing.
5. Soak the wet bulb of the thermometer with **distilled** water. The dry probe stays dry.
6. Move both probes in the air stream rapidly like you are playing the drums. Keep doing this until the temperatures for both probes stabilizes. This should take about 20 seconds for each trial. Hold the probes firmly. **DO NOT** hold them by the cord!
7. Immediately record the dry bulb temperature and wet bulb temperature.
8. Repeat steps 1-7 another two times at each site for accuracy.
9. Fill in the other blanks by using the supplementary instructions for the relative humidity measurements called **Psychrometer**. I will show you how to do this.

Sling Psychrometer Measurements

Site Description	Dry-Bulb Temp	Wet-Bulb Temp	(Dry Bulb . Wet Bulb) or Wet Bulb Depression	Dew Point Temp	Vapor Pressure at Dry Temp	Vapor Pressure at Dew Point	Relative Humidity
Example	22 °C	20 °C	2 °C	17 °C	26.1 mb	19.2 mb	(19.2/26.1) x 100 = 74%
Classroom: Trial 1							
Classroom: Trial 2							
Classroom: Average R/H							

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Site Description	Dry-Bulb Temp	Wet-Bulb Temp	(Dry Bulb . Wet Bulb) or Wet Bulb Depression	Dew Point Temp	Vapor Pressure at Dry Temp	Vapor Pressure at Dew Point	Relative Humidity
Sunny: Trial 1							
Sunny: Trial 2							
Sunny: Average R/H							
Shady: Trial 1							
Shady: Trial 2							
Shady: Average R/H							

Questions

1. Why is the temperature of the wet bulb thermometer lower in all cases? What phase change is causing this?
2. What is specific humidity?
3. What is relative humidity?
4. Which type of humidity, specific or relative, is affected by temperature?
5. Look at your data. Was there any difference between relative humidity in the sun compared to relative humidity in the shade? Why?
6. Warmer air will hold more moisture. If this statement is true, what do you think will happen to *relative* humidity when the temperature rises? What will happen to *specific* humidity?
7. What is dew point?
8. What are condensation nuclei? How do they help clouds/fog to form?
9. What will happen when the air temperature and the dew point temperature are the same? What will be the relative humidity reading when this happens?