Dew Point Experiment

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GRADE LEVEL

6
7
8

CONTENT TOPICS

Physical Science
Science

DESCRIPTION

Use sensors to collect data for Dew Point temperatures in different environments. Analyze and interpret data using the SparkVue app. Use sensors to collect data for Dew Point temperatures in different environments. Analyze and interpret data using the SparkVue app.

SUGGESTED STANDARDS CONNECTIONS

NGSS	MS-ESS2-3 Earth's Systems

Name _____ Date _____

Dew Point Measurements

If you wake up early in the morning sometimes there will be water droplets on the grass outside, even though it did not rain the night before. That water is known as “dew” and is formed when the temperature becomes lower than the “Dew Point”. The Dew Point is the temperature at which humid air condenses and becomes water. This point varies depending on how much water vapor is in the air. Using the PASCO sensors and iPod Touch you will look at different Dew Points and how they change in different environments.

BENCHMARKS ACHIEVED

In this experiment, you will

- Use the PASCO Hardware and iPod Touch to measure different Dew Points

MATERIALS

one 76 oz. tupperware container (with lid)
PASCO Dew Point Sensor
PASCO Sensor Interface
iPod Touch

* The 76 oz. tupperware container can be substituted with any container (with lid) large enough to place the PASCO Hardware inside of it.

PROCEDURE

1. Set up your iPod Touch and PASCO Hardware to collect data.
    a. Connect the sensor interface to the Dew Point sensor.
    b. Turn the sensor interface device on and connect it to the iPod touch via Bluetooth.
    c. Open SPARKvue and create a new experiment, naming it ‘Dew Point Measurement” and ensure you are measuring the Dew Point (not Relative Humidity). If you are more comfortable measuring the temperature in Fahrenheit, you may do so.

2. Measure the Dew Point of the classroom.
    a. Put the Dew Point sensor on the table (the less wind hitting it, the better).
    b. In SPARKvue, select the ‘Dew Point Measurement’ experiment and begin collecting data.
    c. Keep the sensor still until the temperature stabilizes.
    d. Record the temperature.

3. Measure the Dew Point of outside.
    a. Take the Dew Point sensor outside.
    b. While holding the sensor, repeat parts b, c, and d from Step 2.

4. Measure the Dew Point of your breath.
    a. Take the Dew Point sensor back into the classroom and place into the tupperware container.
    b. Open the lid and exhale warm air into the container. There should be enough air to fill the entire container.
    c. Quickly close the lid after there is enough warm air to saturate the container.
    d. In SPARKvue, select the ‘Dew Point Measurement’ experiment and begin collecting data.
    e. Wait until the temperature stabilizes.
    f. Record the temperature.

5. Clean up the area and return your materials to their designated spots.

DATA

Dew Point temperatures for different environments:

Environment	Dew Point Temperature

PROCESSING THE DATA

1. Convert the Dew Point temperatures into Fahrenheit (or Celsius).
   *Note: $°F = (°C \times \frac{9}{5}) + 32$ and $°C = (°F - 32) \times (\frac{5}{9})$

2. In the space provided below, explain how humidity and dew point temperatures are related. Why are they related this way?

3. Using the data you collected and the relation made in question 2, rate the environments from most humid to least humid.

Humidity	Environment
MOST HUMID	
MODERATELY HUMID	
LEAST HUMID	

EXTENSION

1. Does the ambient temperature of an environment change the Dew Point temperature?
2. Research and explain why clouds form at altitudes.