Investigate Your Local Weather

Weather is the current state of the atmosphere (the air above the earth), at a specific location and time. When you see a weather forecast on television or the internet, you typically see predicted values for temperature, relative humidity, wind speed, barometric pressure, and chance of precipitation. These values are usually generated by models developed by meteorologists.

In this activity, your teacher will put you into groups and assign you to measure the temperature, relative humidity, or wind speed. After you have collected the data, you will see what other groups measured and then analyze the data. Questions to think about while you are looking at your data are,

- How does the weather in your location compare to the weather forecast for your location?
- In a small area, such as a school campus, do you think all the measurements are the same at every location or does it vary?

Materials

Graphical Analysis 4 app on a Chromebook, laptop, or mobile device
Go Direct Weather Sensor
meter stick
weather report for your location

Procedure

1. As a class, identify two locations where you will collect data. Choose locations that are different from each other, such as
   1) the middle of a field and 2) close to a building
   OR
   1) the north side of a building and 2) the south side of the same building

2. Set up the Weather Sensor and Graphical Analysis.
   a. Launch Graphical Analysis.
   b. Connect the Go Direct Weather Sensor to your Chromebook, laptop, or mobile device.
   c. Click or tap Sensor Channels.
   d. Select the channel your teacher assigned your group. **Note**: If you are collecting Wind Speed data, the channel is already selected.
   e. Click or tap Done.

3. As a class, discuss which units you will use when collecting your data.
    a. Record the units you chose in the spaces provided in the data table.
    b. If necessary, change the units in Graphical Analysis. To do this, click or tap the meter for the channel(s) you want to change, and choose the correct unit.

4. Take the data-collection equipment to the first location.

5. Describe the location and collect data at 10 cm.
    a. Record a description and observations of the location. You may use words, a sketch, or a photo, as long as it can be submitted as part of your report.
    b. Position the Weather Sensor so the bottom of the sensor is 10 cm above the ground and the sensor is facing into the wind. **Note**: Make sure not to block the wind as it blows through the sensor.
    c. Start data collection and hold the sensor steady for 60 seconds. Data collection will end automatically.

6. Once data collection is complete, determine the mean (average) of your data.
    a. Click or tap Graph Tools, , and choose View Statistics.
    b. Record the mean (average) value in your data table.

7. Collect data at 90 cm.
    a. Move the sensor so that the bottom of the sensor is 90 cm above the ground, still facing into the wind.
    b. Start data collection and hold the sensor steady for 60 seconds. **Note**: The previous data set is automatically stored.
    c. Repeat Step 6 to analyze and record data for 90 cm.

8. Move to the second location and repeat Steps 5–7.

9. Once you are back in the classroom, fill in the rest of the data table with the data collected by the other groups.

Data and Observations

	Location 1		Location 2	
Date and time				
Description and observations				
Height above ground surface (cm)	10	90	10	90
Wind speed (_____)				
Temperature (_____)				
Relative humidity (%)				

Analysis Questions

1. How are the two places you collected data different? How are the two places you collected data similar?
2. Would you expect differences between the data you collected at 10 cm and 90 cm? Why or why not?
3. Compare your measurements to the forecast for your local area during the time you collected the data. How do they compare?
4. What kind of weather patterns do you see at different times of the year in your area?
5. If you had to choose one location for a permanent weather station, would you select something similar to those that you used for this experiment or would you try a different location? What factors would you use to decide on an ideal location?