Build a Weather Station

Overview: With a student-made weather station (that tracks temperature, rainfall, wind speed and direction, barometric pressure, humidity) and the Internet, students measure weather in a variety of ways, write about procedures, make predictions, and use averaging.

Meteorologists study the weather by recording and analyzing data. You can become an amateur meteorologist by building your own weather station and keeping a record of your measurements. After a while, you'll notice the weather patterns that allow meteorologists to forecast the weather.

Episode Connection: Weather & Science Research

Objectives

- Students will observe and describe weather.
- Students present data about weather through journals, discussions, and graphs.
- Students will make predictions by averaging.

Materials

- Weather Station
  - Thermometer
  - Barometer
  - Rain Gauge
  - Hygrometer
  - Weather Vane
  - Anemometer
  - Compass

  For more details on creating your Weather Station devices go to http://www.fi.edu/weather/todo/todo.html
- Journal for each student
- Graph paper
- Computer with Internet connection and Software for Data Entry Graphing (i.e. MS Excel, Mac OS X Numbers)

Procedure

1. Discuss local weather; have students predict local weather based on their current observations.
2. Set up a weather station in the classroom or somewhere on school grounds. You can have the class divide into 2 or more groups, 1 group using the student built

weather station and the other using internet weather sites (i.e. weather.com). Have the groups compare observations and results.
Note: If you have access to mobile devices such as iPod Touch, iPad or Adroid devices you can use a reliable weather app such as The Weather Channel's App or AccuWeather's Weather App.

3. Have students make recording materials, such as charts and graphs. You can use both graph paper and computer software to see if they get the same results. - A ruled ledger or notebook is an ideal place to record the measurements. List measurement types down the side (one event per line) and print the dates across the top to create a simple grid. See sample grid below.
4. Decide how often students are going to make the measurements/observations, e.g. once a day, twice a day. The more detailed and accurate their measurements, the more specific the prediction of the patterns will be.
5. Use the data collected to create graphs and find averages of each measure.
6. Students can also write about predictions, how they made the weather station, and the events they observed.

The grid will look something like this:

	Date	Date	Date	Date	Date	Date
Temperature						
Precipitation						
Wind Direction						
Wind Speed						
Humidity						
Pressure						
Cloud Type						

Hint: Numerical data can also be entered into a simple spreadsheet-type program, such as MS Excel or Mac OS X Numbers, and manipulated to create impressive visual charts and graphs. Students can also create a wall chart to display data.

Alternative methods for gathering data:
If the weather station is missing one or more data-collection devices, students can fill in

the blanks by either estimating wind speed using the Beaufort Wind Scale or finding the missing information in a local daily newspaper or online.

Beaufort Wind Scale to estimate wind speed

Speed	Description
Under 1	Calm; smoke rises vertically
1-3	Smoke drift shows wind direction; weather vanes remain still
4-7	Wind felt on face; leaves rustle; vanes begin to move
8-12	Leaves, small twigs moving; weather vanes start to move
13-18	Dust, leaves raised up; small branches move
19-24	Small leafy trees begin to sway
25-31	Large branches of trees moving; whistling in wires
32-38	Whole trees in motion; wind resistance felt in walking
39-46	Twigs and small branches broken off trees
47-54	Slight structural damage occurs; slate blown from roof
55-63	Rarely occurs on land; trees broken; structural damage occurs
64-72	Very rare on land; widespread damage
73+	Massive violence and destruction

Resource:
http://www.teachervision.fen.com/weather/lesson-plan/331.html?detoured=1

Standards Addressed

National

Next Gen Sunshine State
Grade 5
Grade 6
Grade 7
Grade 8