Rose Island Lighthouse Foundation Education Program – Lesson Plans

Grade Level: 3-5

Lesson Topic: Weather Station

Length: One class period for setup and then 10 minutes daily for as long as you would like to keep taking weather data.

RI Standard of Learning: Science (Physical Environment)

Learning Objective: Students will observe and describe weather; present data about weather through journals, discussions, and graphs; and make predictions by averaging.

Materials: Computer with Internet connection, thermometer, journal. Below are ideas to create other weather instruments:

- Rain Gauge http://www.miamisci.org/hurricane/rainmeasure.html
- Wind/Weather Vane – use a wind sock or small flag outside the classroom window
- Barometer – see Rose Island Lesson Plan entitled "Make A Barometer"
- Psychrometer/Hygrometer: To measure relative humidity http://www.miamisci.org/hurricane/psychrometer.html
- Rainfall Graph http://www.miamisci.org/hurricane/graph.html
- Anemometer: to measure wind speed. http://sln.fi.edu/tfi/units/energy/dixie.html

Vocabulary: weather, weather vane, barometer, psychrometer, and anemometer, thermometer

Procedure:
On Rose Island: Students will be given the chance to explore the weather data building that houses all the equipment we use for weather monitoring, and the NOAA weather station that records rainfall and temperatures. Students will also learn that some weather conditions are better for surviving on the island. For example, a windy and rainy season means lots of power and a full cistern for washing dishes or taking a shower.
In the Classroom:

- Introduction: Discuss local weather. Have students predict local weather based on their current observations. To set up the weather station, have students divide into as many groups as there are weather instruments. Have each group make one recording instrument. Decide how often students are going to make the measurements, e.g. once a day, twice a day. The more detailed and accurate their measurements, the more specific the picture of the patterns will be. A ruled ledger or notebook is an ideal place to record the observations. 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.
- Development: Use the data collected to create graphs and find averages of each measure. Students can also write about predictions, how they made the weather station, and the events they observed.
  The grid will look something like this:

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	Date	Date	Date	Date	Date	Date
Temperature						
Precipitation						
Wind Dir.						
Wind Speed						
Humidity						
Pressure						
Cloud Type						

Hint: Numerical data can also be entered into a simple spreadsheet-type program 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. You may also find information on a weather-related website. During your visit to Rose Island, everyone will receive a bookmark that describes the Beaufort scale. Here is an additional version of the scale.

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Beaufort Wind Scale to estimate wind speed

Speed MPH	Speed Knots	Scale	Designation	Description
Under 1	0-1	0	Calm	Calm; smoke rises vertically
1-3	1-3	1	Light air	Smoke drift shows wind direction; weather vanes remain still
4-7	4-6	2	Light breeze	Wind felt on face; leaves rustle; vanes begin to move
8-12	7-10	3	Gentle breeze	Leaves, small twigs moving; weather vanes start to move
13-18	11-16	4	Moderate Breeze	Dust, leaves raised up; small branches move
19-24	17-21	5	Fresh breeze	Small leafy trees begin to sway
25-31	22-27	6	Strong breeze	Large branches of trees moving; whistling in wires
32-38	28-33	7	Near gale	Whole trees in motion; wind resistance felt in walking
39-46	34-40	8	Gale	Twigs and small branches broken off trees
47-54	41-47	9	Strong gale	Slight structural damage occurs; slate blown from roof
55-63	48-55	10	Storm	Rarely occurs on land; trees broken; structural damage occurs
64-72	56-63	11	Violent Storm	Very rare on land; widespread damage
73+	64+	12	Hurricane	Massive violence and destruction

- Closure: Have students make predictions about the weather after a few weeks of recording data. Encourage students to use similar equipment at home, or to double-check the weather prediction.

Evaluation: Have students take turns recording the data for the day. Make sure they all understand all the instruments and techniques.

References: http://www.teachervision.com/lesson-plans/lesson-331.html