



Upham Woods Grab and Go: DOTS Tool-Kestrel Weather Station

Concept:

Understand how to use the Kestrel Weather Tracker as well as the difference between “weather” and “climate”.

Age level:

Grades 5th-12th

Education Standards:

MS-ESS2-5, MS-ESS3-5

Success Indicator:

Youth will be able to use Kestrel Weather Tracker to record temperature, wind chill, wind speed, maximum wind speed, and average wind speed. If recorded daily youth will be able to analyze data to make observations about their climate.

Preparation

Time: 30 minutes initially, 5-10 minutes daily afterward.

Space: Indoor and outdoor location

Materials:

- Kestrel 2000 Pocket Weather Tracker
- Pencils and paper
- Data Log

Background Information:

Technology has been integrated into virtually every facet of education. Through Digital Observation Technology Skills (DOTS) youth are able to experience and identify various aspects of nature through technology. One of the tools used to make these connections with nature is the Kestrel Weather Tracker. This tool's purpose is designed to determine the weather by measuring wind chill/speed and temperature.

Using the Kestrel Weather Tracker:

1. Turn on the Kestrel Weather Tracker by pressing the power button located in the middle under the screen.
2. The temperature measurement should be in degrees Fahrenheit, if not, press the arrows until a small °F appears.
3. Press the arrows to see the different data. They are as follows (by pressing right):
 - a. Chill (Wind chill) - Measures how cold it feels when the wind and the temperature are combined together. Measured in Fahrenheit (°F).
 - b. Wind Speed- Measured in miles per hour (mph). Hold the Kestrel perpendicular to the wind to get accurate measurement.
 - c. Max Wind Speed- Measured in miles per hour (mph), during the amount of time the device has been turned on.
 - d. Average Wind Speed- Measured in miles per hour (mph) during the amount of time the device has been turned on.
4. Make sure to tell the recorder all the information.
5. Turn off the instrument by holding the power button.

Instructions for the Activity

1. Chose one or more locations to be monitored with the Kestrel Weather Tracker (or, if preferred, allow the students to choose).
2. Split class into work groups and go over instructions for using Kestrel Weather Tracker.
3. Hand out data log and allow students to practice by making recordings indoors, along with making hypothesis.
4. Take students to designated spot(s) and have them record the information gathered by the Kestrel Weather Tracker
5. Have them experiment ways to get different readings (ex. Holding the tool up high vs down low to record wind).
6. Repeat step 5 daily for a month (or longer) and have students analyze and discuss the data (ex. Trends they might see)



Data Log Collection (units):
Hypothesized Wind Speed:
Hypothesized Air Temperature
Average Wind Speed:
Air Temperature:

Fun Facts:

Climate vs Weather

In basic terms, the difference between climate and weather has to do with the time scale. Weather is what is happening over a short period of time, while climate is how the atmosphere is acting over moderately long periods of time. To gain an understanding of the climate, we must look at the weather conditions over a time period. This time period could be a month, a year, or one hundred years. The longer the time period the more data can be gathered, so a better understanding of the climate will be accomplished. In summary, the data the students are collecting will be considered weather, while the overall trend compiled out of the data will show the trends in the climate.

Another way to look at it, is that “climate is what we expect, and weather is what we get” (Twain). Weather is what we get because it is what is happening in the short term (ex. Think of a weather report that calls for rain). Climate is what we expect because it is what tells us how the atmosphere tends to behave over longer periods of time (months, seasons, years). Climate does this based on weather’s day-to-day behavior over a standard period of 30 years.

To better understand the concept of “climate” one could look at the different kinds of climates and what they mean- Polar (very cold and dry), continental (cold and humid), Arid (Desert), Tropical (Hot and Humid), Mild (warm and humid), Mountainous (altitude affects climate)

Deeper Thinking Questions

1. What changes did you notice in your data over time?
2. Why do you think these changes occurred?
3. What other questions did you think of when using this tool?
4. What kind of job could having this tool help?
5. How would you explain the difference between weather and climate?