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Which Way Does the Wind Blow?

STORM Project

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Activity 8
Which Way Does the Wind Blow?
Level 1

Objective:

Students will be able to explain the direction the wind is blowing by observing a wind vane and applying this knowledge to the use of real time weather data about wind.

National Science Education Standards: All students should develop an understanding of: properties of objects and materials, position and motion of objects, properties of earth materials, and changes in earth and sky.

Teacher Note: The activity website can be accessed at <http://www.uni.edu/storm/activities/level1/>.

Engage:

Ask your students the following or similar questions:

1. Have you ever seen a wind vane?
2. What did it look like?
3. Draw a picture of a wind vane.

Explain that the wind vane is one of the oldest weather tools. The part of the vane that turns into the wind is shaped like an arrow. The other end is called the tail.

Explore:

Challenge your students by having them make and test a wind vane. Either make these ahead of time for the students or give them verbal directions while demonstrating what they are to do.

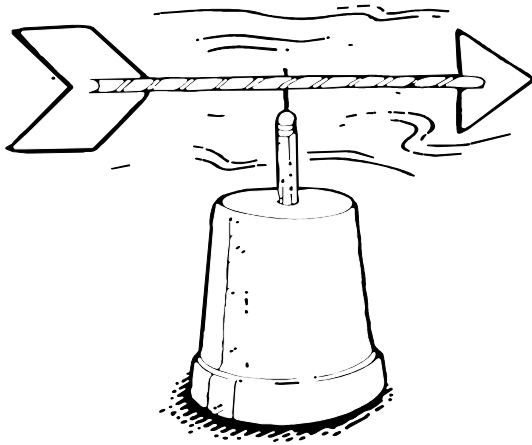
Remind the students to be careful with the pins.

1. Materials: one straight plastic soda straw, one piece of construction paper, a pencil with an eraser, one straight pin, stapler, scissors, tissue paper.
2. With a pencil, make a hole in the bottom of a paper cup. Push the pencil through the hole as shown in the picture. Cut slits about 1 cm long in each end of a straw. Push a straight pin through the center of the straw and into the eraser of the pencil so that the slits in the straw are vertical.
3. Predict whether the wind vane will work better when the tail is larger than the pointer or when the tail is smaller than the pointer.
4. Cut the pointer and the tail for your vane from 3 x 5 inch cards. Insert the pointer and tail into the slits in the straw and glue them in place.
5. Test your wind vane to see how it works. Experiment with tails and pointers of different sizes. (*Students should learn that the pointer points into the wind only when*

the tail is larger than the pointer.)

6. Share the results of the trials with the class.

Discuss the points of a compass and that the needle on a compass points to the North. The students will learn the directions North, South, East and West. The teacher will show the students a map of the United States, and locate their city and identify the four directions on the map.



Explain:

1. Access the activity website. Display the map, Station Plot-Wind/Sky Cover. Have students observe the map and ask questions about it. Likely, they will ask what the lines attached to the circles represent. Explain that the bar points to the circle from the direction the wind is blowing. Again, explain that a west wind blows from the west, and an east wind blows from the east, and so on.
2. Identify the wind direction in various towns/cities in your state. If the wind shafts have feathers/barbs on them, tell your students these tell us about wind speed and that they will learn about wind speed in another activity.
4. Print the current US Sky Cover and Winds map. *(This could be done ahead of time and copies made for students to work in groups of two or three.)*
5. Have students draw arrows on the wind barbs using the method shown below. Have them do this for the station models in their state. The arrows can be longer than the wind shaft. It is important that students understand the wind is entering that weather station from the direction of the arrow enters the circle. *(In the drawing, the arrow represents a northeast wind.)*



Extend:

1. Access the Station Plots and Fronts Map.
2. Have students look at this map and compare wind directions ahead of and behind various fronts that might be on the map.

Evaluate:

1. The teacher will observe the students responses to the questions above.
2. Collect the maps on which students drew arrows.

For Further Inquiry:

Ask students how they think wind directions will change in their area during a one-week period. Have students design an investigation to answer this or any other question they might have about wind directions.

Science Background:

Wind is simply the air in motion. Usually when we are talking about the wind it is the horizontal motion we are concerned about. If you hear a forecast of west winds of 10 to 20 mph that means the horizontal winds will be 10 to 20 mph *FROM* the west.

Although we cannot actually see the air moving we can measure its motion by the force that it applies on objects. For example, on a windy day leaves rustling or trees swaying indicate that the wind is blowing. Officially, a wind vane measures the wind direction and an anemometer measures the wind speed.

The vertical component of the wind is typically very small (except in thunderstorm updrafts and downdrafts) compared to the horizontal component, but is very important for determining the day-to-day weather. Rising air will cool, often to saturation, and can lead to clouds and precipitation. Sinking air warms, causing evaporation of clouds and, thus, fair weather.