

Everyone Knows It's Windy

Science Standard II:

Students will understand that the elements of weather can be observed, measured, and recorded to make predictions and determine simple weather patterns.

Objective 1:

Observe, measure, and record the basic elements of weather.

Intended Learning Outcomes:

1. Use Science Process and Thinking Skills.
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning.

Content Connections:

Art IV-3; Writing VIII-6

Science Standard II

Objective 1

Connections

Background Information

Wind is one of the elements of weather. It is the movement of air that can be felt against our faces and bodies. We can see the effect of wind by the movement of objects. The direction, temperature, and speed of wind can help us predict changes in the weather.

Wind is the result of pressure differences in the atmosphere. This is why the weather people on TV care so much about high and low pressure systems.

A *wind vane* is an instrument that tells the direction the wind is moving.

Along with wind direction, meteorologists measure wind speed. *Wind speed* is a measure of how fast the air is moving. It is measured using an instrument called an anemometer. As the spinning cups of an anemometer turn, the speed of the wind is determined. Knowing wind speed and air pressure helps meteorologists forecast when an approaching storm will arrive or how long the weather in an area will remain.

Invitation to Learn

Read a riddle or a poem about the wind. (Example: This was the second riddle that Gollum asked Bilbo Baggins in *The Hobbit*. "Voiceless it cries, Wingless flutters, Toothless bites, Mouthless mutters." If he doesn't know the answer Gollum will eat him. The answer is "the wind.")

Instructional Procedures

Materials

- Five 3 ounce paper Dixie cups
- Two straight plastic soda straws
- Pin
- Scissors
- Paper punch
- Small stapler
- Sharp pencil with an eraser

1. Using the paper punch, punch one hole in each of four Dixie cups, about a half inch below the rim.
2. Take the fifth cup. Punch four equally spaced holes about a quarter inch below the rim. Then punch a hole in the center of the bottom of the cup.
3. Push a soda straw through the hole of one cup. Fold the end of the straw, and staple it to the side of the cup across from the hole. Repeat this procedure for another one-hole cup and the second straw.
4. Now slide one cup and straw assembly through two opposite holes in the cup with four holes. Push another one-hole cup onto the end of the straw just pushed through the four-hole cup. Bend the straw and staple it to the one-hole cup, making certain that the cup faces in the opposite direction from the first cup. Repeat this procedure using the other cup and straw assembly and the remaining one-hole cup.
5. Align the four cups so that their open ends face in the same direction (clockwise or counterclockwise) around the center cup. Push the straight pin through the two straws where they intersect. Push the eraser end of the pencil through the bottom hole in the center cup. Push the pin into the end of the pencil eraser as far as it will go. Mark one of the four cups with an "X" so you can count how many times it goes around in one minute. Your anemometer is ready to use.

Your anemometer is useful because it rotates with the wind. Try taking it somewhere that is windy so you can watch it spin. A fan can be used indoors if it is not windy enough outside to see if it works. Count how many revolutions it makes in one minute. Record your observations in your science journal. Include a description of how an anemometer works and is used by weather forecasters.



Possible Extensions/Adaptations/Integration

- Assist students with limitations in the construction of their anemometers.
- Research the effects of severe windstorms on people and property.

Assessment Suggestion

- Check to see if the anemometer works when placed in a windy location.
- Check journal entry describing how an anemometer works and is used by weather forecasters.
- Compare the rate the anemometer revolves with the daily change in weather over a period of time.

Additional Resources

Students can bring in newspapers with daily weather maps and forecasts. They can also check weather Web sites for current wind readings and forecasts.

Check school and local libraries for books on weather.

Check district media centers for videos about weather. There are also commercial weather videos available.

Utah's Weather Guide, by Dan Pope and Clayton Brough (1997
News4Utah)

USU Water Quality Extension

http://extension.usu.edu/waterquality/kids_page.htm

Water Science for Schools

<http://ga.water.usgs.gov/edu/>

Family Connections

Students with Internet connections at home can be asked to visit weather Web sites. They can also be assigned to watch the evening weather forecast on one of the television news channels. They could demonstrate information about wind as part of a school science fair. Some families may want to purchase an anemometer for home use.