Measuring Wind Speed

Summary

Using a ping pong and protractor, students measure wind speed over the course of a week and graph the results.

Time Frame

5 class periods of 15 minutes each

Group Size

Pairs

Materials

For the each pair of students:

- 10 inches of string
- Protractor
- Ping pong ball

Background for Teachers

Wind occurs when the flow of air over the Earth's surface is unevenly heated. Warm air expands, becoming lighter. When this happens, the air rises. As the warm air rises, cooler air rushes in to fill the space left by the rising warm air. This movement is called convection. Wind speed can be measured with an anemometer. At higher elevations, the air gets thinner and there is less air pressure. This reduction in air pressure reduces frictional drag and wind speed increases. The rotation of the Earth also affects wind. There are six major wind belts around the Earth (easterlies, westerlies, and trade winds in both the northern and southern hemispheres) that form by convection.

Intended Learning Outcomes

- Use instruments to measure.
- Record data accurately.

Instructional Procedures

- Give each pair of students a ping pong ball, string, and piece of tape.
- Instruct the students to tape the string to the ping pong ball and tie the string to the center of the straight edge of the protractor.
- Hold the protractor upside down so the string hangs past the 90 degree mark.
- Hold the device in the wind. The wind will blow the ping pong ball and students can measure wind speed by using the following scale:
  - 90 degrees = 0 mph
  - 83 degrees = 6 mph
  - 75 degrees = 10 mph
  - 61 degrees = 15 mph
  - 50 degrees = 18 mph
  - 45 degrees = 19.5 mph
  - 35 degrees = 23.5 mph
  - 20 degrees = 32.5 mph
- Record wind speed at the same time each day for one week and graph results. At the same time as the students record the wind speed, have them record the visible weather conditions, i.e.

clear or cloudy, approximate temperature, raining or not. If there are clouds, have them identify the types of clouds.
At the end of the week discuss the results as a class. Look for patterns and relationships.

Assessment Plan

Ask the students to write a description of how they measured the wind.
Set a fan on low in the room. Individually, give each student a turn to measure the "wind speed" of the fan using a ping pong ball and a protractor.

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