Name _____ Date _____

Student Worksheet
Activity 3.1.2, Making Simple Weather Instruments
Anemometer

OBJECTIVES

To build simple a weather instruments relying on the same principles found in professional meteorologists' instruments.
To observe how weather instruments work.
To relate how and why these instruments work to fundamental scientific principles, i.e. air in motion exerts a force which can be used to measure wind speed.
To compare the accuracy of hand-made instruments with actual weather instruments

MATERIALS (for each student or team of students)

- 4 disposable 3 oz. cups (identical sizes)
- pencil with an eraser
- 2 straws
- straight pin
- glue or staples
- marker or use a cup that is obviously different from the others (in color not shape)
- stopwatch
- anemometer or current wind speed using the Internet
- WEATHERLog

PROCEDURE

1. Cross the two straws so that they form an X and staple them in the middle.
2. Staple one of the cups to the each end of the straws. The cups should be placed sideways to the straw and all face in the same direction. Mark one cup with a marker that will be clearly visible as it is spinning. You need this as a reference point for your measurements.
3. Place the pin through the center of the straws and secure it to the eraser of the pencil.
4. Take your "anemometer" outside. Go to an open area away from the building to record your measurements.
5. Point your anemometer into the wind and count the number of times the marked cup passes in one minute.
6. To find the wind speed you need to calculate the circumference ($C=\pi d$ where d is the length of the straw and π is 3.14) of the circle in feet made by the rotating cups. Multiply the number of revolutions your anemometer made by the circumference of the circle. This will give you the wind speed in feet per minute. You can then convert this into the speed of the wind in miles per hour.
7. In your WEATHERLog draw a picture of your anemometer. Use a professional anemometer to find the current wind speed or look it up on the Internet. Record both measurements and the date in your WEATHERLog.
8. Continue to take readings using your anemometer and compare them to the current data over the next few days. Record the date and any observations you made while taking your data.

OBSERVATIONS
Record your daily measurements. Include the current wind speed, the wind speed using your anemometer and the date.

CONCLUSIONS
At the end of the week or the period of time in which you will be taking your measurements write a summary paragraph or two explaining how the accuracy of your anemometer compared to the accuracy of a professional anemometer, or local wind speeds found on the Internet. Include any problems you found using your instrument.

http://www.schools.ash.org.au/paa/instruments.htm#anemometer
Project Atmosphere Australia

http://sln.fi.edu/tfi/units/energy/dixie.html
Franklin Institute: "Windy" Things To Make

http://www.allstar.fiu.edu/aero/Experiment10.htm
Aeronautics

Wind Vane:
http://sln.fi.edu/weather/todo/vane.html
The Franklin Institute: Franklin's Forecast

http://www.schools.ash.org.au/paa/instruments.htm#wvane
Project Atmosphere Australia

http://www.allstar.fiu.edu/aero/Experiment11.htm
Aeronautics

Wind Sock:
http://www.schools.ash.org.au/paa/instruments.htm#windsock
Project Atmosphere Australia

http://www.allstar.fiu.edu/aero/Experiment13.htm
Aeronautics