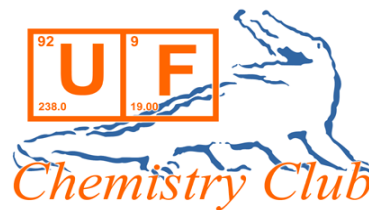


University of Florida Chemistry Outreach Program

Make an Anemometer



Estimated Time: 30 mins. + 15 mins. clean-up

Topics: Weather

Introduction: Can you see the wind? No one can, but we can all measure wind speeds using an anemometer. This tool measures speed and force of the wind. The direction of the wind does not matter. To measure the speed of the wind you will need to obtain the revolutions per minute (RPM) and the circumference of the anemometer.

Objective: The purpose of this lab is to enhance students' understanding of wind and speed. It is also good practice for multiplying and employing mathematical formulas.

Materials:

-5- 3oz. paper Dixie Cups	-Stapler
-2- soda straws	-Rulers
-Pin	-Timers
-Paper punch	-Sharp pencil with an eraser
-Scissors	

Safety: -Remind students there is NO eating or drinking in the lab.

Procedure:

1. Take four of the Dixie Cups and use the paper punch to punch one hole in each, about a half inch below the rim.
2. Take the fifth cup and 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. Take one of the four cups and push a soda straw through the hole. 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. 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.
5. Bend the straw and staple it to the one-hole cup, making certain that the cup faces the opposite direction from the first cup. Repeat this procedure using the other cup and straw assembly and the remaining one-hole cup.
6. Align the four cups so that their open end face in the same direction either clockwise or counter-clockwise around the center cup.
7. Push the straight pin through the two straws where they intersect.
8. 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.
9. Position the anemometer outside in an unobstructed area.
10. Measure the anemometer's RPM and velocity according to the instructions in the discussion (below).

Discussion:

1. What is the anemometer's RPM?
To measure the RPM, the student first must determine the number of revolutions the anemometer spins for one minute.
2. What is the circumference of the anemometer?
The formula for circumference is $C=2\pi r$. Remember all units must be in feet.
3. How can I find the velocity of the wind according to the anemometer?

The formula for velocity of wind according to the anemometer is $V=C \times \text{RPM}$

4. What units does the velocity have?

Velocity is distance per time, so the units will be feet per second.

An anemometer is useful because it rotates with the wind. To calculate the velocity at which your anemometer spins, determine the number of revolutions per minute (RPM). Next, calculate the circumference (in feet) of the circle made by the rotating paper cups. Multiply your RPM value by the circumference of the circle and you will have an approximation of the velocity of at which your anemometer spins (in feet per minute). Your anemometer doesn't need to be pointed in the wind for use.

Source: This lab is a modified version of a similar activity from NyeLabs.com