

Make an Anemometer



You will need:

- five paper cups
- two straight plastic straws
- a pin
- scissors
- a hole punch
- a small stapler
- a sharp pencil with an eraser

Procedure

Take four of the paper cups. Using the hole punch, punch one hole in each, about 1.5 cm below the rim.

Take the fifth cup. Punch four equally spaced holes about 1cm below the rim. Then punch a hole in the centre of the bottom of the cup.

Take one of the four cups and push a 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.

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.

Align the four cups so that their open ends face in the same direction (clockwise or anticlockwise) around the centre 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 centre cup. Push the pin into the end of the pencil eraser as far as it will go. Your anemometer is ready to use.

Your anemometer is useful because it rotates at the same speed as the wind. This instrument is quite helpful in accurately determining wind speeds because it gives a direct measure of the speed of the wind. To find the wind speed, determine the number of revolutions per minute. Next calculate the circumference of the circle (in metres) made by the rotating paper cups. Multiply the revolutions per minute by the circumference of the circle (in metres per revolution), and you will have the velocity of the wind in metres per minute.

The anemometer is an example of a vertical-axis wind collector. It need not be pointed into the wind to spin.

Make a Protractor Anemometer

This protractor anemometer is simple to make using materials you have at home or school. You can then use it to measure the speed or velocity of the wind.



Materials

You will need:

- strong thread or thin fishing line - about 30 cm long
- a ping-pong ball
- a protractor
- glue and sellotape
- thick cardboard (for mounting the protractor)
- angle/wind speed conversion chart (given below)



Procedure

Using some sellotape, mount the protractor to the cardboard with the curved side pointing downwards.

Write or print out the wind speed conversion chart that is shown below. Stick this onto the cardboard as well.

Tape or glue the thread to the ping-pong ball.

Tie or glue the other end of the thread to the centre of the protractor.

Your protractor anemometer is now ready to be used. Hold the cardboard in the direction that the wind is blowing. The wind will blow the ping-pong ball and move the thread off centre. When it does this read the angle on the protractor.

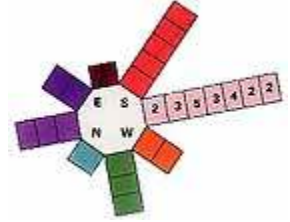
Convert this angle to the wind velocity using the chart as shown below.

String angle	90	80	70	60	50	40	30	20
Speed (kph)	0	13	19	24	29	34	41	52




Draw a Wind Rose

Having made an [anemometer](#) and a [wind vane](#), you can now make measurements of both wind speed and direction. However, you need something to record these measurements on. So let's make a wind rose - a chart that is used to plot wind records.

Each day, colour in one square that points in the direction the wind is blowing from. Work out the wind speed using the [Beaufort scale](#) and your anemometer readings. You should end up with a chart like the one shown. Write the wind speed in the squares.



<i>Force</i>	<i>Symbol</i>	<i>Name</i>	<i>Description</i>	<i>Approximate Speed (mph)</i>	<i>Image</i>
<i>Force 0</i>		Complete calm	No motion. Smoke rises straight up	<1	
<i>Force 1</i>		Light air	Smoke drifts	1-3	
<i>Force 2</i>		Light breeze	Wind felt on face. Leaves rustle. Weather is usually clear	4-7	
<i>Force 3</i>		Gentle breeze	Leaves and twigs move. Light flags flap	8-12	
<i>Force 4</i>		Moderate breeze	Small branches move	13-18	
<i>Force 5</i>		Fresh breeze	Bushes and small trees sway. Crests are common on sea and known as "white horses"	19-24	
<i>Force 6</i>		Strong breeze	Wind whistles in electricity and telephone wires. Hard to use umbrellas	25-31	
<i>Force 7</i>		Near gale	Whole trees sway and it becomes hard to walk in the wind. Sky may be dark and stormy	32-38	
<i>Force 8</i>		Gale	Now very difficult to walk and tree twigs start to break	39-46	
<i>Force 9</i>		Strong gale	Tiles and chimneys blown from roofs and branches may snap. Sky may be covered in thick cloud	47-54	
<i>Force 10</i>		Storm	Trees are uprooted and severe damage	55-63	

			is caused to buildings		
<i>Force 11</i>		Violent storm	Widespread damage is caused to buildings	64-72	
<i>Force 12</i>		Hurricane	Severe devastation is caused	73+	