



## SCIENCE PROJECTS

### Make an Anemometer!

Measure how fast the wind blows.

An anemometer is a device that tells you how fast the wind is blowing. The device you can build is a model of a wind speed indicator. A real one will be able to accurately measure how fast the wind is blowing. Yours will give you only approximation of how fast it's blowing. It can't give you an exact wind speed.

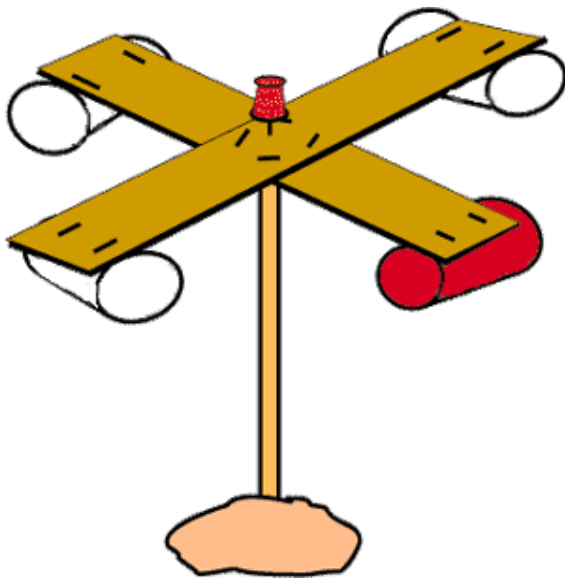
The energy in the moving wind can be used to generate electricity. But you have to know how fast the wind is blowing before you can harness wind power.

### What do you need?

1. Scissors
2. 4 small paper cups (like drinking cups)
3. A marking pen (any color)
4. 2 strips of stiff, corrugated cardboard -- the same length
5. Ruler
6. Stapler
7. Push pin
8. Sharpened pencil with eraser on the end
9. Modeling clay
10. A watch that shows seconds

### What to do?

- 1** Cut off the rolled edges of the paper cups to make them lighter.
- 2** Color the outside of one cup with the marking pen.
- 3** Cross the cardboard strips so they make a plus (+) sign. Staple them together.
- 4** Take the ruler and pencil and draw lines from the outside corners of where the cardboard strips come together to the opposite corners. Where the pencil lines cross will be the exact middle of the cross.



**5** Staple the cups to the ends of the cardboard strips; make sure the cups all face the same direction.

**6** Push the pin through the center of the cardboard (where the pencil lines cross) and attach the cardboard cross with the cups on it to the eraser point of the pencil. Blow on the cups to make sure the cardboard spins around freely on the pin.

**7** Place the modeling clay on a surface outside, such as a porch railing, wooden fence rail, a wall or a rock. Stick the sharpened end of the pencil into the clay so it stands up straight.

## What you'll discover!

### Measuring Wind Speed

This anemometer cannot tell the wind speed in miles per hour, but it can give you an idea of how fast the wind is blowing.

Using your watch, count the number of times the colored cup spins around in one minute. You are measuring the wind speed in revolutions (turns) per minute. Weather forecasters' anemometers convert the revolutions per minute into miles per hour (or kilometers per hour). Keep a record of the wind speeds you're measuring for the next few days.

Measure the wind speed at different times of the day. Is it the same in the morning; the afternoon; the evening? Move your anemometer to another location. Is it windier in other places? Do trees or buildings block the wind?

**One of our readers, Heather Fluehr, and her mom, Paulina, of Apopka, Florida, devised a clever way to measure wind speed in miles per hour. With a slightly different anemometer, the whole family got into the car. One person drove the car, one held the anemometer out of the window -- these two were adults -- one held a stop watch, and one counted the revolutions of the anemometer. They drove exactly 10 mph. In one minute their anemometer made 100 revolutions. Assuming there was no wind that day, they determined that with their anemometer 100 rpms equals 10 miles per hour. If they wanted to they could verify the accuracy of their measurements by using a real anemometer like the ones used by weather forecasters and airports.**

Wind speed is important for wind energy. Wind turbines -- which are the machines that change the movement of the wind into electricity -- need a constant, average wind speed of about 14 miles per hour before the wind turbines can generate electricity. That's why wind farms, where there are a lot of wind turbines grouped together, are located in windy spots. In California, these are in three main places -- the Altamont Pass east of San Francisco, Tehachapi south of Bakersfield, and in San Geronio near

Palm Springs.

To read more about wind energy, please see Chapter 10 of our [Energy Story](#).

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