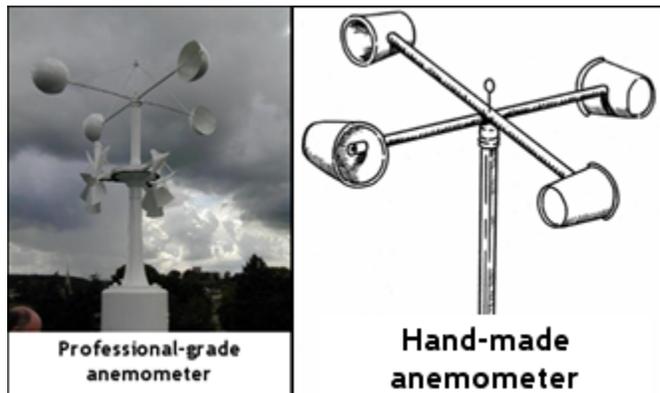


Make Your Own Anemometer

An anemometer is an instrument that meteorologists use to measure wind speed. One type of anemometer consists of four arms with cups on the ends that rotate freely. Wind from any direction will catch one of the cups and start the rotation of the arms. The faster the wind is blowing, the faster the arms will spin. To measure the wind speed, count the number of times the anemometer makes one complete rotation in 30 seconds. Multiply this number by 2, to get the wind speed in rotations per minute (rpm).

MATERIALS:

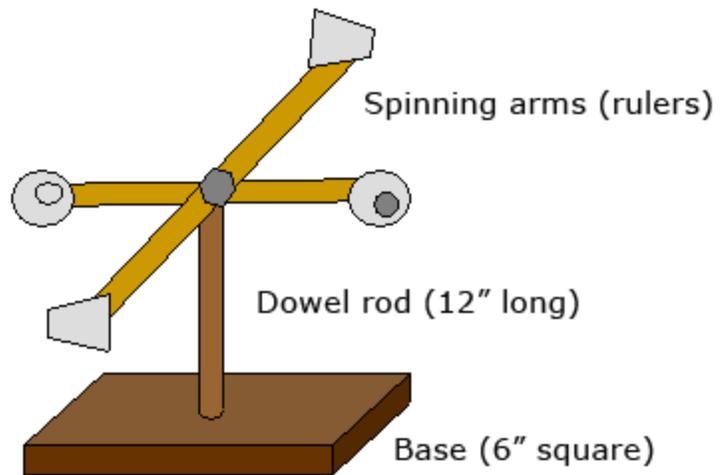
- 4 paper cups of equal size and shape (rotating cups)
- 1 piece of wood, 15 cm square (or 6 inches) (base of instrument)
- 1 12" long large dowel rod
- two wooden 12" rulers (with a hole in the center), or 12" strips of wood and drill a hole in the center of each (arms of instrument)
- glue
- 2 nails
- 1 washer
- 8 thumb tacks
- tape
- hammer
- red marker or red paint
- stopwatch or clock with a seconds hand



PROCEDURE:

1. Nail the wood square to the 12" dowel rod
2. Glue two wooden rulers together at their centers. The rulers should be glued at a 90° angle to one another. Make sure the holes line up with room to place a nail through them.
3. Place a washer between the dowel rod and the rulers and attach the cross to the dowel rod using the remaining nail. The nail should go through the hole in the rulers.

4. Use two thumb tacks per cup and attach a paper cup to each end of both rulers.
5. Use a red marker or red paint and put a large X on one of the cups.
6. Take your anemometer outside and measure the wind speed. To do so, count the number of times the cup with the red mark passes in front of you in 30 seconds. Multiply by two to get revolutions/rotations per minute (rpm).



OBSERVATIONS:

1. What was the wind speed?
2. If the number of turns made in 30 seconds was 15, what would the wind speed be?
3. What would the wind speed be if the anemometer made 40 turns in 30 seconds?



CONCLUSIONS:

1. How does the structure of an anemometer allow you to measure wind speed?
2. How might your anemometer be less accurate than the ones that weather forecasters (meteorologists) use?
3. Are there any structural design flaws that might have decreased the accuracy of the anemometer you built?
4. How big does an anemometer have to be to measure wind speed? If you made a bigger anemometer, would the wind speed you measured change? If you made a smaller anemometer, would the wind speed you measured change?

Source: https://secoora.org/make_anemometer/