

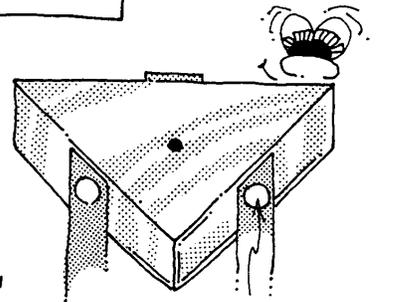
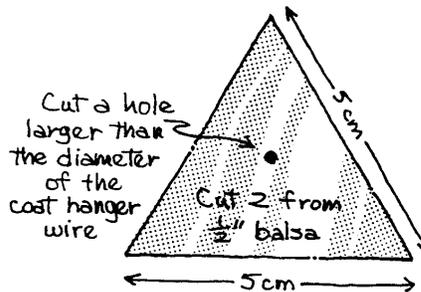
# HOW MUCH WIND IS NEEDED TO TURN A MODERN WIND MACHINE ?



## MATERIALS:

- 1 balsa wood dowel, 3/16" x 35.5cm
- 2 coat hangers; 6 thumbtacks
- 3 pieces construction paper, 35.5cm x 1.25cm
- 3 corks; drill; glue; 4 wooden spools ← ask anyone who sews!
- 1 piece 1/2" balsa, 5cm x 10cm
- 1 empty 1 lb. salt box; tape
- Teacher's discretion → Hobby knife; 1 sheet balsa, 1/6" thick
- Magic marker, any color

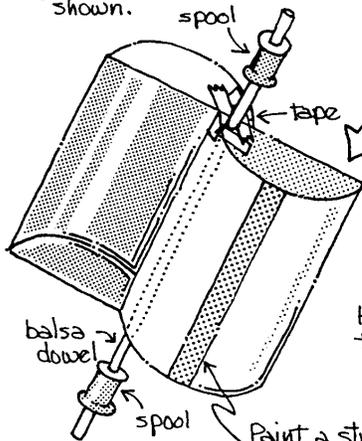
Make these 3 modern wind machines.



attach the 3 paper strips with thumbtacks

## Helix Rotor

Cut salt box in half; tape together as shown.

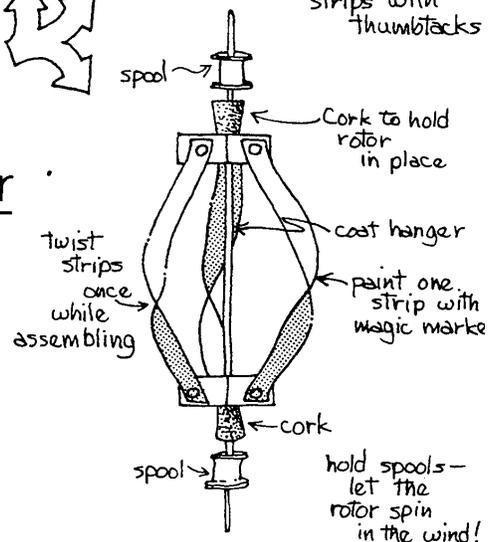


## Savonius Rotor

Punch holes and insert balsa dowel.

Hold spools - let the rotor spin in the wind!

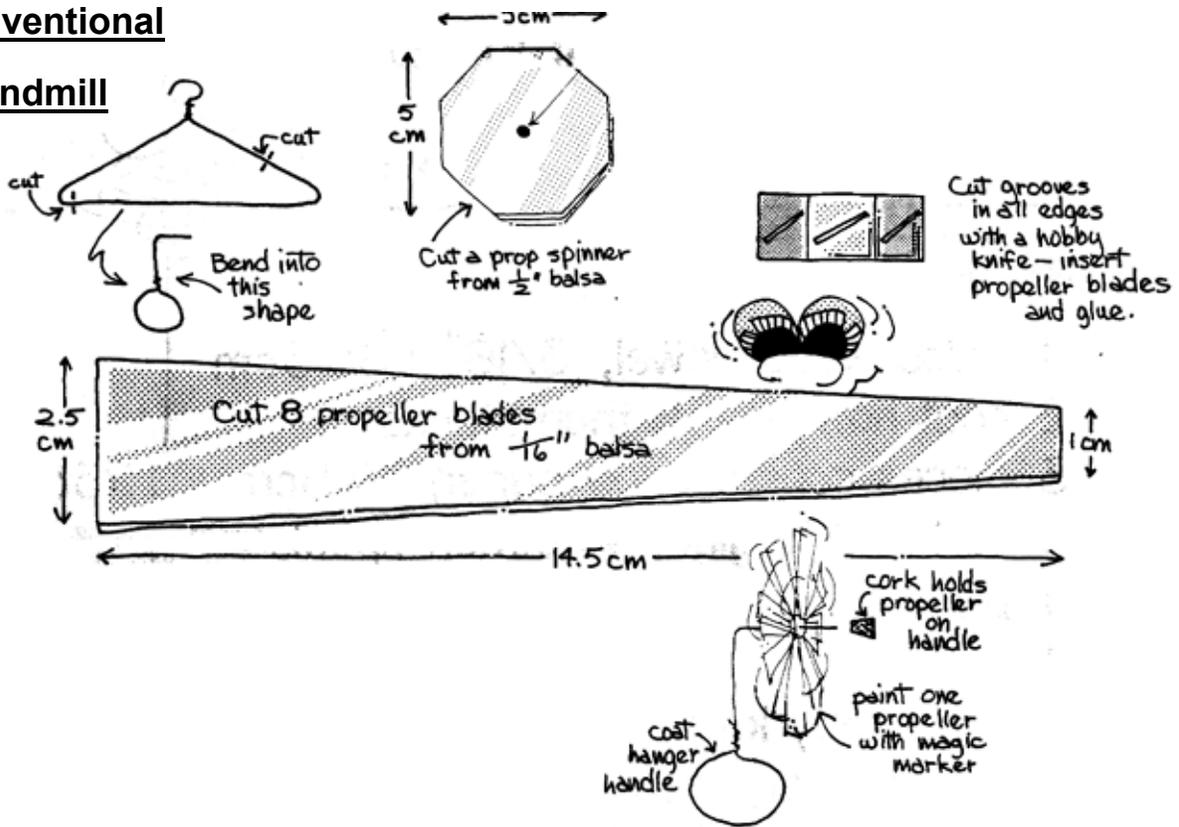
Paint a stripe of color here with a magic marker



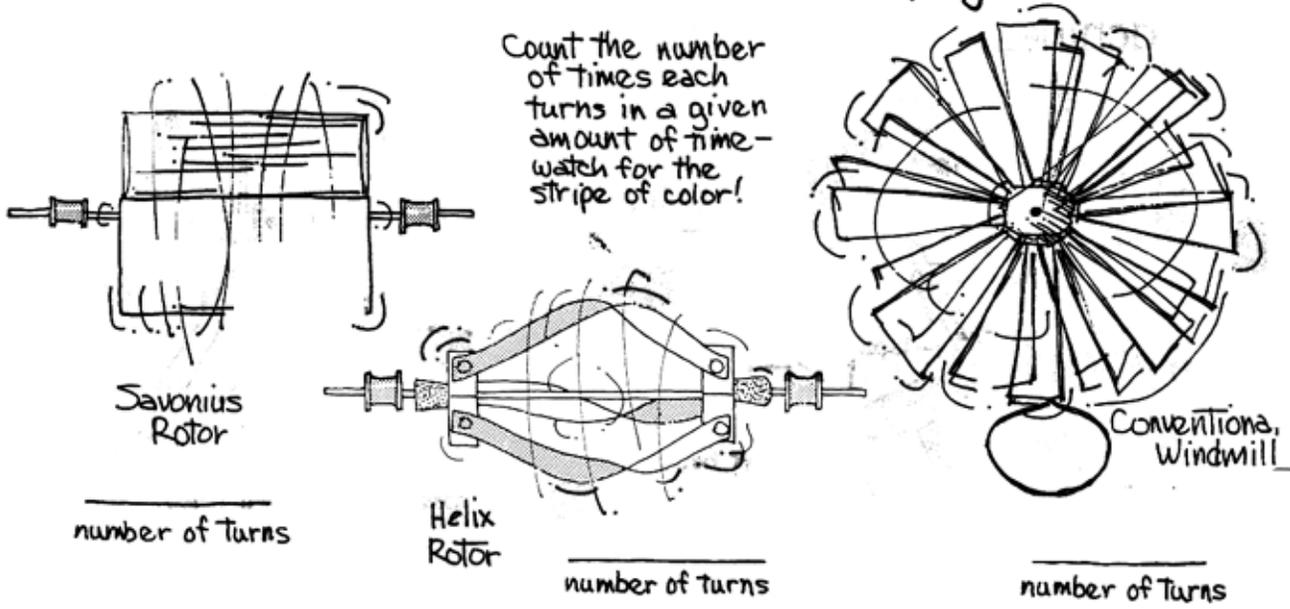
hold spools - let the rotor spin in the wind!

Conventional

Windmill



Face each of the wind machines into the wind. Use a wind measuring device to calibrate the wind speed. (See next page.)



Which wind machine turns with the least wind?

# How can you measure wind energy?

Some places have a lot of wind and others don't. For example, places that are higher or more open usually have stronger winds. Before you bought or built a windmill, you would want to be sure that your location had enough wind. But how can you measure the wind?

An anemometer is used to measure wind energy. You sometimes see them at airports.

You are going to make a simple anemometer and measure the wind energy around your school.

## Materials for each anemometer:

pencil, pin, two soda straws, stapler, scissors, cone pattern, paper, tape, bottle with a narrow neck, stopwatch or watch with a second hand.

## Steps

1. Staple 2 straws so they make an X. Reinforce with tape.
2. Cut out patterns for 4 cones. Color one cone red.
3. Staple one cone pattern to each straw end, so they all face the same way.
4. Curve each cone pattern to form a cone, and tape.
5. Pin the center of the X to the pencil eraser.
6. Insert the pencil in a narrow necked bottle, so that you can hold the bottle and the anemometer will spin freely.

