Related Standards:

3-ESS2-1
7-MS-ESS2-5

Wind: *Pinwheel*

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Engineers and Wind

Engineers design **wind turbines** to produce electricity from the force of wind. Natural forces like sun, wind, rivers, and organic matter, are considered **renewable resources** and can be used to obtain energy. Turbines resemble pinwheels, but a turbine has several other parts such as gears, generators, and brakes.

Materials:

- ❑ Scissors
- ❑ Pencil/Straw
- ❑ Push Pin
- ❑ Paper (cut into a square)
- ❑ Ruler
- ❑ Tape

Instructions:

1. Using a ruler, put a dot in the center of your paper
2. Use your ruler to draw a diagonal line from each corner of the paper halfway to the dot in the center.
3. Next, use your scissors to cut the diagonal line.
4. Fold alternating points (every other point) into the center dot and put a pushpin through. Make sure to hold them tight.
5. Hold the pushpin with gathered points in one hand tightly and use your other hand to push the remainder of the pin through a straw/pencil. Once your pushpin is through the straw, use a little bit of masking tape to make sure no fingers get stuck by the pin.

What's the science behind it?

Most pinwheels have the blades arranged so that when wind blows straight at them, they spin counterclockwise. This is because the blades' "cups" are made so that the oncoming air is captured and pushes the blades in this direction. When wind is blown into the cups, the pinwheel spins well.

Related Standards:

3-ESS2-1
7-MS-ESS2-5

Wind: *The Power of Wind*

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Anemometer

A cup anemometer is commonly called a Robinson anemometer It uses cup-like shapes to capture the wind, which will cause the system to spin.

Materials:

- ❑ 2 straws
- ❑ 5 small paper cups
- ❑ Stapler or tape
- ❑ Pencil with eraser
- ❑ Push pin
- ❑ Recycled plastic container lid
- ❑ Heavy weight object (rock/sand/clay)
- ❑ Hole punch
- ❑ Fan or wind source

Instructions:

1. With a hole punch, punch a hole about a centimeter down from the rim in 4 of the cups
2. In the 5th cup, punch 4 evenly spaced holes about a centimeter down from the rim and make a small hole in the bottom center of this cup.This will be the center of the anemometer.
3. In the center of the plastic container make a small hole
4. Push a pencil through the center hole of the 5th cup and the plastic cover of the container
5. Slide one of the straws through the hole in one of the 4 cups that has only one hole in it. Bend the end of the straw that is inside the cup and tape or staple it to the inside of the cup.
6. Place the other end of the straw through two of the holes in the 5th cup. Then through the hole in one of the other cups. Tape or staple the end of the straw to the inside of the cup.
7. Repeat the last 2 steps with the remaining cups

What's the science behind it?

An anemometer is an instrument used to measure wind velocity. There are several different anemometer types that are ideal for various conditions, circumstances, and measurements. A cup anemometer is a basic type of measuring device whereas newer, more precise anemometers can use lasers and ultrasonic measuring technology