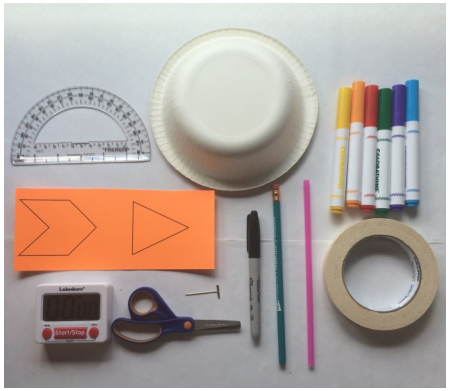
Wind Vane

Can you engineer a straw, a bowl and an arrow that will help you determine wind direction?

MATERIALS



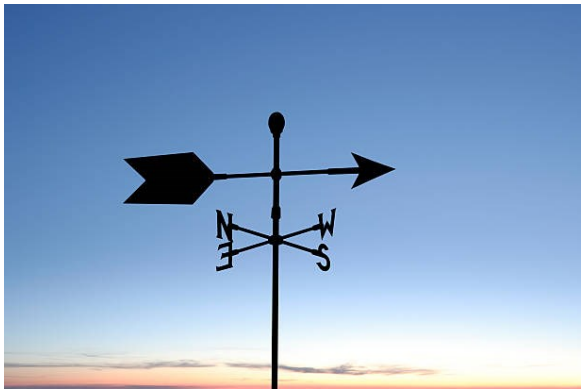
- Dixie Bowls
- Wind Vane Template
- Straw
- Pencil
- T– Pin
- Markers
- Sharpie
- Scissors
- Masking tape
- Ruler

GET SET UP

1. Decorate the bottom of a paper bowl using markers. This will be your wind vane's base. Use a marker to write N, E, S, and W on each side of the paper plate. This will stand for North, East, South and West. These are the four cardinal directions. To know the correct order to put them in remember the acrostic **N**ever **E**at **S**hredded **W**heat.
2. Decorate and cut out the wind vane template. Cut two one-inch pieces of tape. Tape the triangle horizontally to one end of the straw. Tape the end of the arrow on the opposite end of the straw.
3. Find the center of the bottom of the bowl. To be accurate, use your protractor and measure 2 1/4 of an inch from the edge and make a mark. Push the pencil through the center mark and leave it snuggly in place (the eraser should be sticking out). Set this aside.
4. Take a T-pin and push it through the center of the straw. Then push the T-pin into the pencil eraser on the base. The wind vane should now be balanced above the base and able to spin freely.
5. Gently blow towards the arrow on your wind vane. Does it spin freely? If your wind vane does not spin freely, loosen the arrow by pushing the T-pin up slightly. Take the weather vane outside and discover which way the wind is blowing. Does your wind vane work? What does it tell you? To find out the correct direction of the wind, the 'N' on your vane needs to point North. Then look at your vane. What direction is the wind blowing?

DID YOU KNOW...

Wind vanes are weather tools that tell us which direction the wind is blowing. Wind vanes have an arrow that sits on a center axis where weight is evenly distributed. This helps the vane have a balanced rotation when the wind blows. What would happen if one side of the vane was heavier than the other? Would it be accurate? The two ends of the arrow are different. One end has a smaller surface area and the other has a larger surface area. When the wind blows, the side with the larger surface area is pushed away from the direction of the wind. This will make the arrow's point (with the smaller surface area) face the direction of the wind. If the wind is blowing from the north, the arrow will point towards the northern direction. If it came from the west, then the arrow would point west. Wind vanes work best if they are placed at a high point. If it's too close to the ground, obstacles like trees or buildings will affect wind flow. Many wind vanes are decorative but you will also see them at airports and on sailboats to keep track of wind direction.



(Optional) For young scientists ages 4-6
The biggest challenge your young scientists will face is pushing the T-pin into the eraser. Pair them up with an older student to offer the assistance they need. They might also need help writing the directions correctly. Have a template ready so they can follow your example.

CHALLENGE

1. Think about the glider and helicopter you made why is wind strength and direction important things to know when operating flying machines?
2. Which variables affect a proper read in wind direction?
3. What is wind energy used for? Is it a renewable energy?

STEAM Challenge: The highest wind speed ever recorded is 231 mph (miles per hour). The length of the United States is 2, 680 miles. How many hours would it take for the wind to travel the length of the United States? Russia is 6, 000 miles? How many hours would it take the wind to travel across Russia.