



How To Build an Anemometer

You Will Need:

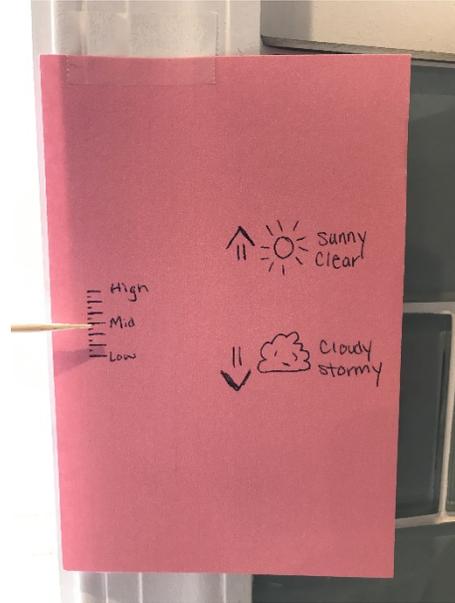
- Pencil w/eraser
- Six (6) small paper cups
- Modeling clay
- Pin/pushpin
- Tape
- Two (2) long straws
- Marker
- Paper plate



Instructions:

1. Tape one small paper cup upside down on the bottom of the paper plate;
2. Poke sharpened pencil through the bottom of the paper cup and tape into place;
3. Using the marker, color one of the paper cups;
4. Poke holes into the sides of four (4) paper cups (the colored cup and 3 blank cups). Try to put the hole in the same place on each cup;
5. Into the remaining paper cup, poke one (1) hole on each side, evenly spaced AND one (1) hole on the bottom;
 - a. Into this cup, put a straw through each set of opposing holes, creating an X in the center of the cup
6. Put one cup on each end of the straws, taping in place sideways, all facing the same direction
7. Put the pencil through the hole you poked in the bottom of the main cup;
8. Carefully push the pin through the center of the straw X and into the pencil eraser;
9. The straw should now rotate freely;
10. Tape your anemometer to the ground or table outside
11. Observe the wind speed by counting how many times the colored cup goes around in one (1) minute
12. Be sure to bring your anemometer inside when you're not observing wind speed!

How To Build a Barometer



You Will Need:

- Wide mouth glass jar
- Balloon
- Rubber bands
- Chopstick or Skewer
- Tape
- Index card
- Marker
- Scissors

Instructions:

1. Cut the neck off a balloon
2. Stretch balloon tightly over the opening of the jar and secure in place with several rubber bands
3. Tape the wide end of a chop stick or skewer to the center of the balloon
4. On the index card, mark equally spaced lines to create a scale
5. Tape the index card to the wall next to your barometer so that the chopstick or skewer points directly to the middle
6. Check back occasionally to see if the pressure has changes.
 - a. When pressure is high, the chopstick/skewer will point to above the center line. It is likely sunny and clear outside.
 - b. When pressure is low, the chopstick/skewer will point below the center line. It is likely cloudy/stormy outside.



How To Build a Rain Gauge

You Will Need:

- 1 or 2-liter soft drink bottle (emptied and cleaned)
- Weights - pebbles/small rocks/glass beads
- Permanent marker
- Tape
- Scissors
- A ruler
- Water



Instructions:

1. Cut the top off the bottle (have an adult help);
 - a. Cover the cut edge with tape, it can be sharp!
2. Mark a thick, level line a few inches from the bottom of the bottle;
3. Use the ruler and marker to make a scale up from the thick line (1", 2", 3", and so on; include smaller dashes to show $\frac{1}{4}$ in, $\frac{1}{2}$ in, and $\frac{3}{4}$ in);
 - a. Be careful not to get permanent marker on your skin, clothes, or anything else you don't want permanently marked!
4. Place some weights in the bottom of the bottle, up to but not past the 0" line;
5. Pour water into the bottle until it reaches the thick line where the scale starts;
6. Turn the top upside down and place into the bottom, taping in place;
7. Put your rain gauge outside where it can collect water when it rains;
8. After a shower has finished, or at the end of the day, check to see how far up the scale the water has risen;
9. Empty the water and repeat from step 6 for the next shower.



How To Build a Bottle Thermometer

You Will Need:

- Tall bottle (glass or plastic)
- Food coloring drops
- Clear drinking straw
- Modeling clay
- ½ cup Isopropyl (Rubbing) Alcohol
- ½ cup Water (room temperature)



Instructions:

1. Pour ½ cup water into bottle
2. Pour ½ cup rubbing alcohol into bottle (have a parent help!)
3. Add a few drops of food coloring
4. Mix it up
5. Place straw into bottle so that the end is submerged, but not touching the bottom, and some of the straw is coming out of the top of the bottle (it helps to have a parent, friend, or sibling hold the straw in place)
 - a. You may need to cut the straw depending on the size of your bottle
6. Secure in place using modeling clay, making sure to make a tight seal on the bottle
7. Move your bottle around to different locations and watch the water level in the straw rise and fall with the temperature
 - a. Placed in the sun, the air in the bottle will warm and expand, pushing the water in the straw UP
 - b. Placed in the fridge, the air in the bottle will cool and contract, pulling the water in the straw DOWN

Note: This may look like a beverage to young children. Please supervisor all children while working with rubbing alcohol. Stay safe!



How To Build a Weathervane

You Will Need:

- Two (2) index cards
- Drinking straw
- Pin/pushpin
- Pencil w/ eraser
- Small paper cup
- Paper plate
- Tape
- Scissors



Instructions:

1. On the bottom of the paper plate, using a ruler draw large X, dividing the plate into four equal sections. Write N (for north) in the top section, E (for east) in the right section, S (for south) in the bottom section, and W (for west) in the left section;
2. Tape the small paper cup upside down in the center of the X;
3. Push sharpened pencil through the bottom of the paper cup and tape into plate;
4. Cut one index card into a square and tape to on end of the straw;
5. Cut the other index card into a triangle and tape to the other end of the straw;
6. Carefully push the pin through the center of the straw and into the pencil eraser (the straw should rotate freely);
7. Orient the directions on the paper plate (most cell phones have a compass you can reference) at your observation station outside. You may want to tape your weathervane to a table so it stays in place.
8. Observe the wind direction using your handmade weathervane!
9. Be sure to bring your weathervane inside when you are not observing wind direction!