



# METEOROLOGY: Wind Edition



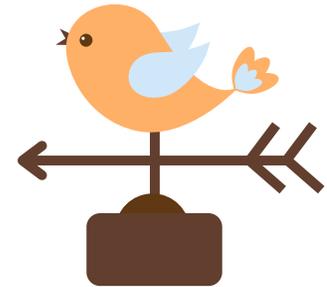
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Meteorology is the branch of science that studies the atmosphere and uses this information to forecast the weather. With this activity kit, you are going to build three different tools that can be used to help you measure wind and air pressure in your neighborhood! But why would we want to measure wind and air pressure?

Pilots care a lot about wind speed, direction, and air pressure because all will impact the flight of an aircraft! These measurements also help meteorologists identify changes in weather patterns.

Before you get started, there are three separate activities included below. While these activities build upon one another, they can be done at different times. It's okay to take your time. Just remember to have fun!

## Tool 1: Weathervane

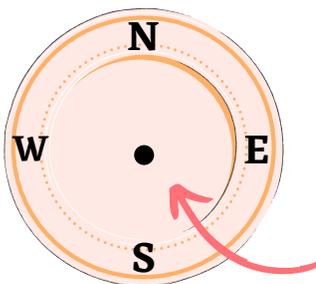


A weather vane is used to tell the direction the wind is blowing.

### Materials Needed

- Modeling clay
- Paper plate
- Pencil with fresh eraser
- 1 Safety Pin
- Straw
- Scissors
- Cardstock or Cardboard
- Markers/Crayons
- Compass (can be on your Smartphone)

For more information regarding these, or any of the materials listed for this activity kit, check out the supplementary materials on the Science Circus Whittier Project website.



### step 1:

On your paper plate, label North, South, East & West.

### step 2:

Place a ball of modeling clay in the center of your labeled paper plate. We have now made the base and we can move on to the vane.

### step 3:

Take out the straw and cut slits on both ends so that you can slide your arrow and tail (see Step 4) into both ends.



This activity is intended for use by adults and children who can read and follow directions and warnings.

- Contains functional sharp point.
- Not for children under 4 yrs.
- Children under 8 years can choke or suffocate on uninflated or broken balloons.
- May contain latex.
- Use for intended purposes only.
- Adult supervision advised.



# Directions

## step 4:

Cut out an arrow and a tail from your cardstock (or cardboard).  
Decorate the arrow and tail however you like!

## step 5:

Slide the arrow and tail into each end of the straw (where you made your cuts in Step 3). If you wish, you can lightly tape the arrow and tail into place for extra hold. You now have your vane!

## step 6:

Attach your vane to the pencil eraser using the safety pin (just make sure the safety pin is opened wide enough so that it does not hit the straw). Be careful, a safety pin is sharp.

## step 7:

Place your pencil into the center of the modeling clay that you attached to your paper plate in Step 2.

## step 8: Go outside to test your weathervane!

First, you need to know how to place your weathervane on the ground (or table) so that it provides you with accurate information.

- Using a compass (these can be found on many smart phones), find north.
- Line up the north on your paper plate to the direction that you identified with your compass.

IF it is really windy, you may want to place some rocks on your paper plate to keep it from blowing away.

## Questions:

Which direction is the wind blowing in the morning, mid-day, and afternoon?

What did you notice about the direction of the wind throughout the day?



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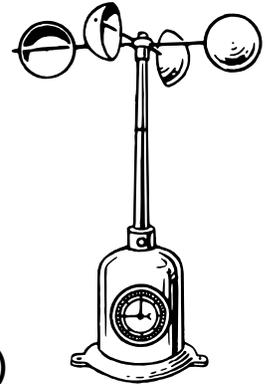


## Tool 2: Anemometer

An anemometer measures the speed of wind.

### Materials Needed

- Paper plate
- Modeling clay
- Four small paper cups
- Two straws
- One pencil
- 1 Safety Pin
- Tape
- Stopwatch or timer  
(can be on your Smartphone)



### Directions

#### step 1:

Place a ball of modeling clay in the center of your paper plate. We have now made the base and we can move on to the anemometer.

#### step 2:

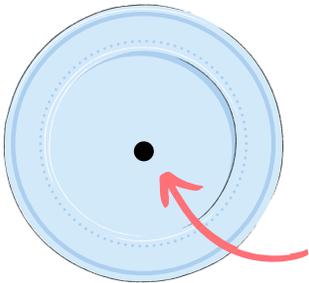
Place the two straws so that they make an "x" and secure with tape.

#### step 3:

Mark one of the cups so that it is clearly different from the others (this will help you keep track of it when the anemometer is spinning).

#### step 4:

Tape one cup to each end of the straw "x" that you made in step 1. Attach the cups like the picture shown (so they always catch the wind in the same direction as your anemometer is spinning).



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### Step 5:

Attach the straw “x” to the pencil using the pin. Be careful, a pin is sharp!

### Step 6:

Place your pencil into the center of the modeling clay that you attached to your paper plate in step 1.

You can use your anemometer to measure how fast the wind is blowing by measuring how fast the cups spin around. You can count the number of spins in a particular length of time. More spins in a time period means the wind is traveling at a faster speed. But how fast is that exactly? To answer this question you must calibrate your anemometer - check out how on our supplementary page.



## Experimenting

With the help of an adult, you can use a blow dryer or fan to test out your anemometer. Set your blow dryer/fan to high and hold it one arm’s length away from your anemometer. How many times does your anemometer spin in 10 seconds? If your anemometer is spinning too fast to count, you might have to move your blow dryer/fan farther away.

- Set your blow dryer/fan to low and hold it the same distance away as last time. How many times does your anemometer spin in 10 seconds?
- What did you notice about the number of spins of your anemometer after changing the blow dryer/fan setting?
- How can you use your anemometer to measure wind speed outside? Where would you place it and why would you place it there?

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# Tool 3: Barometer

A barometer measures air pressure, or the weight of molecules of air pushing down on a surface. When barometers measure low air pressure, it usually means you are going to see clouds, wind, and maybe even some precipitation (like rain). When high air pressure is measured, the skies are often clear and we experience calmer weather.

## Materials Needed

- Glass or metal jar
- Balloon (new, not stretched out)
- 1 rubber band
- Glue
- Tape
- Two straws
- Construction paper
- Scissors
- Markers/Crayons



## Directions

**step 1:** Cut the balloon and keep the rounded part like you see in the picture.



**step 2:** Stretch the rounded part of the balloon over your jar so that it is very tight. Secure the balloon in place with your rubber band.



**step 3:** Take out one straw and cut one end in half so that you can slide a piece of paper in between the two parts of the straw.

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**step 4:** Cut out a small triangle (approximately 1cm on each side). Slide the triangle into the end of the straw that you cut. You may wish to tape the triangle in place

**step 5:** Combine the two straws so that they make one long straw; this can be done by pinching one straw's end and sliding it into the end of a second straw.



**step 6:** Place a small amount of glue in the center of the balloon that you stretched on your jar. Place one end (the end opposite of the one with the arrow) into the glue and lightly secure into place with tape. Let the glue dry for several hours and then remove the tape.

**step 7:** Your barometer is now ready to test! On a piece of paper, write sunny/clear at the top and cloudy/rainy approximately 5 inches apart. In between these two points, use a ruler to mark every 1/8 of an inch as shown in the picture.

- Place your barometer in a safe place in your home by a wall that faces outside.
- Next to the arrow at the end of your straw, place the paper that you wrote on (make sure to ask an adult for how to best affix the paper to the wall).
- Over the next few days, check to see when the arrow moves up or down on your paper, this movement is tracking the changing air pressure!

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# Putting it Together!

What meteorologists will do is keep track of their measurements over time so that they can understand changing weather patterns. Oftentimes when meteorologists (and scientists in general) want to keep track of measurements, they use a table, like the one below, to help them stay organized. On the table below you can write down the wind's direction, speed and measure air pressure at different times; this could be at different times of the day (morning, noon, bedtime), or the same time on different days (for example, 3pm on Monday, Tuesday, Wednesday). Each time you collect your measurements, you can also write down your observations (for example, is it sunny or cloudy, warm or cool, etc.).

	Wind Direction	Wind Speed	Air Pressure	Observations
Time 1				
Time 2				
Time 3				

If you liked this activity (and we hope you did), there is lots more you can learn about weather! Go to our website to find a Local Resource Guide on cloud watching. There are children's books about weather on our Books of the Month webpage (with additional activities).

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