

# MAKE YOUR OWN WEATHER STATION



This activity shows you how to make your own weather station at home. After creating your weather instruments, write down a weather report at the same time each day using the sheet at the end of these instructions. Do this every day of the month and at the end of the year you will have a complete record of your weather, just like a real expert!

Most of the supplies are household materials but a few items may need to be purchased online. Instructions begin on the next page (adult supervision will be required).

**THERMOMETER:** An instrument that measures air temperature. Older thermometers used glass tubes filled with liquid mercury or alcohol. As the air temperature warmed, the liquid inside the tube would rise. Today we use digital thermometers that read the air temperature electronically. The air is usually warmest in late afternoon, and coolest in early morning just before sunrise. These readings are called the day's HIGH temperature and the day's LOW temperature.

*How does air temperature affect our daily lives?*

**To make a Thermometer:**

It's best to buy an inexpensive thermometer from a hardware store for your home weather kit. Many of these are inexpensive and will give both the temperature outside as well as inside your home.





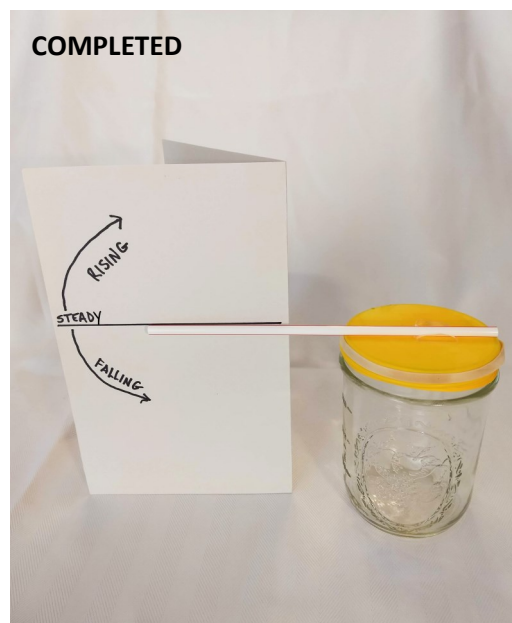
**BAROMETER:** An instrument that measures air pressure. Tiny particles in the air, called molecules, cause the air's pressure to rise and fall depending on the heat of the sun. Weather experts use barometers to measure this rise and fall. When the molecules cool off and rise high in the atmosphere, LOW pressure occurs. This causes a barometer's reading to fall. If the molecules warm up, they push down toward Earth, causing HIGH pressure. This causes a barometer's reading to rise. A rising barometer usually predicts good weather, while a falling barometer could mean bad weather is on the way.

*How could air pressure help us know what we could do outside (or not)?*

**To make a Barometer you need:**

Medium glass jar  
Plastic straw  
Balloon  
Scissors  
Rubber band  
Cardstock paper  
Glue or adhesive tape  
Marker/pencil

Take the balloon and cut off the end that air is blown into. Stretch the trimmed balloon over the top of the jar to trap the air inside. Secure the balloon around the rim of the jar with a rubber band. Using glue or tape, secure the plastic straw to the top of the balloon. Take the cardstock paper and fold it in two so that it can stand up next to the jar. Make a mark on the paper where the end of the straw lands. This is your base air pressure reading. When you put the barometer outside, the air pressure will either rise, causing the straw to move upward, or fall, causing the straw to point downward from the base reading. That's how you can tell whether the air pressure is rising or falling!



**WEATHER VANE:** An instrument that measures wind direction. Weather vanes help us know which way the wind is blowing. The vane, usually an arrow, moves around and points to a compass direction (north, south, east, west or a combination like southwest). We record the wind's direction based on where the wind came FROM, not where it is GOING. So, when we say it's a "west wind," it means the wind is coming in from the west and blowing toward the east.

*How could knowing the wind's direction help us predict tomorrow's weather?*

**To make a Weather Vane you need:**

Plastic or ceramic pot filled with dirt or gravel

Pencil with full eraser

Paper or Styrofoam plate

Cardstock paper or light cardboard

Plastic straw

Scissors

Straight pin

Marker or pen

Compass (for directional markers)

Fill the pot with dirt or gravel. Take your paper or Styrofoam plate and mark four points equidistant around the edge: these will represent the compass points NORTH, EAST, SOUTH, and WEST in order around the edge. Set the pot on top of the plate. Stick the writing end of the pencil down into the dirt so it is secure. Take the plastic straw and cut a slit into either end. Find the exact middle of the straw and stick the straight pin through it to secure the straw to the eraser end of the pencil. Make sure that the slits are positioned vertically and that the straw can easily spin around on the pin. Cut out the front and back of an arrow on the cardstock or light cardboard. Stick them into the slits on either end of the straw to make a pointer (secure with tape). Using a compass or the position of the sun, take the weather vane outside so that NORTH on the plate is facing north. Your weather vane is ready to catch the wind and give you a directional reading!



**ANEMOMETER:** An instrument that measures wind speed. When air moves, it causes wind. Weather experts measure the speed of the wind using an anemometer. Most anemometers spin at the same rate as the wind blows. If there is no wind, the air is CALM. As the wind picks up, it can be called GENTLE, MODERATE or STRONG. Storms such as tornadoes and hurricanes can cause wind so strong that it blows down buildings!

*Why would you want to know how strong the wind might blow today?*

**To make an Anemometer you need:**

Plastic or ceramic pot filled with dirt or gravel

Five small paper, plastic or Styrofoam cups

Two plastic straws

Pencil with full eraser

Straight pin

Single hole punch

Tape

Fill the pot with dirt or gravel. Stick the writing end of the pencil down into the dirt so it is secure. Take one cup and punch four holes on the side equidistant around the top edge, then carefully cut the bottom half of the cup off so it forms a ring. Take the straws and slide them through the side holes to form an X in the top of the cup ring. Cut a single hole on the side of the remaining four cups near the top of each. Poke the four ends of the straws through a hole in each cup to secure them (can use a small amount of tape to help hold them on). Make sure the open end of the cups are facing the same way so they can catch the wind. Take the straight pin and poke it through the center X of the straws and into the eraser on top of the pencil. Make sure the straws and cups can easily spin around. Place the anemometer outside where the wind will not be obstructed by trees or your house. Take a wind speed reading (calm, gentle, moderate, or strong) for the day!



**RAIN GAUGE:** An instrument that measures precipitation. When moisture builds up in clouds, it eventually becomes heavy enough to fall to the ground. This is what weather experts call precipitation. Precipitation usually falls as rain. If it's cold enough, however, precipitation may fall as sleet or snow. Weather experts measure rain using a rain gauge. The gauge tells how many inches of rain fell in a day.

*Why would you want to know how much rain or snow has fallen? Who might want to know this information?*

**To make a Rain Gauge you need:**

Large plastic jug (soda bottle) with straight sides

Scissors

12" ruler

Duct tape

Sand or small gravel

Marker

Water

Using scissors, carefully cut off the top of the soda bottle where the sides start to narrow to the spout. Fill the bottom of the open soda bottle with a one-inch layer of sand or small gravel to weigh it down. Pour enough water onto the sand or gravel to cover it (this will be the base reading for your rain gauge). Tape the top of the soda bottle back on with duct tape but have the spout pointing down into the bottle. Take the ruler and write on the side of the bottle a set of inch markings (up to 6 inches) starting up from where the sand/gravel and water line are in the bottom. Sit the rain gauge outside in the open so that precipitation can fall into the top. Whenever it rains, take a measurement using the ruler on the side!



**THIS MONTH'S WEATHER:**\_\_\_\_\_

Write the month and year above. Then use your home-made weather instruments to record each day's weather for the month. The first line gives an example of what to write. By the end of the year you will have a full annual weather report!

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