

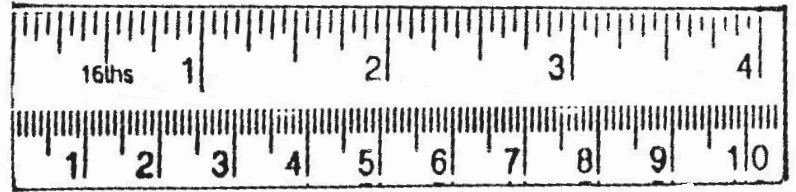
# Nature Kids: Science Projects Just for Fun ...

## Make Your Own Weather Station Project

Weather is made by the Earth, Air, Water and Sun working together. You can keep track of the weather at your house with these homemade weather instruments: a rain gauge to measure rainfall; a weather vane to show wind direction and an anemometer to measure wind speed.

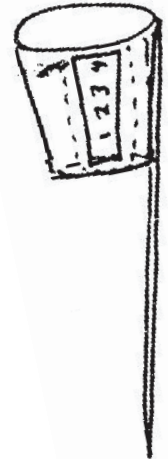
### Rain Gauge Materials:

- Tall 9 oz. clear Solo cup
- 12" or longer wood dowel or other straight stick
- The paper ruler on this page or a copy
- Clear packing tape



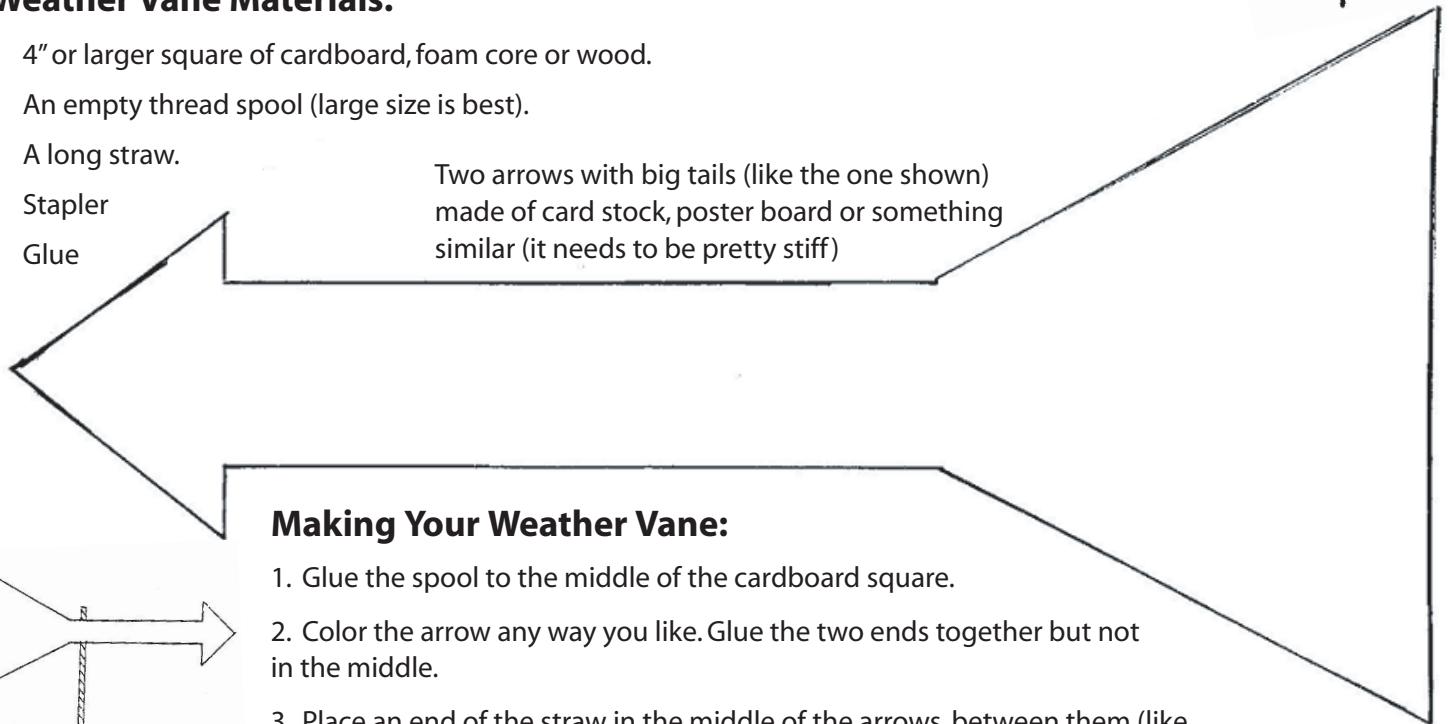
### Making Your Rain Gauge:

1. Tape the paper ruler to the cup, straight up and down. The number 1. should be closest to the bottom, the number 4. should be closest to the top.
2. Use the packing tape to attach the cup to the wood dowel or stick. Make sure the wood dowel or stick is NOT next to or covering the ruler. Wrap the tape all the way around the cup, covering the paper ruler completely (to protect it from the rain).
3. Stand the cup outside in the open where the rain will fall into it. Don't choose a place too close to a tree or to your house or some of the rain will be blocked.



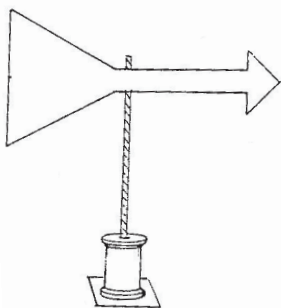
### Weather Vane Materials:

- 4" or larger square of cardboard, foam core or wood.
- An empty thread spool (large size is best).
- A long straw.
- Stapler
- Glue
- Two arrows with big tails (like the one shown) made of card stock, poster board or something similar (it needs to be pretty stiff)



### Making Your Weather Vane:

1. Glue the spool to the middle of the cardboard square.
2. Color the arrow any way you like. Glue the two ends together but not in the middle.
3. Place an end of the straw in the middle of the arrows, between them (like an arrow, straw sandwich) and staple.
4. Set your weather vane up and it will point in the direction the wind is blowing FROM.



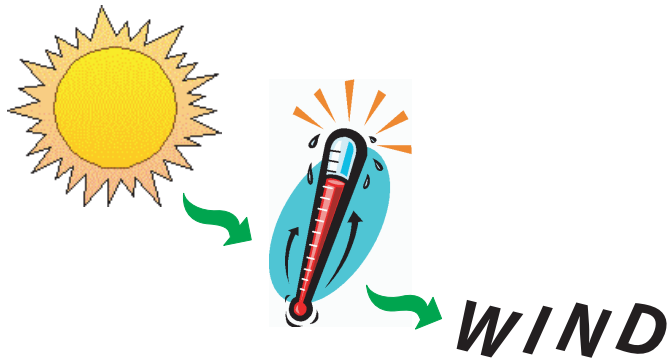
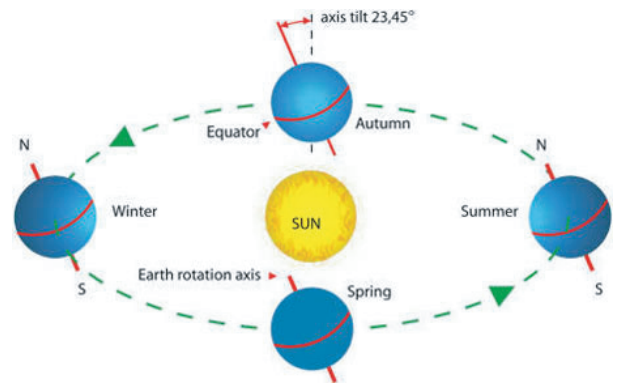
See the **Teacher's Corner** for more background about How Weather Works.

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# Teacher's Corner: How Weather Works ...

Our vast varieties of weather, from bone-dry desert days to ice storms and flood causing hurricanes, result from the interaction of the sun, the Earth, air and water. The sun provides the heat, which warms the air creating wind. Water falls from clouds as rain, sleet and snow, filling lakes, rivers and seas, and evaporates again to form new clouds. The Earth spins around, giving us day and night, and it revolves around the sun, creating our seasons.

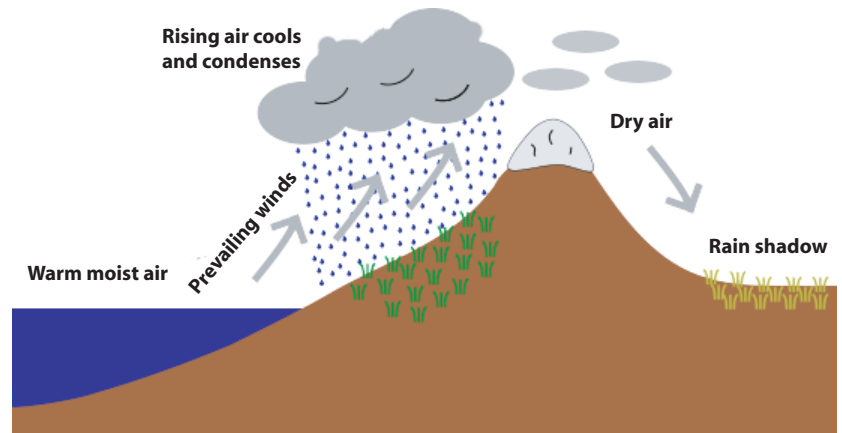
Let's start with the Earth. As it revolves around the sun, its 23 degree tilt causes the length of day and the intensity or directness of the radiation to change. So while every place on Earth gets the same amount of sunshine over the course of a year, the patterns are very different. Along the equator, day and night are each 12 hours long throughout the year. At the Poles, it's very different. During summer, the days extend nearly 24 hours, while in winter night lasts all day. These differences create large air masses – warm in the Tropics and cold in the Polar regions -which then move: polar air masses towards the equator, tropical air masses towards the poles.



Air, which often appears uniform, really isn't. As the sun shines on the atmosphere, the molecules of air absorb the radiation, which causes them to vibrate faster (we measure this as rising temperature). As they speed up, they bounce off each other and spread apart, becoming less dense. This less dense (warmer) air will rise (because it is "lighter"). The warm air rising creates a vacuum which pulls neighboring air in, creating wind.

Another factor that can vary is moisture content. The temperature and density of air affect how much moisture the air can hold. Warm air can hold more water than cool. Low pressure air masses can hold more moisture than high pressure masses. Moisture content, or humidity, affects the dew point, the temperature at which water droplets will condense out of the air onto grass and bushes, or form fog.

Most of the water that becomes clouds evaporates from oceans. It is carried, often as clouds, by the wind. As the wind hits mountains, plateaus, even masses of colder air, it is forced up. The clouds cool, and the water droplets condense and fall as rain, sleet, snow or hail. Since prevailing winds in the United States blow from the west, more rain falls on the western slope of our mountains, leaving the eastern slope in a "rain shadow". Our deserts in the Southwest are examples of this rain shadow effect.



This is a simplistic explanation of some of the factors that help create our weather. If you would like to further your investigation of weather try these books:

Williams, Jack. "The Weather Book." Vintage Books, New York, 1992

Allaby, Michael. "How Weather Works." The Reader Digest Association, New York, 1995

See the **Nature Kids** for some fun weather projects you can make at home.

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