

Week 4: Weather the Summer

Don't let summer storms dampen your fun. Instead, assemble your own weather station to understand how meteorologists study and predict the weather. Make a rain gauge to track rainfall amounts, a wind vane to see which way the wind blows, an anemometer to calculate wind speed and barometer to measure air pressure. Then collect and compare data and even make your own weather forecasts.

Experiment

WEATHER STATION

Materials

Paper ruler and protractor (available at msichicago.org/summerbrain)

Plastic, 2-liter bottle

Gravel

Two index cards

Two straws

Pencil

Pushpin

Paper clip

Modeling clay

String

Ping pong ball

Small jar or cup, such as a yogurt cup or juice glass

Balloon

Rubber band

Thermometer

Scissors

Tape

Glue

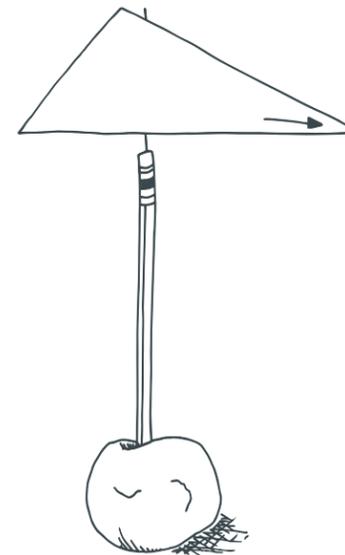
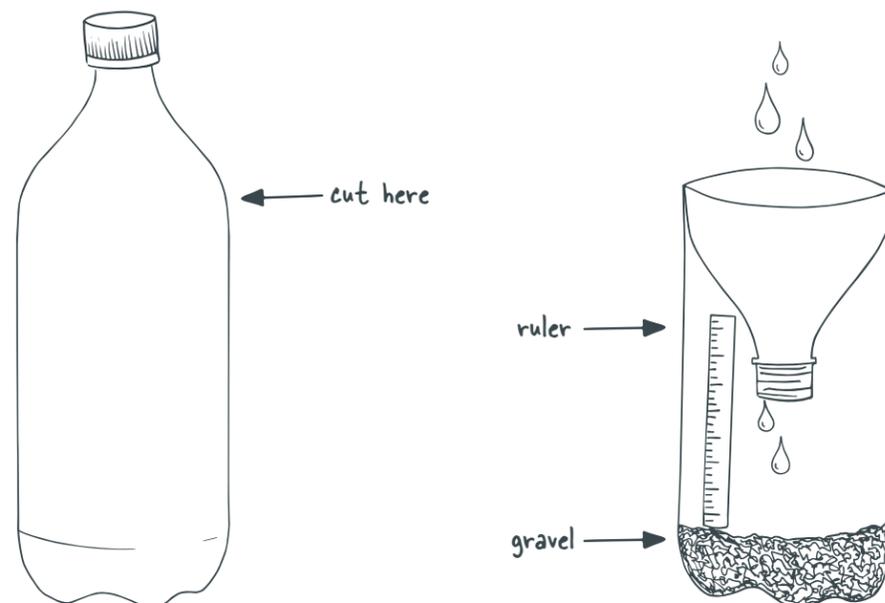
Paper

Weather log (available at msichicago.org/summerbrain)

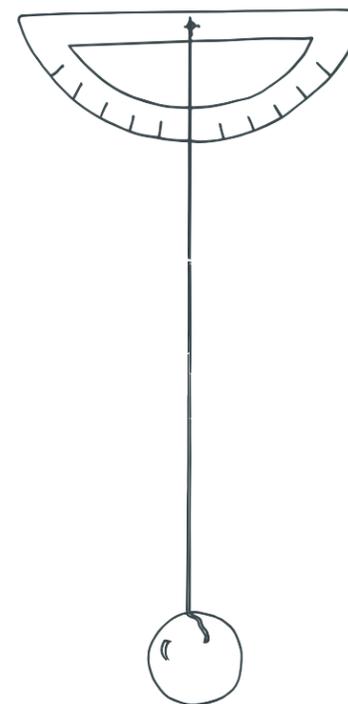
Instructions

Assemble your instruments, then put them all together on a base (like a tray or a box) to make an all-in-one weather station. Add a thermometer so you can track the temperature. Put your weather station outside and collect your data.

Rain Gauge: Cut off the top fourth of a two-liter bottle. Add gravel to the base of the bottle and tape a paper ruler outside with the "0" mark at the top of the gravel. Add water until it reaches the top of the gravel. Invert the top of the bottle, place it inside the base and cover the cut edges with tape. Decorate the outside of the bottle. Measure each rainfall on the ruler.

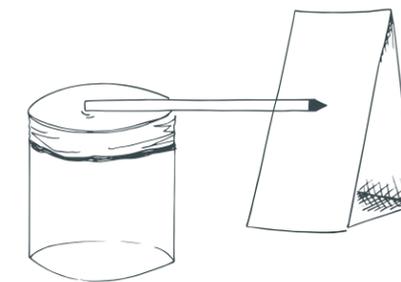


Wind Vane: Cut two identical triangles from index cards. Poke a hole through a straw with a pushpin and insert one end of a straightened paper clip into the hole and through the straw. Tape the triangles to the straw so that one side of the triangle is parallel to the straw; cut the ends of the straw so they remain inside the triangle. Poke a hole in the eraser on top of a pencil and insert the paper clip. Use clay at the base of the pencil to hold the wind vane in place. The narrow tip should point in the direction the wind blows.



Anemometer: Tape one end of a piece of string to a ping pong ball and the other to the center of the straight edge of a protractor. Hold the anemometer with the straight edge parallel to the floor. Note the angle of the string when the wind blows, then use it to calculate the wind speed; check the chart on our protractor template.

Barometer: Cut the neck off a balloon, stretch the balloon over the top of a jar or small cup and secure it with a rubber band. Cut a straw in half and trim at an angle to make a point; glue the opposite end to the center of the balloon. Make a gauge by cutting a strip of paper and folding it in half so that it stands next to the straw (the paper should be about twice as tall as the jar). Mark on the gauge where the straw points each day.



What's happening?

Weather describes the temperature, humidity, atmospheric pressure, wind, rainfall and other meteorological characteristics of the atmosphere in a specific place at a specific moment in time. Instruments help measure the weather. A rain gauge measures how much rain falls at a time. A wind vane shows which direction the air blows and an anemometer measures the speed of the wind. A barometer measures air pressure; low or falling pressure (when the straw points downward) means a storm is approaching, while high or raising pressure (when the straw points up) means sunny weather.

Game on!

Collect data all summer on a weather log, including the temperature and observations on what you see (sun, clouds, etc.). Guess what tomorrow's weather will be - even make a video forecast like a TV meteorologist!—then check the next day to see if you're right.

More Ways to Play With Weather

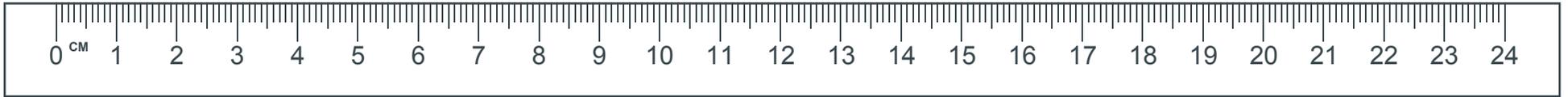
Explore the physics behind weather in MSI's *Science Storms* exhibit, which features large-scale natural phenomena like tornados, avalanches and tsunamis.

Like this activity? You could be a ...

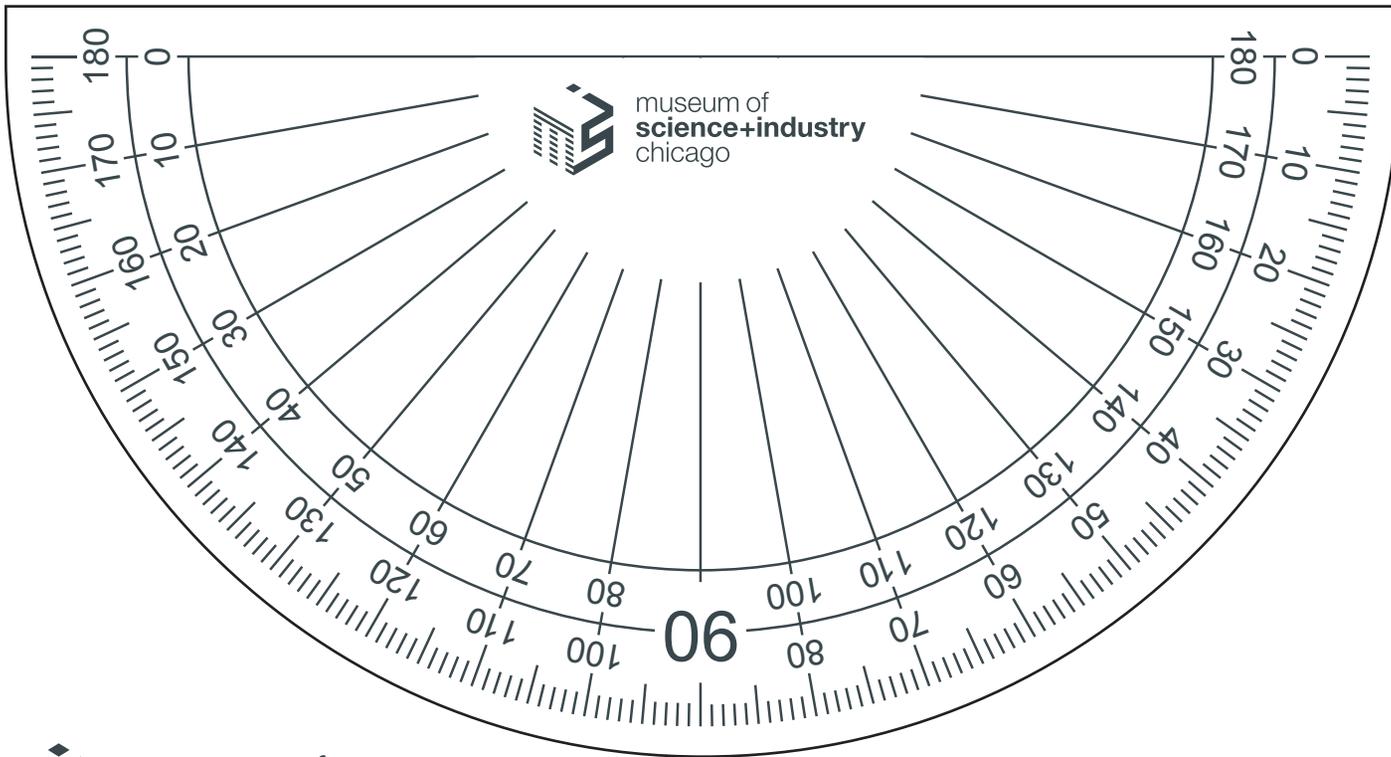
- Meteorologist
- Atmospheric Scientist
- Data Analyst
- Climate Scientist

summer BRAIN GAMES

Weather Station Instruments



Rain Gauge



Anemometer

Wind Speed Chart

Angle	Wind Speed (km/hr)
90°	0
95°	9
100°	13
105°	16
110°	19
115°	21
120°	24
125°	26
130°	29
135°	31
140°	34
145°	37
150°	41
155°	46
160°	52

summer BRAIN GAMES



Weather Log

Date	Time	Pressure Barometer	Precipitation Rain Guage	Wind Direction Wind Vane	Wind Speed Anemometer	Temperature Thermometer	Observations