

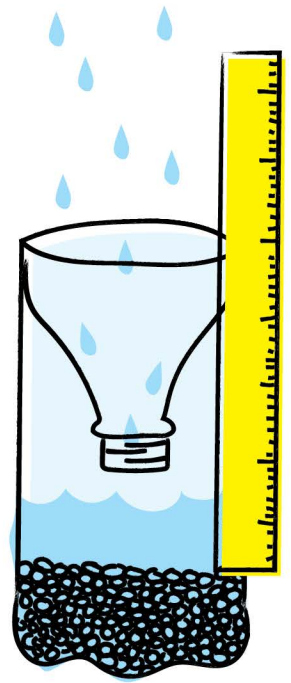
# WEATHER STATION

Scientists observe and record natural events using tools for precise measurements. You can do this by building your own weather station to record the weather events that happen in your backyard. Make a rain gauge, wind vane, anemometer and barometer, then collect and compare data and even make your own weather forecasts.

## RAIN GAUGE MATERIALS

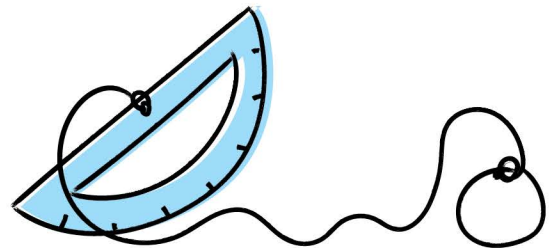
- ☐ Plastic 1- or 2-liter bottle (with straight—not curved—sides)
- ☐ Gravel
- ☐ Ruler
- ☐ Tape

**INSTRUCTIONS:** Cut off the top fourth of a one- or two-liter bottle. Add about two inches of gravel to the base of the bottle. Tape a paper ruler on the outside of the bottle with the “0” mark at the top of the gravel. Add water until it reaches the top of the gravel. Make a funnel by inverting the top of the bottle that you cut off, placing it inside the base and covering the cut edges with tape. When it rains, measure the rain-fall amount on the ruler.



## ANEMOMETER MATERIALS

- ☐ String
- ☐ Ping pong ball
- ☐ Thermometer
- ☐ Scissors
- ☐ Tape
- ☐ Protractor (available at [msichicago.org/summerbrain](http://msichicago.org/summerbrain))



**INSTRUCTIONS:** 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 on top, 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 MATERIALS

- ☐ Small jar or cup, such as a yogurt cup or juice glass
- ☐ Balloon
- ☐ Tape
- ☐ Index card or piece of thick paper
- ☐ Straw
- ☐ Rubber band
- ☐ Scissors

**INSTRUCTIONS:** 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. Tape the straw to the balloon so the end is in the center and the pointed end extends over the edge of the jar. Tape should run along the full length of the part of the straw that's on the balloon, reaching to the edge of the jar. Make a gauge by folding an index card in half so that it stands next to the straw (the index card should be about twice as tall as the jar). Mark on the gauge the location where the straw points each day.



## GENERAL MATERIALS

- ☐ **Thermometer**
- ☐ **Tray or box**
- ☐ **Weather log**  
(available at [msichicago.org/summerbrain](http://msichicago.org/summerbrain))

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. Thermometers are difficult to make, so it's best to buy an inexpensive thermometer. Put your weather station outside and collect your data.



## 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. 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.

## EXTENSIONS

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 by using the patterns you have observed from your weather station. You can even make a video forecast like a TV meteorologist, then check the next day to see if you're right.

## LEARN MORE

Watch weather formations across the globe in MSI's *Earth Revealed* Exhibit.

## RECOMMENDED READING

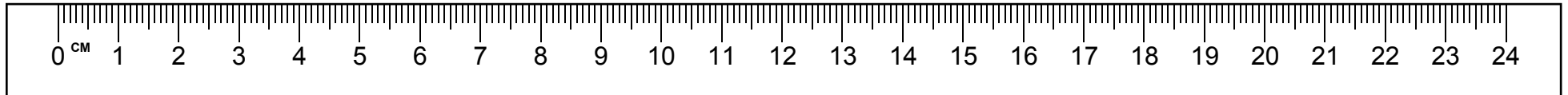
*Down Comes the Rain*,  
by Franklyn M. Branley

*Magic School Bus Presents:  
Wild Weather*, by Sean Callery

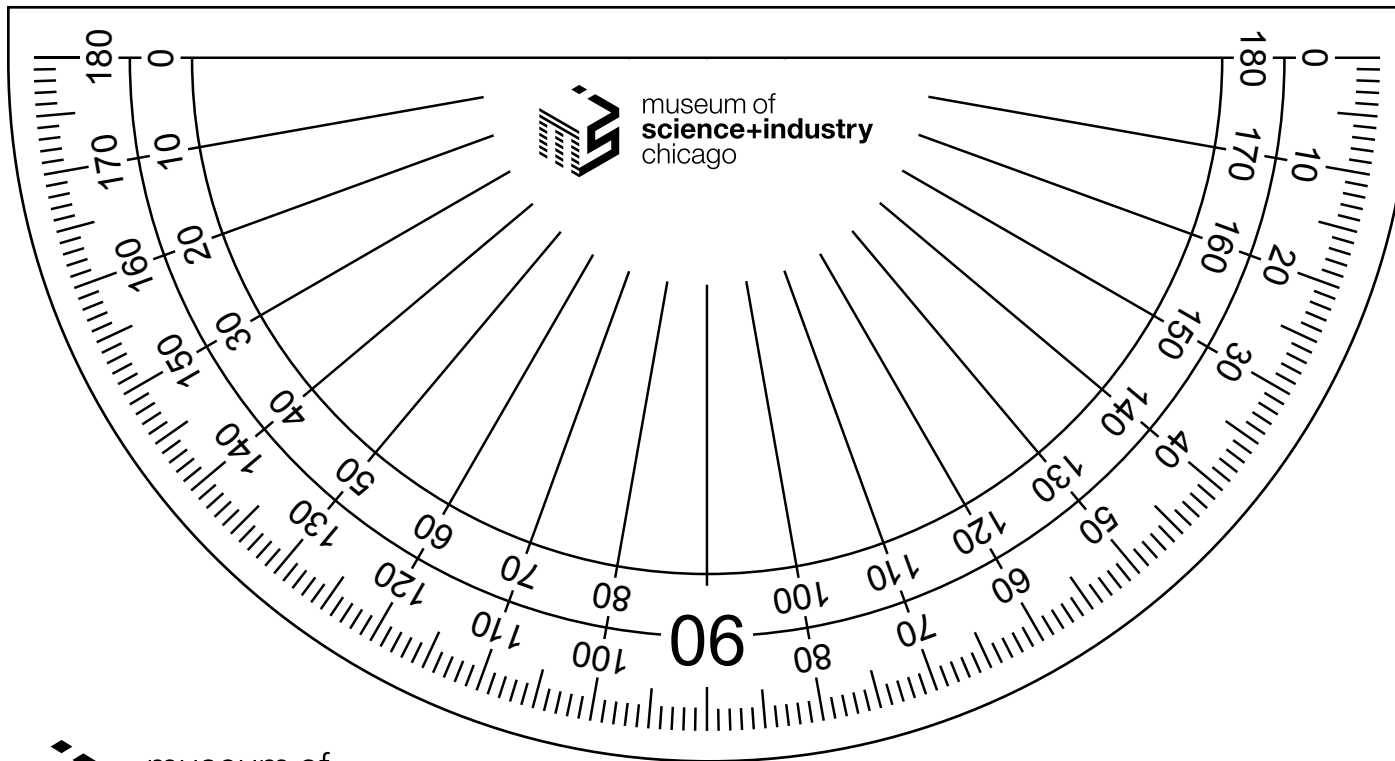


# WEATHER STATION INSTRUMENTS

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



# WEATHER LOG

DATE	TIME	PRESSURE Barometer	PRECIPITATION Rain Guage	WIND SPEED Anemometer	TEMPERATURE Thermometer	OBSERVATIONS