



All About RAIN

How much rain is falling outside your front door? Measure it! Rain clouds are made of droplets of water so small there are billions of them in a single cloud. How much rain falls during a shower or during a day, week, or month? You can find out by measuring it with a rain gauge. The most common rain gauge used today by official forecasters and airports was invented over 100 years ago. The official rain gauge has a 50 centimeter high cylinder with a 20 centimeter in diameter funnel that collects water into a measuring tube that has exactly one-tenth the cross sectional area of the top of the funnel. The reason for the smaller measuring tube is so that more precise rainfall measurements can be made due to the exaggeration of the height of water in the tube. For example, one-tenth of an inch of rainfall would actually fill an inch of the measuring tube. A special measuring stick inserted into the measuring tube takes into account the vertical scale exaggeration. This exaggeration allows meteorologists to make very precise measurements to one-hundredth of an inch. The standard rain gauge can measure up to two inches of rain. If rainfall exceeds two inches, water overflows into the cylinder surrounding the measuring tube. The observer takes the water in the cylinder and very carefully pours it into the measuring tube after emptying the tube. The observer then adds the measurement from the water in the cylinder to two inches in order to obtain the final rainfall amount.

Try This Outside Your Front Door

Record the rain with one of these projects:

- Short Term Rain Gauge
- Long Term Rain Gauge
- Lazy man's rain gauge

Short Term Rain Gauge

This rain gauge is best for taking rainfall amounts in a period of one day to a one week period.

Here's what you will need for a Rain Gauge:

Basic plaster ruler

A straight-sided recycled glass container, such as a bottle for olives or pickles

Scissors

Tape

Here's how to build the rain gauge:

1. Stand the ruler inside the glass container so that the ruler rests on the bottom of the container.
2. Tape it at the top, to the inside of the jar, so that the ruler does not fall.
3. Place your rain gauge outside before it starts to rain.
4. Measure the amount of rainfall each day for one week and record your results.

Long Term Rain Gauge

This rain gauge is best for taking rainfall amounts over a longer period, for example a week to one-month measurement.

Here's what you will need to build the rain gauge:

Sharp scissors
Fine mesh screen
Nail file
2 two-liter recycled bottles (tops removed)
Permanent marker
Ruler
Duct tape
Vegetable oil
Bleach (optional)

Here's how to build the rain gauge.

1. Carefully cut a two-liter bottle in half to make a funnel.
2. Place the cut bottle on the uncut bottle so that spouts are touching and in line.
3. Tightly tape the bottle spouts together. Place the screen over the funnel opening and press it slightly inward. Tape it in place.
4. Mark the rain gauge up the side in 1/4-inch (or 1/2-cm) graduations with the permanent marker. For more accurate readings, tape a ruler to the side of the bottle.
5. Pour in enough vegetable oil to cover the bottom of the rain gauge in a thin layer. Put the screen in place over the gauge.
6. Place the rain gauge outside, preferably in a shady, but not covered, spot.
7. Periodically check the gauge and put a few drops of bleach to prevent contamination but never touch or drink the water as it may contain bacteria or other pathogens that can make you sick!

Lazy man's Rain Gauge:

Challenge yourself to smell rain coming--many people can! Some scientists believe moisture and impending rain makes your nose more sensitive. Warm and humid air enhances our sense of smell. Humidity can carry odor molecules (smells like a nearby power plant or cow pasture or donut shop) to our noses. And as humidity increases so does the threat of rain. Lowering barometric pressure and rising air currents are also indicators of likely precipitation and they both enhance the transmission of smells in the distance. When you know rain is coming, write down what it smells like outside your front door. What is the wind like? Record what you observe in a weather journal.

Rainfall Extremes

Most rainfall in one day

73.62 inches (Reunion, Indian Ocean; March 15, 1952)

Most rainfall in one year

1,041 inches (Assam, India; August 1880-1881)

Most Chicago rainfall in one day

6.24 inches August 12-13, 1987

Longest Chicago dry spell

30 days, January 7 - February 5, 1919

Test Your Knowledge about rain

- A. You can find how much rain has fallen using a _____.
- B. Rainfall is usually measured in _____.
- C. What are the colors of the rainbow?

Answers

- A. Rain gauge
- B. Inches
- C. Read, orange, yellow, green, blue, indigo, violet TIP: memorize "Roy G. Biv"

Note: All of these experiments, encouraging recycling while learning about weather, are being presented by Amy Freeze