

Rain Quantity



Topic

Measuring quantities of rainfall at different sites

Introduction

Water falling from clouds is called precipitation and is part of the water cycle. Water may fall as rain, hail, or snow – depending on the air temperature and the type of cloud. Rain happens only when the droplets of moisture grow and become too heavy for the clouds to hold them. Meteorologists use rainfall data to monitor changes in the annual total at sites across the country. Over the long term, these may indicate trends in climatic change. A rain gauge is an essential piece of apparatus in a weather station. In this experiment, you will construct rain gauges to measure rainfall at different sites. Will there be a difference in the quantities recorded?

Time needed

30 minutes to make each rain gauge
15 minutes daily for two weeks to measure rainfall

Materials

3 large, clear plastic soft drink bottles (empty)
4 empty glass jars (e.g., jelly or baby food jars)
50-ml graduated cylinder
scissors
adhesive tape
small shovel

Safety note



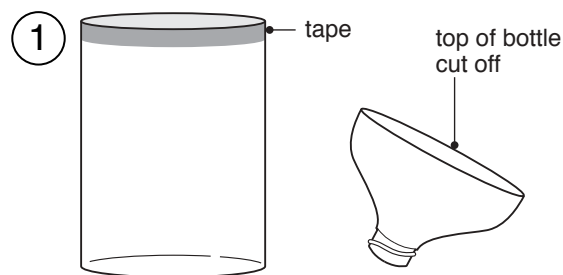
Be careful when using the scissors to cut the bottle.

Procedure



Part A: Making the rain gauge

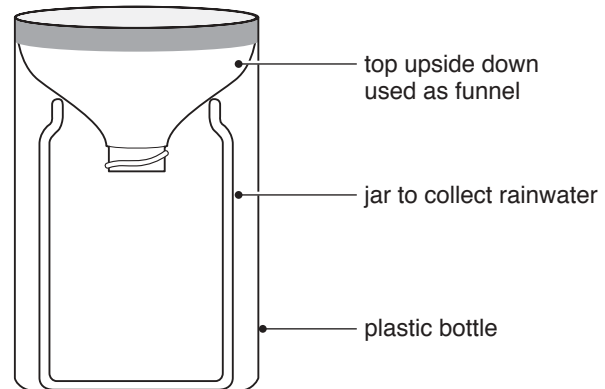
1. Affix some tape around one of the plastic bottles where the curved top meets the straight sides.
2. Use the tape as a guide for pushing the point of the scissors into the bottle and cutting the top off (see diagram 1 adjacent).



Removing the top of the bottle

3. Place the jar in the base of the bottle.
4. Turn the top of the bottle upside down and fit it into the lower section of the cut bottle, inside the jar (see diagram 2 below). This will act as the funnel and stop the water inside the bottle from evaporating.

2



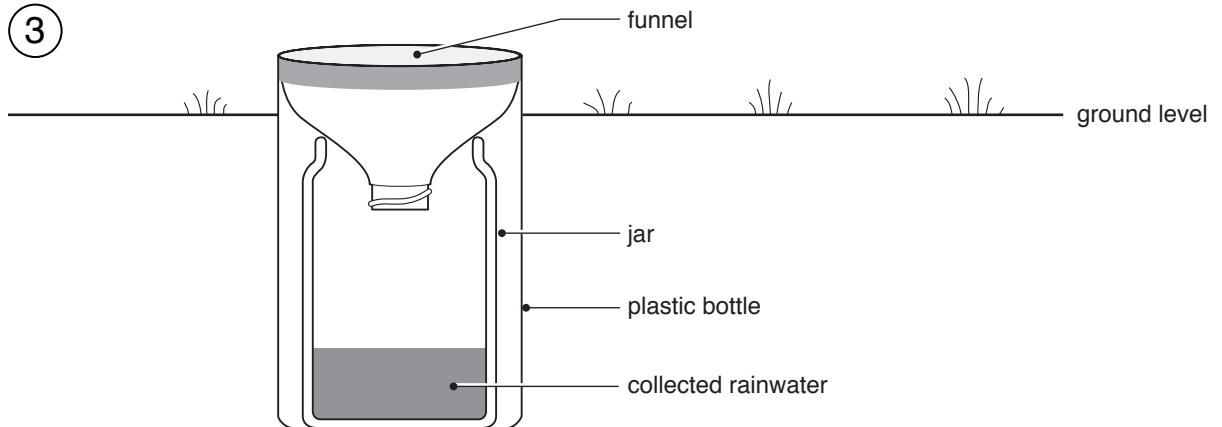
Positions of the different parts to make the finished rain gauge

5. Repeat stages 2 to 4 to make a total of three rain gauges.

Part B: Measuring rainfall

1. Choose three sites outside – one in the open, another close to a building, and the third near trees.
2. At each site, dig a hole so that most of the rain gauge can sit safely inside. You will need to have the top above ground to prevent splashes or water flowing into the gauge (see diagram 3 below).

3



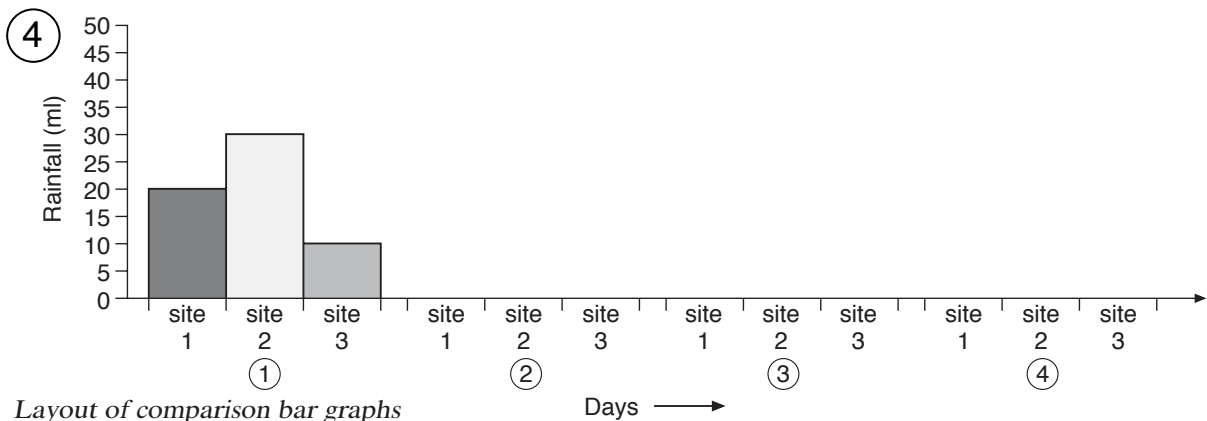
Position of rain gauge for collecting rain

3. If the ground is unsuitable for digging a hole, secure the rain gauge with stones, or other suitable objects, to stop it falling over or blowing away in the wind.
4. At the same time each day, remove the glass jar from the rain gauge. If there is no water in the glass jar, replace the jar and the funnel and record 0 ml in the data table for that site. If there is water in the jar, pour it into the remaining empty glass jar. Return the first jar and funnel to the rain gauge.
5. Pour the water from the jar into the measuring cylinder. Record the volume of rainwater in the data table and then pour out the water.
6. Repeat stages 4 and 5 for each site.

| DATA TABLE | | | |
|-------------------|--------|--------|--------|
| Rainfall (ml) | | | |
| Date | Site 1 | Site 2 | Site 3 |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| 13. | | | |
| 14. | | | |

Analysis

1. Draw comparison bar graphs showing the rainfall at the three sites over the week. Diagram 4 below shows an example graph.



2. Calculate the total rainfall for each site for that period.
3. Compare the sites and describe any differences in results.
4. Why are there differences? Which site would give the most accurate measurement of the rainfall?
5. Do some research and find out the total annual rainfall in your area. Divide that figure by 26 to get the average rainfall over a two-week period. Was your rainfall total from your most accurate site above or below this average?

Want to know more?