



national science week 2020

Backyard Science – Recycled Weather Station

Lovely day for it! Why do people talk about the weather so much? Why not spice up the conversation with some real weather science and build your own weather station.

Safety

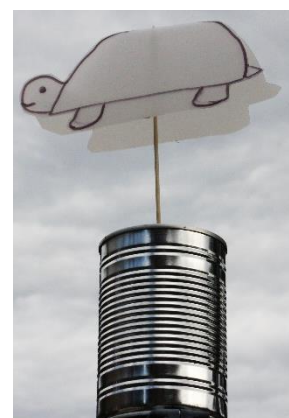
When doing science activities outdoors, wear sun protection and comfortable, closed-in shoes. Take care when disposing of balloons or any other materials that could cause harm to the environment.

What you need

Reuse rain gauge – transparent container with straight sides, ruler, and a fine-tipped permanent marker

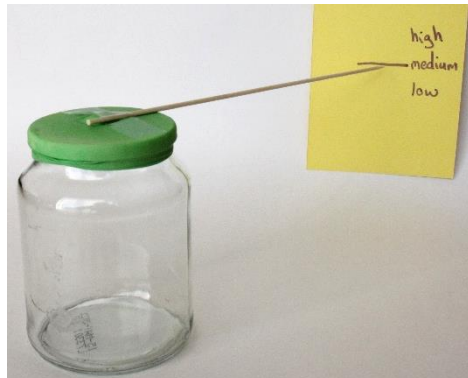
Milk bottle weathervane – tin full of sand or dirt, bamboo skewer, empty 2 litre plastic milk bottle, permanent marker, scissors, ballpoint pen

Balloon barometer – glass jar, balloon, scissors, bamboo skewer, sticky tape, cardboard



What to do

Reuse rain gauge – Use the ruler and permanent marker to draw a scale in millimetres on the side of the container. Leave it in an open area and check it after rainfall, or at the same time every day if there are a few rainy days in a row. Read the scale to see how many millimetres of rain has fallen. Be sure to empty the jar after recording the rainfall so it is ready to record the next



downpour. The container can be partially buried in the ground to prevent it falling over.

Milk bottle weathervane – Push the skewer down into the sand or dirt so it stands vertically. Cut out two sides of the milk bottle and fold the sides together. Use the marker to draw an animal shape, such as a fish, turtle, or shark. Cut out the shape with scissors and use a ballpoint pen to make a dent in the fold where the shape will balance. Place the shape on the skewer and leave it in an open area to catch the wind. You will need to know the cardinal directions: north, south, east, and west. These can be found by using a compass or a smartphone map app to find north.

Balloon barometer – Cut the neck off the balloon and stretch the round part of the balloon tightly over the top of the jar. Tape the flat end of the skewer to the balloon so the skewer is horizontal. Each day check the position of the pointy end of the skewer and mark it on the piece of cardboard.

Keep a record of your daily weather measurements in the table on the next page and compare them to the observations on the Bureau of Meteorology website: www.bom.gov.au



What's happening?

Official rainfall data is measured with a 203mm rain gauge, which consists of a round funnel that collects rain into a calibrated cylinder. Wind direction, wind speed and wind pressure are measured with an anemometer and the wind direction is named according to the direction the wind is coming *from*. For example, a wind blowing from the west to the east is called a westerly wind, and weather maps have arrows to indicate the direction the wind is blowing. A barometer measures atmospheric pressure, which is how much the Earth's atmosphere is pushing on everything, and it can be used to predict changes in the weather. The balloon barometer measures changes in air pressure: higher air pressure makes the tip of the skewer go up and lower air pressure makes it go down. Falling air pressure can indicate bad or changeable weather ahead.

Results

Fill in the table to compare your observations with the official observations. Search for local weather observations on the Bureau of Meteorology (BOM) website: www.bom.gov.au

	Date	Rainfall (mm)	BOM observation	Wind direction	BOM observation	Air pressure (high, medium or low)	BOM observation
Day 1							
Day 2							
Day 3							
Day 4							
Day 5							
Day 6							
Day 7							

Did you know?

Seven-day weather forecasts are fairly accurate but forecasting further into the future is a lot less reliable. Weather forecasting is a complicated process that relies on past weather observations and mathematical modelling. Advances in computer power are making it possible to process huge amounts of data, and this could revolutionise weather forecasting and make it possible to more accurately forecast the weather for months into the future.

Extreme weather records from the Bureau of Meteorology:

Highest temperature 50.7°C, Oodnadatta Airport, South Australia, 2 January 1960

Lowest temperature -23.0°C, Charlotte Pass, New South Wales, 29 June 1994

Highest daily rainfall 907.0mm, at Crohamhurst, Queensland, 3 February 1893

Find out more

- Discover a wealth of information from the Bureau of Meteorology www.bom.gov.au
- Keep track of the weather with Weatherzone www.weatherzone.com.au
- Explore the Indigenous seasons calendar with CSIRO bit.ly/2zAEvlr
- Find out how climate change is affecting the weather <https://www.climatechangeinaustralia.gov.au>