## NATURAL RESOURCES

Activity NR05

**Theme**
Class activity (CA). Students build weather instruments to investigate the natural resources of sun, wind and water in their school grounds.

**Objectives**
To appreciate the sun, wind and rain as resources and learn how to observe and measure them.

**Curricular strands**
SESE, Geography–Natural environments; Weather, climate and atmosphere

SESE, Science–Energy and forces; Heat

SESE, Science and Geography–Environmental awareness and care

**Skills**
Questioning, observing, predicting, designing and making, identifying

**Time**
45–50 minutes to make; 20 minutes to set up

**Links to Green Schools**
Awareness of energy and renewable forms of energy.

# How's the weather?

## → BUILD YOUR OWN SCHOOL WEATHER STATION

### WHAT YOU NEED

- Wind sock: a black bin liner, a wire coat hanger, duct tape, broom handle, scissors, strong twine
- Rain gauge: several one litre plastic bottles, a ruler, a permanent black marker, several large plastic funnels
- Solar water heater: two old cereal bowls, black paint, a cereal box, aluminium foil, cling film, a thermometer

### WHAT YOU DO

1. Explain to the class that you are going to make a weather station to monitor the amount of wind, sun and rain in your school grounds.
2. In Ireland we get most of our electricity from fossil fuels (coal, oil, gas and peat). We burn these fossil fuels in power stations to produce electricity, but this also produces emissions of harmful gases. One important gas emitted is carbon dioxide, one of the gases causing climate change (the greenhouse effect).

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3 We can also get electricity from natural resources such as wind, water and sun.

4 We can build wind turbines to harness the energy of the wind and turn it into electricity; solar panels, to harness the heat of the sun to give us warm water and electricity; and hydroelectric dams, to harness the power of running water to give us electricity (for additional information visit www.sei.ie).

5 The class will investigate the natural resources that are available in their school grounds through a weather station, which will monitor the direction and strength of wind, the amount of rain and the heat of the sun.

5 Divide the class into three groups. Each group will be in charge of building one of the monitoring stations.

**Wind Sock**

1 With a pen, mark out a triangular shape on the bin liner. The triangle's base should be approx. 25cm wide and it should be approx. 50cm high.

2 Cut out the shape through both sides of the bin liner

3 Use duct tape to stick both sides of the bin liner together to make a cone shape

4 Unwind the coat hanger and bend it into a circular shape

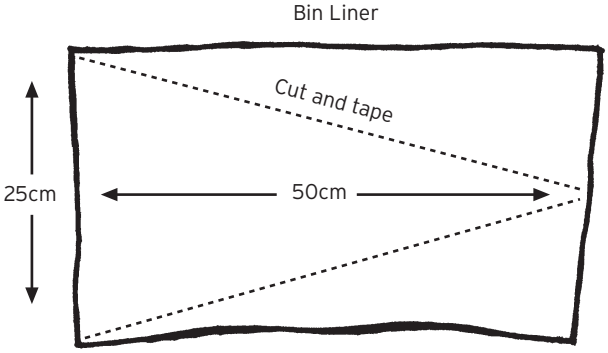
5 Fold the edge of the bin liner around the wire, and hold it in place with the duct tape

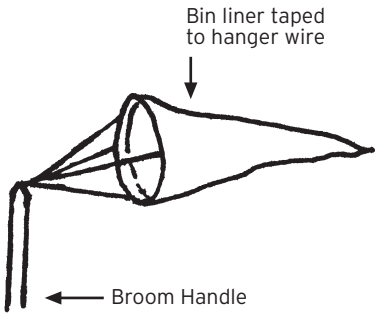
6 At four equidistant points attach some twine, measuring 25cm long.

7 Bring the four pieces of twine together and tie them into a knot. Attach this to the top of the old broom handle.

8 Secure the device in a windy area of the school yard and, with the use of a compass, monitor which direction the wind is blowing by recording the direction the wind sock is pointing towards at given times (e.g. every hour during a day, or at noon every day).

9 Wind direction is recorded as the compass direction that the wind is coming from, so for instance if the wind sock is pointing south-west, the wind is recorded as coming from the north-east.



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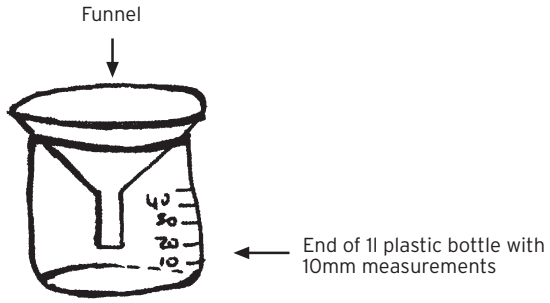
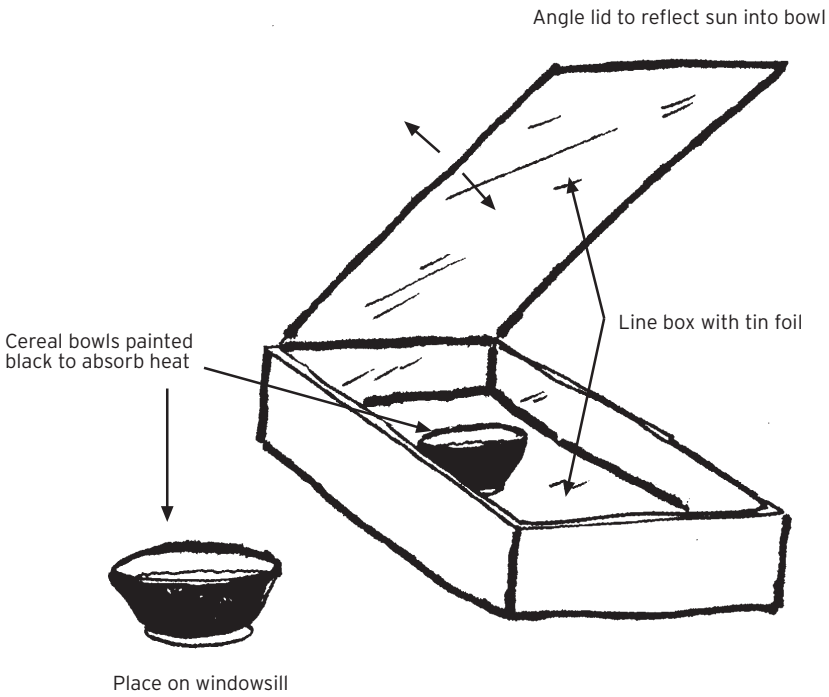



## Rain gauge

1. Cut the top off the one litre bottles and use a ruler to mark off measurements on the bottle at 10mm intervals. Number the bottles.
2. Place a funnel in each bottle and place the bottles in different locations around the school grounds–under trees, in fields and on window sills. Make sure the bottles are secure and record the location of each numbered bottle.
3. Leave the funnels for 1-2 weeks
4. Collect up all the rain gauges–perhaps different students could be in charge of different gauges
5. Read from the bottle the amount of rain water collected in mm, and record the location and the amount of water on a chart

## Solar Heater

1. Paint two cereal bowls black and leave them to dry
2. Seal the top and bottom of a cornflake box
3. Cut along three sides of the box to make a flap lid
4. Cover the inside of the box in aluminium foil
5. Place a small amount of water in each bowl
6. Place one bowl outside on a sunny window sill and record the temperature
7. Place the other bowl in the aluminium foil box and put this next to the first bowl. Angle the lid so it reflects the most sun onto the water in the bowl.
8. Take the temperature of the water and return to it after a few hours in the sun
9. Black absorbs the heat of the sun (try using a white bowl to see the difference!)
10. The homemade heater reflects additional heat into the black bowl inside it, thus improving the heating rate



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## Go further

Most larger toy shops sell weather station kits that are quite cheap and could be used in preference to making your own, but most students enjoy making the equipment, and it adds to the learning experience to do so.

More information on renewable energy in Ireland can be found at www.sei.ie, which also has educational resources for primary schools.