



This resource pack was created by Dr Rebecca Wilson
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Equipment

A0 Map of the UK

Range of weather symbols laminated and attached to blue tak

place marker for your home town

Laminated compass points with blue tak

Weather forecast for the following day

5 day history from <http://www.wunderground.com/> or readings from weather station

Thermometer

Jacob's ladder should you have one!

Instructions

Intro: what do we need weather forecasts for? It's not just to find out if there will be a "snow day" at School! Farmers rely on the weather for crop production, the work of builders, landscapers and engineers are all affected by the weather. As scientists the weather can affect the experiments we do, so it is important to log and monitor it.

Activity 1: Weather symbols and compass points

Using the laminated weather symbols, students are quizzed on what they all mean.

Test the students understand the compass points by asking them to put N, S, E and W on a laminated map of the UK.

Activity 2: Current conditions

Fill in the accompanying worksheet with the weather observations today. Some of these can be taken by looking out of the window.

Temperature (°C) lay the thermometer on a flat surface outside for 10 mins before taking the reading.

Rain log whether it is no rain, drizzle, rain or torrential/stormy rain.

Cloud cover log the amount of the sky covered by cloud. Either as a percentage or a fraction e.g. $\frac{1}{4}$ cloud cover.

Wind direction take a look at a weather vane (or make a weather vane - see <http://www.wikihow.com/Make-a-Wind-Vane> for instructions) to see which direction the wind is blowing in.

Activity 3: Meteorology stations

Explain that a weather station takes measurements that feed into the models to predict the weather forecast. Show the image of a working meteorology station, the learners guess what each sensor is. Primary school students should be able to identify 1,2,7 and 9.

1) wind direction, 2) wind speed, 3) satellite antenna, 4) pyranometer (solar radiation), 5) air temperature and relative humidity, 6) GPS antenna, 7) solar panel, 8) data logger and batteries, 9) rain gauge, and 10) snow depth.



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Activity 3: Trends in weather conditions

Use local meteorology station data (or data from www.wunderground.com) from the past 3 days to quantify present wind speed, wind direction and temperature. On closer inspection of the data from the meteorology station, learners should be able to notice a daily pattern for temperature (day and night). They should also be able to identify that over the three previous days the wind speed and day time temperature doesn't fluctuate too much.

Activity 4: Weather forecasting

Split into two teams - learners use their present observations from Activity 2 and the meteorology station data to model (predict) what the weather will be the following day. Each team places the weather symbols of their prediction on the map. Teams are marked against the UK Met Office weather forecast.

Activity 5: Jacob's Ladder: Lightening in a Box

Switch it on. Watch what happens.

[NB: High Voltage – do not put hands inside the apparatus – electrocution hazard, do not put items inside the apparatus – fire hazard! Do not leave running, switch off after use]

Two electrodes diverge. On application of high voltage a spark forms across the gap, changing into an electric arc. Heated ionized air rises, carrying the current path upwards with it. As the trail of ionization gets longer, it becomes more and more unstable, finally breaking. The voltage across the electrodes then rises and the spark re-forms at the bottom of the ladder.

CONTEXT:

When the clouds and the Earth surface accumulate enough opposite charges, the extremely high potential difference causes air to be ionized and conduct electric current, This process gives out a huge spark as **lightning**.