What is the weather like and how do we record it?

Royal Geographical Society with IBG

Advancing geography and geographical learning

A school grounds based weather study

Learning Objectives

- To find out what the weather is in your school grounds (or local area).
- To use different weather instruments to record information about the weather.
- To look at how weather varies at different times (e.g. daily, weekly, seasonally) and in different places.

National Curriculum for Geography

Key Stage 1

Place Knowledge: understand geographical similarities and differences through studying the human and physical geography of a small area of the United Kingdom, and of a small area in a contrasting non-European country

Human and physical geography: identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles. And use basic geographical vocabulary to refer to … season and weather

Geographical skills and fieldwork: Use simple compass directions (North, South, East and West) and use simple fieldwork and observational skills to study the geography of their school and its grounds and the key human and physical features of its surrounding environment.

Key Stage 2

Place Knowledge: understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America

Human and physical geography: describe and understand key aspects of … climate zones … and the water cycle

Geographical skills and fieldwork: use the eight points of a compass (and) use fieldwork to observe, measure, record and present the human and physical features in the local area using a range of methods, including sketch maps, plans and graphs, and digital technologies.

This unit of work also supports links with art, English, mathematics and science.

Activity overview

This unit of work will provide your pupils with:

- an overview of the key elements of weather
- an introduction to the different instruments which are used to record the weather

- fieldwork opportunities within your school grounds (or local area) to observe and record the weather
- different ways of presenting and analysing the pupils' data to understand how weather varies over time and in different places.

Key vocabulary

The following geographical terms should be used and reinforced through this unit of work:

- *Weather*: the atmospheric conditions we experience in a place at a point in time. As we are all too familiar in the UK our weather changes frequently.
- *Season*: is a division of the year, marked by average changes in the weather. In the UK these are named as spring, summer, autumn and winter
- *Climate*: this is the averaging out of weather conditions over a period of years (usually over 30 years), which provides an indication of the type of weather you might experience in a particular place at a certain time of year. In terms of the difference between weather and climate - Climate is what we 'expect'. Weather is what we 'get'.
- *Temperature*: is the measure of how hot or cold an area is.
- *Wind direction*: is the direction from which the wind is blowing.
- *Wind speed*: is a measure (in mph) of how fast or slow the wind is blowing.
- *Precipitation*: is the amount (in mm) and form in which water falls (rain, hail, sleet and snow).
- *Cloud types*: Clouds form many different shapes and sizes. However, they can be broadly categorised into the following types:
    - Stratus: layers of cloud, at relatively low altitudes,
    - Cumulus: classic 'fluffy' clouds at middle altitudes and there are different types of cumulus clouds including cumulonimbus or storm clouds
    - Cirrus: wispy clouds at high altitudes

There are also a wide range of other terms which pupils can use to describe and record different elements of the weather. These include:

Temperature	***Wind***	***Precipitation***	***Seasons***	***Clouds***
Hot	Windy	Wet	Autumn	Overcast
Cold	Calm	Rain	Winter	Cloudy
Dry	Gusty	Snow	Spring	Clear
Warm	Breeze	Hail	Summer	Cirrus
Frosty	Light winds	Fog or mist		Grey
Icy	Storm	Dew		Stratus
Cool	Gale	Drizzle		Cumulus
Sunny		Showers		Thin
Freezing		Blizzard		Heavy
		Thunder or lightening		Cumulonimbus/ Thunder clouds
		Sleet		

You will find these elements on weather forecasts provided by the Meteorological Office (www.metoffice.gov.uk) and the regular weather reports on the BBC and other broadcasters, for example the following five day forecast for London for Tuesday 2nd September 2014:

www.bbc.co.uk/weather/

Weather Observation

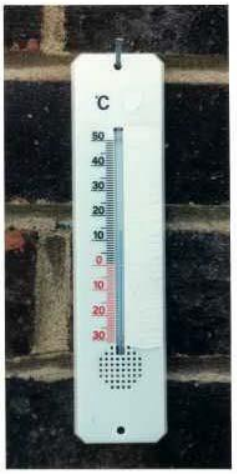
You may choose to observe the weather as a whole class activity, in groups or ask individual pupils to record their observations on different days or at different times. Do try and use the appropriate vocabulary and if you select pupils to undertake weather observations daily and feedback their 'forecasts' to their class do describe them as 'weather forecasters' or 'meteorologists' (rather than as weather men or women).

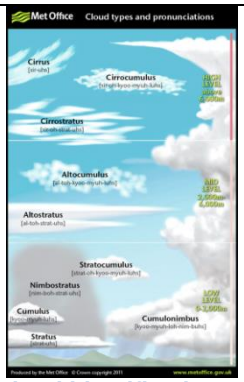
This work can be undertaken as a stand-alone topic and also provide materials to compare the weather of your local area to the rest of the UK and the non EU contrasting locality you may study at Key Stage 1 or the other place studies (the UK, Europe and North and South America) studied at Key Stage 2.

Your pupils will need to record the following:

- Temperature
- Wind speed and direction
- Precipitation
- Cloud type and altitude
- And any other weather features e.g. a rainbow

The instruments you can use to record the weather are:

Thermometer	Temperature	The thermometer will give a temperature reading in ˚C. These will usually be positive reading, but can fall to minus figures (below freezing) during winter. More advanced 'maximum and minimum' thermometers will provide you with a maximum and a minimum temperature if left in the same location over a period of time e.g. over 24 hours.	 A thermometer © RMetS

Anemometer	Wind speed	Getting a reading from this instrument varies with what model you use. Most models will have a dial that spins and gives a reading in mph. Others will provide a digital read out.	 An anemometer
Wind vane	Wind direction	This instrument can be read by looking at the direction in which the arrow is facing. The wind vane points in the direction in which the wind is blowing from. You may also need a compass to identify the compass direction.	 A simple wind vane © RMetS
Rain gauge	Precipitation	It is best to leave a rain gauge for a 24 hour period so that your pupils can record the amount of precipitation (in mm) that has fallen (or not) over this period.	 A rain gauge © RMetS
Cloud observation		Clouds can be categorised into their main types and pupils may wish to sketch the types of clouds they observe. Please see the full sized cloud identification guide below.	 Cloud identification © Met Office

Electronic weather station	Monitors Temperature, Dew Point, Barometer and Humidity	Electronic weather units enable us to detect how the weather is changing. The principle is exactly the same in that we know that when the air pressure drops the weather is going to decline and if the air pressure goes up it's going to get better.	

Note:
The Royal Metrological Society provides additional guidance for weather observation and also instructions for how you can make your own weather instruments. (See further information below)

Electronic weather stations are also available and relatively reasonably priced, which can record much of the above information and provide an ongoing daily update in live time.

Weather recording sheet

You may wish to record the weather at different times during one day, at the same time over a period of days or at different times of the year during different seasons.

Choose the most appropriate range and types of collection based on the ability of your pupils, the amount/type of equipment you have available and the time you have to complete this fieldwork. You may also wish to take photographs of your pupils using the different instruments for a class display.

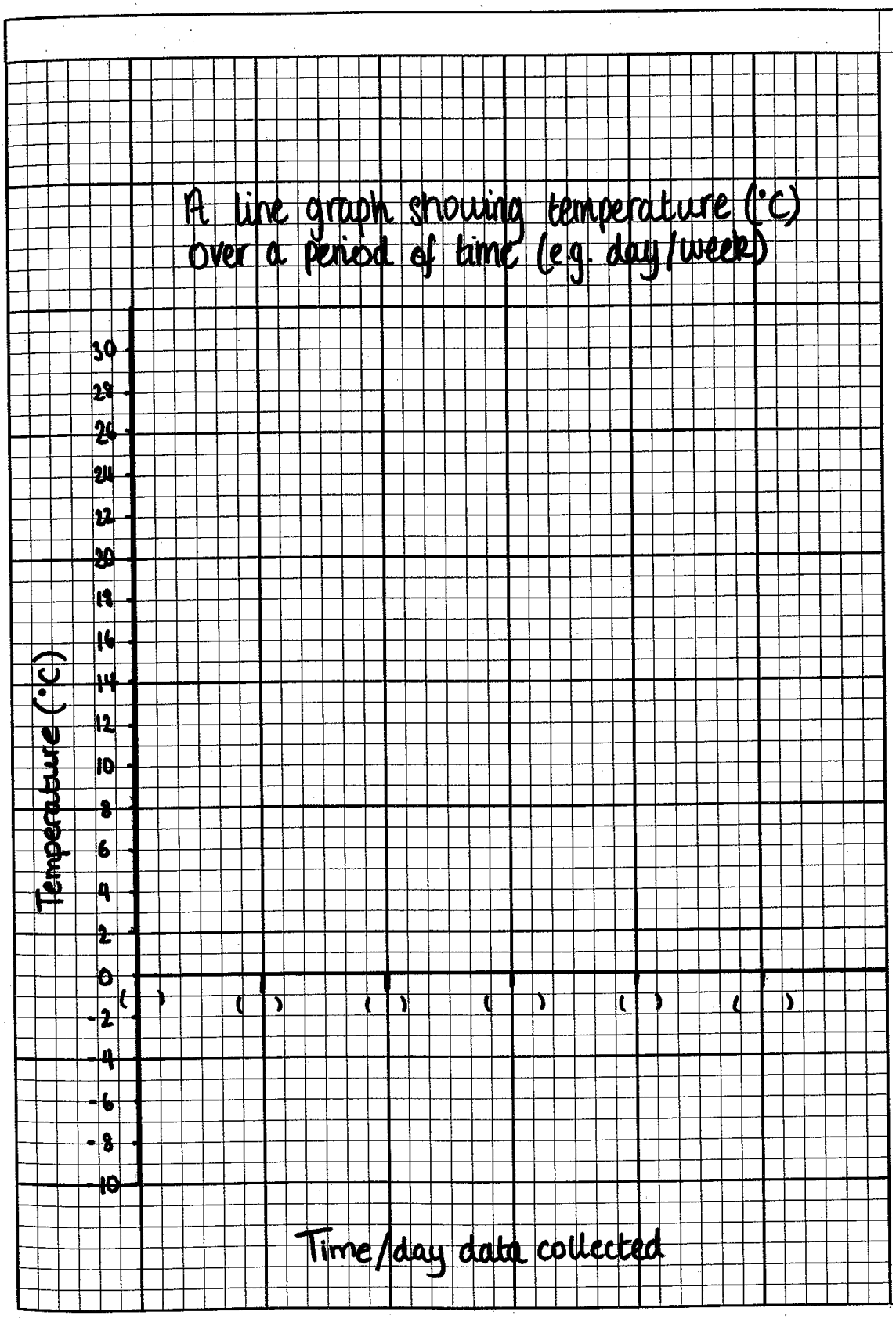
You can adapt the table below for your pupils to record their observations.

	Temperature	Wind speed	Wind direction	Precipitation (the amount and also the type e.g. rain, hail, snow)	Cloud type and altitude (e.g. low, medium or high)	Additional notes (e.g. any special features such as a rainbow etc)
Sample 1. Time (if recordings are only being made for one day) or date (if recordings are being made over a longer period)						
Sample 2.						
Sample 3.						
Sample 4.						
Sample 5.						

In terms of a 'fair test' it is better for pupils to use the same points around the school to make their weather recordings. For example, recording in a shady or exposed part of the play-ground will influence the temperature recordings; a rain gauge should always be located away from any overhanging trees or other obstructions and buildings can also 'funnel' wind into certain directions or affect its speed.

Presenting your weather information

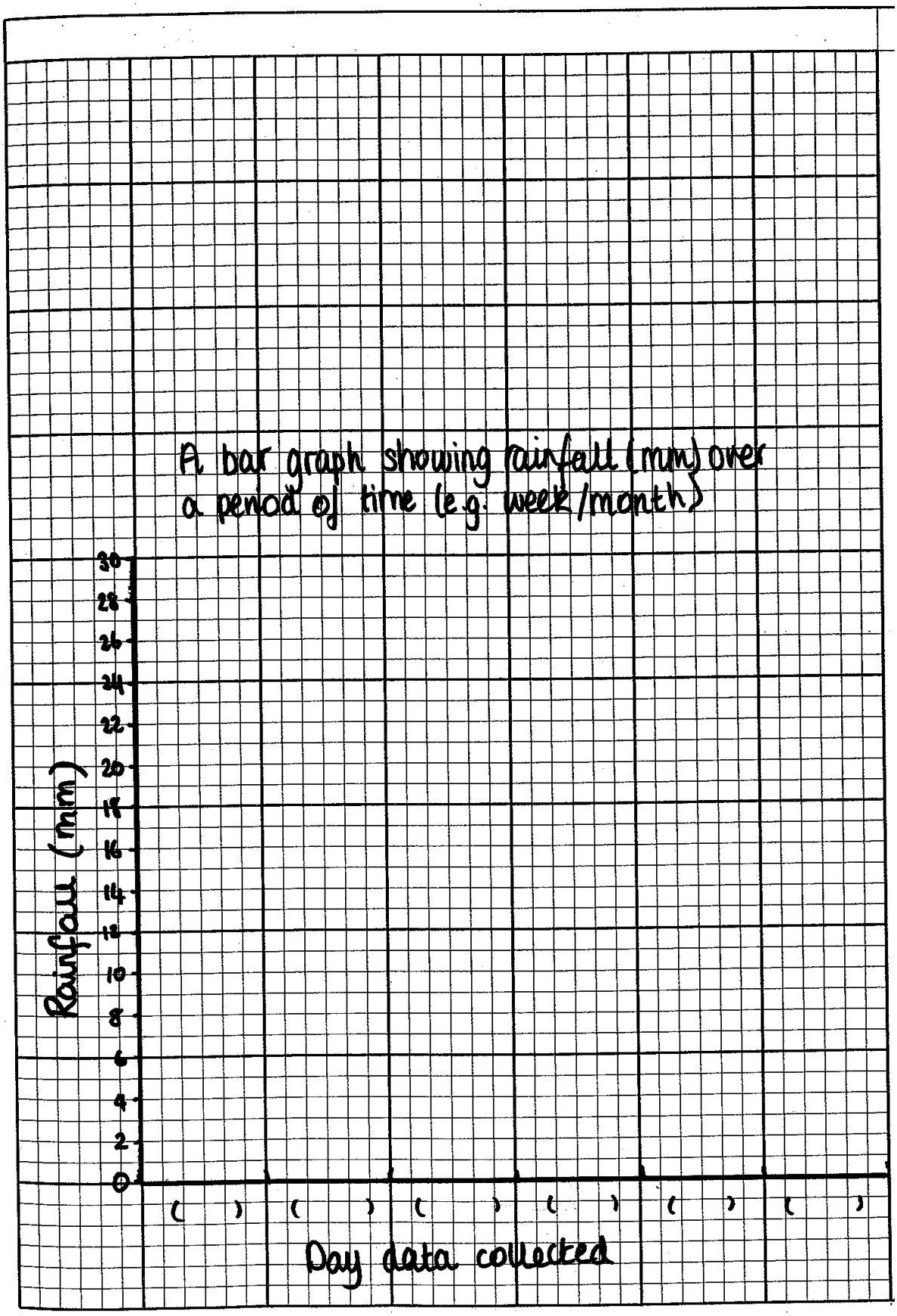
Your pupils can present their information in many different ways including in their workbooks, as a class display or as their own daily (or seasonal) weather forecast. Your presentations might include:



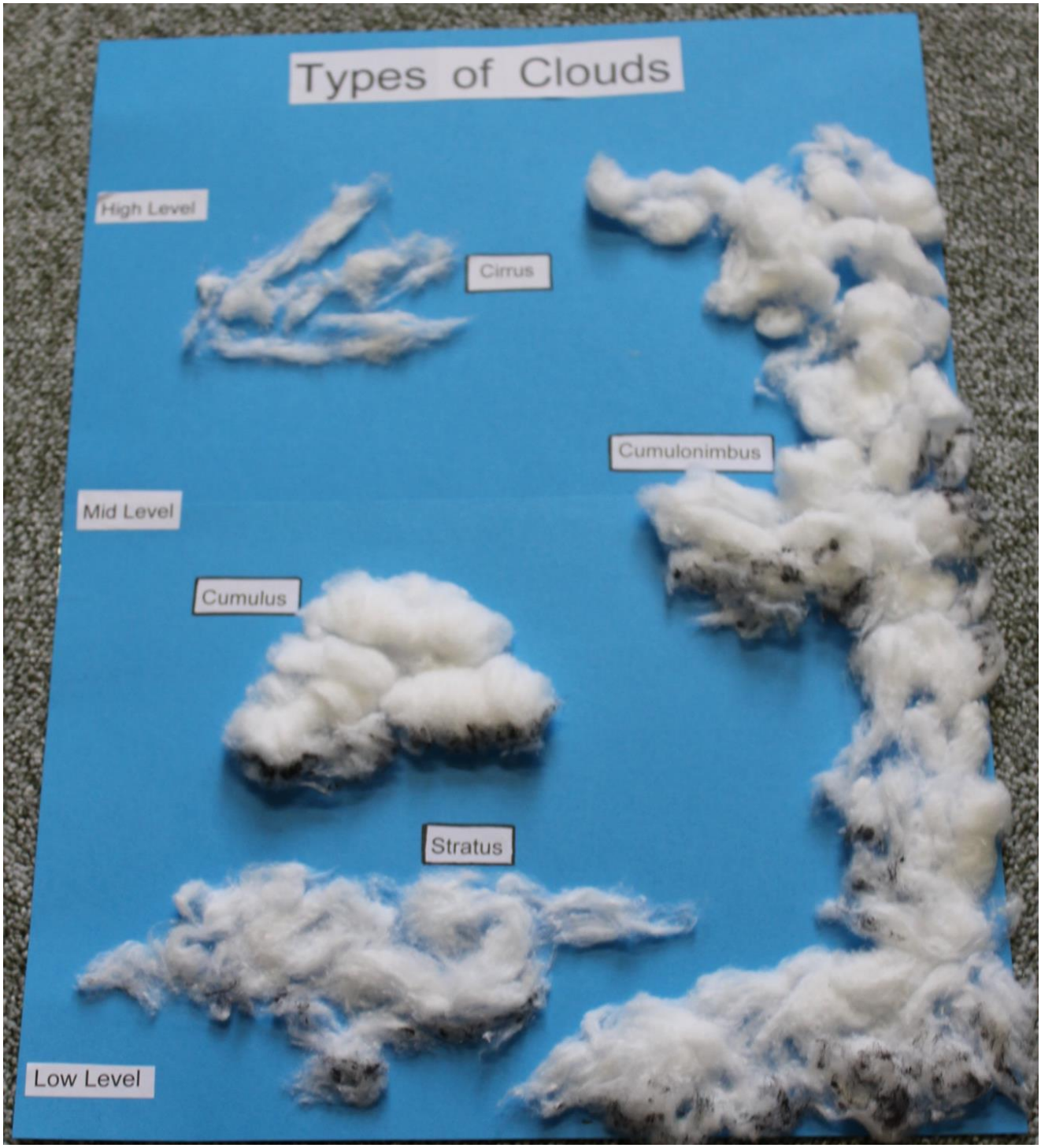
1) A line graph showing the temperature °C differences over a period of time, such as over a

school day, on different days of a week or during the different seasons.

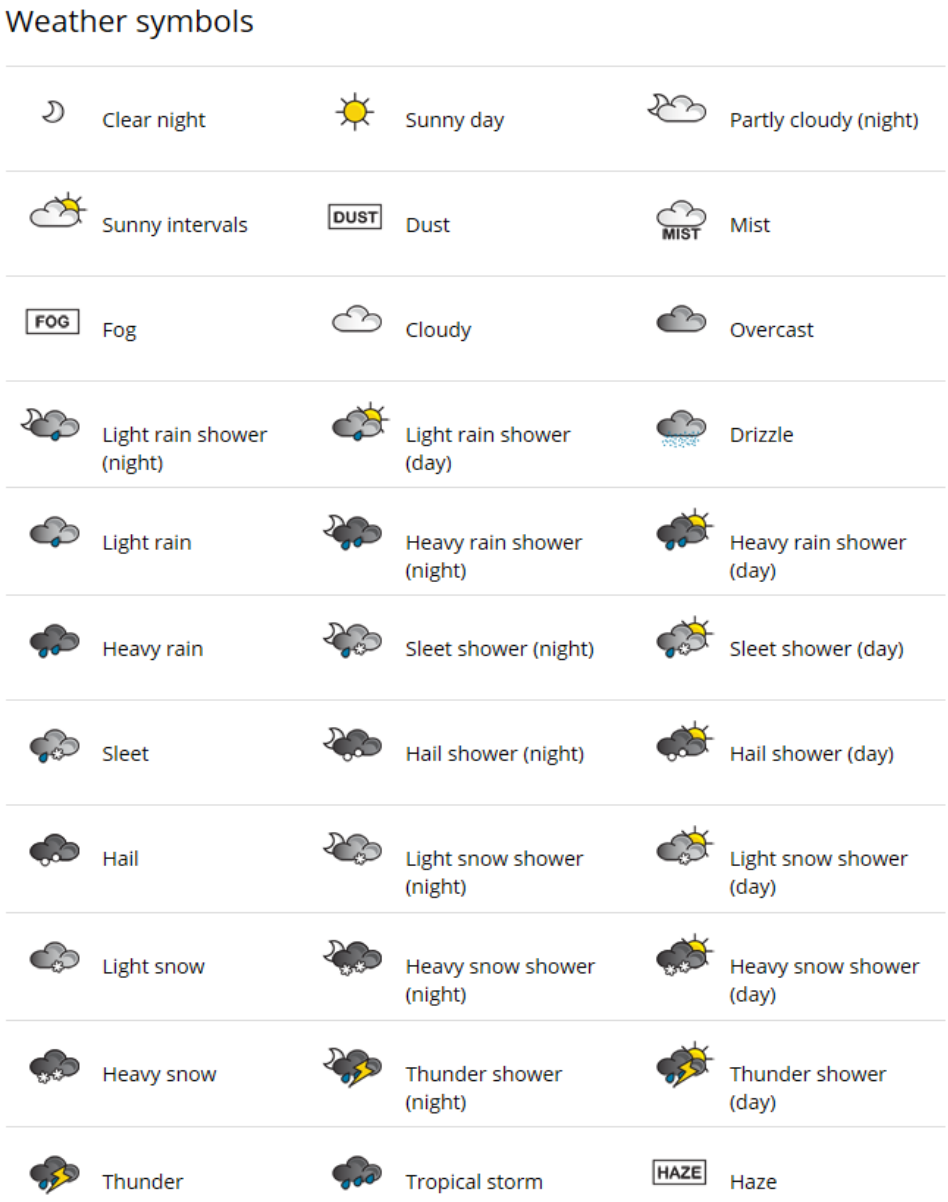
2) A bar graph showing precipitation (rainfall) mm over different periods of time.


A bar graph showing rainfall (mm) over a period of time (e.g. week/month)
Rainfall (mm)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Day data collected

3) A record of the clouds which were observed recreated using cotton wool on blue paper to illustrate the different types of clouds the pupils noted. Do encourage your pupils to represent the actual different cloud types they see, rather than just make lots of 'fluffy clouds'!



4) Present a weather forecast for a day using different symbols to represent the different features of the weather based on the information they have collected. Or maintain a daily weather board in your classroom. You might also add to this board the weather for some of the other places you are studying in geography to illustrate similarities and differences. The following symbols are those used by the Meteorological Office www.metoffice.gov.uk/guide/weather/symbols#weather-symbols or pupils might design their own symbols for the relevant elements of the weather.



5) Create a presentation or weather “round up” of the weather data that has been collected. This can include cloud sketches, graphs, site observations, photographs and pieces of writing or poems that they may have written (do use any written work to reinforce geographical vocabulary).

6) List and explain how the seasons and their associated weather affect our lives (choose between activities, clothing, food types, animals and even daylight hours, etc). How does the weather affect peoples’ lives in other parts of the world your pupils have studied? How does our local area change with the different seasons e.g. the falling of autumn leaves or

sprouting of spring buds and how people use their local areas for different activities at different times of year.

7) Compare the weather you have observed and the UK's climatic conditions to the major types of climatic zones. This interactive provides an overview of the earth's climatic system http://www.rgs.org/webcasts/activities/climate_system.html which may be helpful as background for your own subject knowledge.

Useful links

- The Royal Geographical Society. For school subject based resources: www.rgs.org/resources
- Royal Meteorological Society. For an overview of weather observation see this link http://www.rmets.org/sites/default/files/pdf/simweameasurements.pdf and for detail of how to make your own simple instrument and also suppliers see http://www.rmets.org/weather-and-climate/observing
- Meteorological Office www.metoffice.gov.uk/
- London Grid for Learning. Access to online weather stations across London providing live updates of their local weather http://weather.lgfl.org.uk/
- The Field Studies Council provides informative and educational opportunities for people of all ages to better understand the environment: http://www.field-studies-council.org/

Additional resources

Cloud identification - http://www.metoffice.gov.uk/learning/clouds/cloud-spotting-guide