

This is a one-day unit of study.

**Summary of the Day**

- 0900 Classroom-based work
- 1000 Outdoor tasks
- 1030 Children now work in/out of doors
- 1130 Visit to a high point
- 1230 Lunch
- 1330 Tasks continue in/out of doors
- 1700 End of activities  
Extension tasks

**This is a practical science and geography task.**

RED RIDGE

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## Introduction

This one-day study of the weather is to assist in studying how weather varies between places and over time. A study of the weather at Red Ridge can be carried out alongside a study based on the local environment of the school

## Overview

Weather may be broken down into constituent elements. Of these the main areas are:

- wind strength - measured using an anemometer
- wind direction - observed using a wind vane;
- atmospheric pressure - using a barometer;
- temperature - measured using a thermometer;
- rainfall - measured using a rain gauge;
- humidity - measured using a hygrometer
- cloud - cloud cover can be estimated using a cloud meter;
- visibility - can be estimated by referring to how far one can see.

Any study of weather at this level should include most of the above.

Water evaporates from the sea, rivers and lakes on the Earth's surface and rises into the sky where it condenses into tiny water droplets. A collection of these droplets may form tiny ice crystals. Although the season generally dictates at what level ice droplets form, a general rule is that the higher the cloud the greater the chance of ice crystals. There are three distinct groups of cloud: low, medium and high; and two distinct types: those which develop heaps and those which form layers. When tiny water droplets or ice crystals become large enough they drop to the Earth as rain, hail or snow depending on the temperature.

The Earth's atmosphere exerts a pressure on the Earth. The atmospheric pressure is measured using a barometer. The pressure of the atmosphere is reduced when there is more water vapour present. Therefore, when the atmospheric pressure is seen to fall there is more water vapour around and so there is more likelihood of rain.

Weather stations around the Earth note atmospheric pressure and pass the information to the weather centres. Weather maps are drawn up and lines, called isobars, which join points of equal atmospheric pressure are entered. Movements of air from areas of high pressure to areas of low pressure is called wind. When there is a large change in air pressure over a small area, we get strong winds; this is shown on a weather map by the isobars being close together.

Visibility can be estimated using an Ordnance Survey Map to locate landmarks around the viewing point and applying the following criteria:

- If a landmark 400 metres away cannot be seen - visibility is **very poor**.
- If the first landmark can be seen but one 5 km away cannot, visibility is **poor**.
- If the first two landmarks can be seen but one 10 km cannot, visibility is **moderate**.
- If all three landmarks can be seen, visibility is **good**.

**Aims:** The aim of this study is to see:

- how site conditions can influence the weather;
- how weather conditions can affect a locality.

### **Organisation**

This is a one-day whole class activity. This activity allows children to work in pairs and small groups.

**Resources**

- Electric kettle
- Clear polythene bags and twists for sealing them
- Grass, leaves, soil, sand, pebbles
- Clipboards
- Wind vane and measuring device for speed and strength
- Thermometer
- Scissors, glue, string, and light materials (to make wind sock)
- Weather maps with symbols of the area
- Card to make cloud recorders

**Time** This is a one-day study.

### **Method:**

- 1 *Indoors* Introduce the study

Under your close supervision, arrange for the children to observe a cloud of 'steam' from a boiling kettle. Ask them to look closely at the spout - there is a clear area before the cloud starts which is in fact steam, an invisible gas. The cloud we see is of tiny droplets of water just like a real cloud.

Ask:

  - What do you think the cloud is made of?
  - What is happening to it?
  - Can we bring the water back?
  - How?
  - Can you think of other ways of making clouds?
- 2 You will now ask the children to find out where some of the water that goes to make clouds comes from. Provide them with clear plastic bags and twists for sealing them plus sand, stone, pebbles, grass, leaves etc. (Make sure the inside of the plastic bags are dry). Ask the children to work in pairs and to place their objects in separate bags and seal them. In addition, ask one child to blow into a plastic bag and seal it. Seal an empty bag too. Place the plastic bags in a cool place. The children will return later to observe and look for water that has condensed.
- 3 Ask the children to make cloud recorders. This is the grid which can be fixed to the window and the amount of the grid which is covered by cloud is noted regularly.
- 4 *Outdoors*

Arrange the children into groups to go outside to observe the clouds and to record their observations, describing the clouds and how they move. Can they find a link between the type of clouds observed and the resulting weather?
- 5 Ask the children, in their groups, to record the wind speed, strength and direction, each hour.

- 6 Ask the children to record the outdoor temperature in the shade and in the sun now, again at 12.00 noon and again at 3.00 pm.
- 7 Take the children to a high point and estimate visibility. You will need to have identified some landmarks at suitable distances from the viewing point before taking the children out - this can be done using an OS map, as suggested in the overview.
- 8 Return to the Centre and carry out observations and recording of cloud, wind temperature (as 4, 5 and 6 above).
- 9 *Indoors*  
Note cloud cover on cloud recorder.
- Discuss the use of a wind sock at airfields. Challenge the children, to work in pairs, and construct an effective windsock.
- What kind of materials will they need?
- How will the sock be suspended so that it blows freely?
- 10 *Outdoors*  
Test the wind socks
- 11 Carry out observations and recordings of cloud, wind and temperature.
- 12 *Indoors*  
Note cloud cover on cloud recorders.
- The children should now work in their groups to devise a chart, which will record their three sets of observations. They should now discuss how the site conditions influence the weather.
- 13 Ask the children to look at the weather map of the area and to predict what the weather is like at Red Ridge in December and August. What effect do they think the weather has on the locality.
- 14 Return to the plastic bags, stored in a cool place, observe and look for water that has condensed. Discuss together.

### **National Curriculum References**

Geography	1b, c, 2a, b, c 3a, b, c 4 5b 8a, b
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### **Extension Activities**

- Discuss how effective the weather symbols, used for forecasting, are. Can the children think of ways to improve them? Can they design and make a set of symbols to show rain, sunshine, cloud, fog, etc.
- Ask the children to write down as many weather sayings, poems, etc as possible. Which of these have any substance?