

Wind – the story for teachers

Where does the wind come from?

Any horizontal movement of air is known as wind. Wind is the result of differences in air pressure; air will move from areas of high pressure to areas of low pressure. At a simple level, heating causes air to expand and rise creating an area of low pressure. Air from surrounding areas moves in to fill this space. This movement is wind.

Differences in pressure are shown on maps by isobars. These are lines joining places of equal pressure and are measured in millibars. The closer together the isobars the greater the difference in pressure and the stronger the wind. More extensive weather forecasts often contain a map with expected isobars and will allow you to anticipate the strength of the wind on the following day.

Coastal areas are sometimes affected by land and sea breezes: these are phenomena that later years might like to explore.

Measuring the direction and the speed of the wind

The wind is always named from the direction from which it blows. Drawing or painting a large compass on the school playground can be really useful, and will give children a constant reminder of direction. When measuring the wind it is important to take the children to the most convenient open space so as to estimate the true direction and speed, since trees, hedges and buildings can influence direction and speed – an interesting case study for later years.

Wind speed is accurately measured using an instrument called an anemometer. The Beaufort wind scale, below, describes different conditions of wind. A version to use as a classroom display is included in the activity download

New words

wind – the movement of air from high pressure to low pressure

anemometer – an instrument used to measure wind speed

wind sock – an instrument used to measure wind direction

air pressure – the weight of the atmosphere pressing down on the earth

Beaufort scale – a chart used to describe wind conditions

Beaufort scale

Wind force	Description	Wind speed)		Specifications
		kph	knots	
0	Calm	0	0	Smoke rises vertically.
1	Light Air	1-5	1-3	Direction shown by smoke drift but not by wind vanes.
2	Light Breeze	6-11	4-6	Wind felt on face; leaves rustle; wind vane moved by wind.
3	Gentle Breeze	12-19	7-10	Leaves and small twigs in constant motion; light flags extended.
4	Moderate Breeze	20-28	11-16	Raises dust and loose paper; small branches moved.
5	Fresh Breeze	29-39	17-21	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	Strong Breeze	40-50	22-27	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7	Near Gale	51-61	28-33	Whole trees in motion; inconvenience felt when walking against the wind.
8	Gale	62-74	34-40	Twigs break off trees; generally impedes progress.
9	Strong Gale	75-88	41-47	Slight structural damage (chimney pots and slates removed).
10	Storm	89-102	48-55	Seldom experienced inland; trees uprooted; considerable structural damage.
11	Violent Storm	102-117	56-63	Very rarely experienced; accompanied by widespread damage.
12	Hurricane	118+	64+	Devastation.

Wind – lower primary

By using a range of materials and activities, we aim to focus on these outcomes and targets:

Pupil Learning Outcomes

- Wind is the movement of air from areas of high pressure to areas of low pressure.
- The greater the difference in pressure, the stronger the wind.
- Wind always blows from high to low pressure.
- Wind speed can be measured using an anemometer.
- Wind direction can be measured using a wind sock.

Scotland: 5–14 Environmental Studies

People and place: The physical environment

- Level A: describe the main types of local weather, including seasonal change, and how it affects their own lives.
- Level B: describe main weather elements and some effects on people's everyday lives.

Skills in science – investigating

- Level A: make suggestions and contribute to the planning of simple practical explorations.
- Level A: carry out simple observations and measurements.
- Level A: answer simple questions about what happened.
- Level B: use simple equipment and techniques to make observations and measurements.
- Level B: make suggestions about what might happen.

Skills in social subjects – enquiry

- Level A: process/classify simple information.
- Level A: suggest ways of finding answers to given questions.
- Level B: process/classify simple information in a variety of ways.

England and Wales National Curriculum

Geography

Key Stage 1

- 1b: observe and record
- 2a: use geographical vocabulary
- 2b: use fieldwork skills
- 4b: recognise changes in physical and human features
- 7a: study at a local scale
- 7b: carry out fieldwork investigations outside the classroom

Science – scientific enquiry

Key Stage 1

- 1: know that it is important to collect evidence by making observations and measurements when trying to answer a question.
- 2c: think about what might happen before deciding what to do.

Science – materials and their properties

Key Stage 1

- 2a: find out how the shapes of objects made from some materials can be changed by some processes, including squashing, bending, twisting and stretching.
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WALT

We are learning to ...

Describe wind and understand where it comes from.

Measure wind speed and direction.

Phase 1 Overview

Establish the children's prior knowledge:

- What is wind?
- Where does it come from?
- How does it feel?

Phase 2 Input

Read the children a story about a windy day. Some suggested books are:

- *Chimp and Zee and the Big Storm* by Catherine and Laurence Anholt, ISBN 1 845070 69 0
- *The Windy Day* by Debbie Foster, ISBN 1 858542 74 X
- *One Windy Wednesday* by Phyllis Root, ISBN 0 744554 61 6
- *A Windy Day* by Laura Pegram, ISBN 0 863162 18 5

Demonstrate to the children how you can make wind artificially, by blowing up a balloon and letting the air rush out. Explain to them that the air inside the balloon is all squashed up together, and, when we release the end, it rushes out into the surrounding air. The air inside the balloon is under high pressure and the air outside the balloon is at a low pressure. Wind always moves from high pressure to low pressure.

Take the children out into the playground. Ask them to stand close together like the 'high pressure' air inside the balloon. Then shout 'release' and ask them to run away from one another and stand in a 'low pressure' space.

Use a compass and chalk to draw north, south, east and west on the ground. Now hand out some bubbles and ask the children to blow them in order to work out which way the wind is blowing. Ask them to point to where the wind is going. Now ask them where it has come from. Remodel the high to low pressure idea by repeating the release experiment so that the children are running in the direction of the wind.

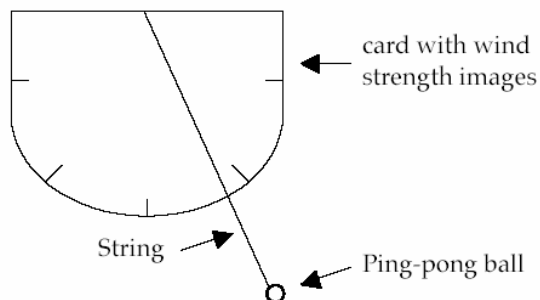
Explain to the children that weather forecasters always tell you where the wind has come from. It helps us to work out if it is going to be a warm wind (when it comes from the south) or if it is going to be a cold wind (when it comes from the north).

Phase 3 Process

The children are going to be taking part in a number of activities. You can show the children the photographs of a kite, wind sock, wind vane and ventimeter (device for measuring wind speed) (activity download) as preparation for the activities.

Anemometer

This activity demonstrates to the children how we can measure wind speed.



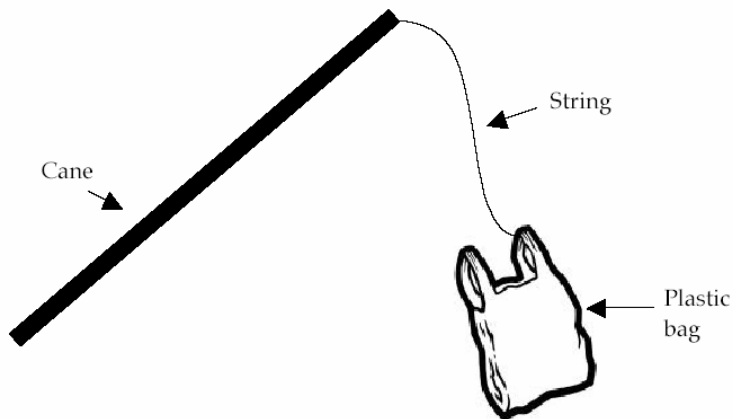
Provide the children with anemometers as in the above diagram. The children should draw pictures on the card at the appropriate places to show their idea of a visual 'scale' of wind speed (e.g. strong wind = bent tree). The string (with ball attached) should be taped to the card. The children should then go outside and test the strength of today's wind.

Wind sock

This activity demonstrates to the children how to measure wind direction.

Each group needs the following:

- a cane
- 50 cm of string
- a plastic bag
- sticky tape
- a compass
- chalk



Assemble the wind sock as in the diagram. The children should go to the playground to test the wind direction. Draw a simple compass on the playground (North, South, East and West) and hold the cane in the middle. Ask the children to decide where the wind is blowing to (the direction of the bag) and ask them where it has come from.

Wind testing

Provide the children with a number of items to make wind:

- a hairdryer
- an electric fan
- straws to blow through (one each)
- a hand-held fan

Tell them to use a number of things to try to test the wind strength, such as:

- their own faces
- leaves
- a plant
- a hat
- a flag
- a toy car

Ask them to try testing the different strengths of wind and work out which method of making wind is the strongest and which is the weakest. You can use the Wind testing worksheet (activity download).

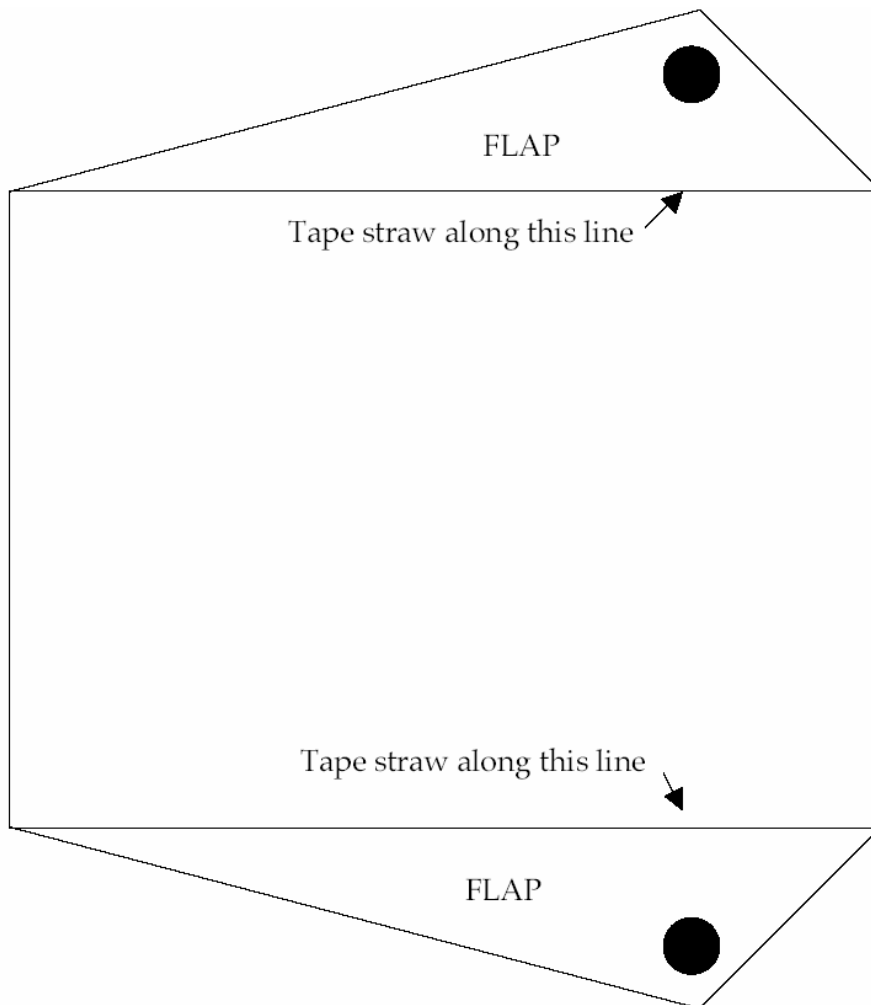
Kite

This is a fun activity which will allow the children to investigate wind speed and wind direction.

What you need:

- paper
- string (1 x 200 cm, 1 x 10 cm)
- a hole punch
- sticky tape
- two straws

Use the template below to cut out copies of the kite.



Put several layers of sticky tape (6 or 7) on the flaps before the hole is punched. This helps to strengthen the paper before its flight. Tape the straws to the kite. Tie the small (10 cm) piece of string between the two holes. Find the middle of this string and tie the 200 cm piece of string to it.

Phase 4 Review

Points for discussion:

- What is wind?
- Where does it come from?
- How can we measure its speed?
- How can we measure its direction?