



# Strong air Weather

### time

40 minutes  
(day 1),  
5 minutes  
(day 2) & 15  
minutes (day 3)

### learning outcomes

To:

- know what air pressure is
- know that you can use a barometer to measure air pressure

### end product

- a barometer

### materials needed

- 24 containers
- 24 plastic containers, e.g. plastic cups
- 24 balloons
- 24 drinking straws
- glass
- water
- postcard
- washing-up bowl
- scissors
- cardboard
- felt-tip pens
- glue
- sticky tape

## Preparation

For the activity **How strong is the air?** you will need the glass, water, the postcard, and the washing-up bowl.

For the activity **Make your own barometer** you will need a container for each child containing a wide-mouthed glass jar, a balloon, a drinking straw, scissors, cardboard, felt-tip pens, glue, and sticky tape.



## How strong is the air? 15 min.

Fill the glass to the brim with water. Make sure that the rim of the glass is also wet. Take the postcard and place it on the glass.

Ask the children what they think will happen if you turn the glass upside down. Now quickly turn the glass upside down. The postcard 'sticks' to the glass. Ask the children if they think the postcard on the underside of the glass is concave or convex. Invite one of the children to feel it. The postcard feels like it is caved in (concave). Explain that this is because of the air pressing against it. The postcard is not really 'hanging' on the glass; it is being pushed against the glass by the air. Explain that the air around us is also pushing against everything, from all sides. We don't notice this at all. Explain to the children that you can measure how hard the air is pushing; we call this air pressure. We measure this using a barometer.



The children investigate how you can measure air pressure using a barometer.

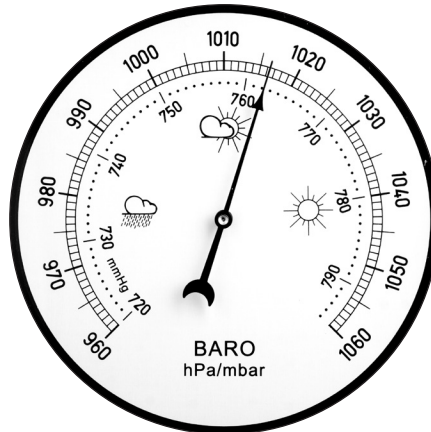
### Good to know.

Every square centimetre (that is one square on a sheet of squared paper) is subject to one kilogramme of air pressure. That means that an average adult body is subject to air pressure equivalent to the weight of two elephants!



## Make your own barometer 20 min.

Show the children the picture of the barometer below. Explain to them that they are going to make their own barometer. Give each child a container with the materials they will need. The children follow the instructions in [Task 1](#) on the worksheet.



## Measuring with your barometer 5 min. (days 1 to 3)

The children complete [Task 2](#) on the worksheet. Explain to the children that they will be measuring the air pressure today, tomorrow, and the day after tomorrow.



## How does your barometer work? 10 min. (day 3)

The children have kept a record of the changes in air pressure. What did they observe? Ask if they know how the barometer works. Explain that in the barometer they have made, when the air pressure is high (we call this a high-pressure area) it presses more strongly against the balloon seal so that it dips, causing the end of the straw to go up. When the air pressure is low (we call this a low-pressure area or depression) the pressure in the glass is higher than the air outside and the balloon seal puffs up, causing the end of the straw to go down. A low-pressure area often means rain and a high-pressure area often means good weather.

Ask if anyone knows what a barometer is used for. Explain the link between the changes in the barometer and the weather. Explain that a barometer is also used by the people who predict what the weather will be like (weather forecasters).

The children complete [Task 3](#) on the worksheet.

**Good to know.** The upper layers of air are colder than the lower layers. Air comprises high-pressure and low-pressure areas. Air flows from the high-pressure areas to the low-pressure areas. The colder air from the high-pressure area descends and becomes a little warmer. Warmer air can hold more water vapour, so there is less cloud formation in high-pressure areas. This results in clearer skies. The opposite happens in low-pressure areas. Air flows in from the high-pressure area. The warmer air in the low-pressure area rises. The rising air cools down, so it can hold less water vapour. The water condenses to form clouds, which often bring rain.



## Strong air

1 *Make your own barometer*



Now you know what air pressure is. You are going to measure changes in air pressure. Make your own barometer.

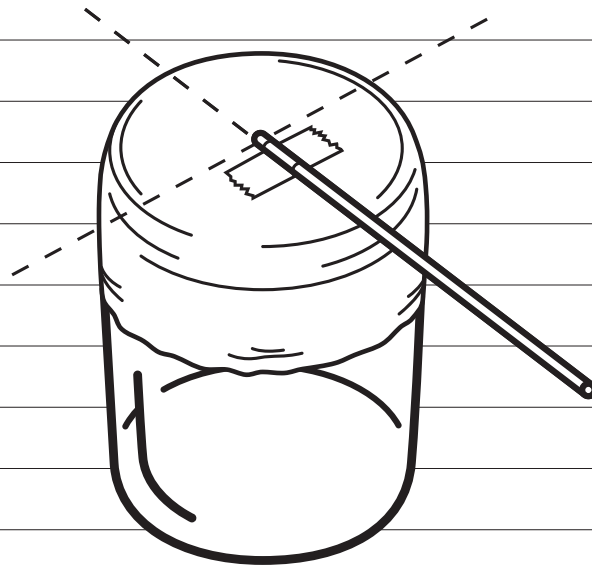
What do you need?

- plastic container or cup with a wide mouth
- balloon
- drinking straw
- scissors
- cardboard
- felt-tip pens
- glue
- sticky tape

What do you need to do?

- 1 Stretch the balloon by blowing it up and then letting the air out again.
- 2 Cut off the opening of the balloon and throw it away.
- 3 Stretch the remaining piece of the balloon over the mouth of the glass jar.
- 4 Use sticky tape to stick one end of the straw to the middle of the balloon seal. The straw should be lying flat, as shown in the drawing.
- 5 Use the felt-tip pens to draw a sun on the top of the cardboard and a cloud with rain on the bottom.
- 6 Leave the barometer in the classroom, near a wall. Make sure it is not in direct sunlight or near the radiator! Place the cardboard with the sun and cloud behind your barometer.
- 7 Draw a line on the card at the position of the straw.

Draw this line on the top side of the straw.



## 2 Measuring with your barometer

When the air pressure is high the balloon skin will be pushed into the jar.



Press the middle of the balloon skin with one finger. What happens?

From now on you should not move your barometer and card or you will not get an accurate measurement.

b Check your barometer for three days in a row, at the same time each day.

Draw a line on the card showing the position of the straw and write the date next to it. Is the straw going up or down? What kind of weather can you expect? Write your answers in the space provided.

## 3 How does your barometer work?

a What kind of weather does **high** air pressure usually bring?

day 1

day:

barometer:

weather:

day 2

day:

barometer:

weather:

day 3

day:

barometer:

weather:

A writing template consisting of a vertical line on the left and a horizontal line at the top. The top right corner of the horizontal line is rounded. Below the top line, there are seven horizontal lines, creating eight rows for writing. A small circular icon of a lit lightbulb is positioned on the left side, between the second and third horizontal lines from the top.