6-12

meteorology, geography

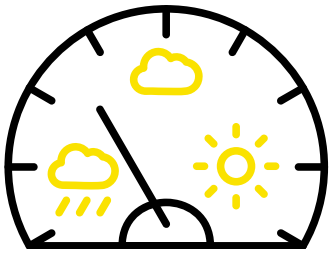
Experiment guide

Predict the weather!

What will the weather be like tomorrow?
Can you predict today whether it will rain tomorrow? With this homemade device, you can become a weather researcher and observe how air pressure changes along with the weather!

Changes in air pressure can bring sun or rain. If air sinks downwards in the atmosphere, the pressure on the earth's surface gets stronger. This causes the air to warm up and clouds to disappear - and we have sunny weather! The opposite happens when air rises: the pressure drops, the air cools down and clouds form. A device that can measure this pressure is called a "barometer".

Build your own barometer and predict the weather!



How does it work?

For this experiment, you will need a glass, a balloon and a long wooden stick or straw. The glass is covered with the balloon and the stick is attached as a pointer. If the air pressure changes, the pointer moves up or down and thereby predicts the weather.

Did you know?

Pinecones can predict the weather - they have a clever trick to protect their seeds from bad conditions. When the air is humid, the lower sides of the pinecone scales take on water from the air and expand. This makes the scales fold upwards and close. When the weather is nice and dry, the water evaporates, the lower sides of the scales contract and the pinecone opens again. This way, the cone protects its seeds from rain and only releases them when the weather is fine.

The experiment begins!

You will need:

- a sturdy glass or cup
- a balloon
- a long wooden stick or a straw
- a pair of scissors
- adhesive tape
- pen and paper
- maybe rubber bands to secure the balloon

Here we go!

Step by step:

1 Cut off the thin part of the balloon.

2 Pull the balloon over the glass so that it is completely closed. If necessary, secure the balloon with rubber bands.

3 Attach one end of the wooden stick to the center of the balloon with adhesive tape.

4 Make a small paper column from a sheet of paper, where you can note the position of the pointer every day. You can also stick a sheet of paper to the wall with some adhesive tape.

5 Set up your new barometer and the paper column in a place where they can stay for several days. Mark the height of the pointer and the current weather on the paper column.

Wait and observe...

How do the air pressure and the weather change over time?

Come back after a few hours or the next day and see if the pointer has moved. Mark its position and the weather again on the paper column.

For future meteorologists

Would you like to know even more about the weather? Think about what else you could add to your weather station. A thermometer, for example, will make your forecasts even more accurate. Note the air pressure, temperature, if the sun is shining or not, how windy it is... and write it down in a notebook or on a piece of paper every day. There's a lot to observe!

Tip: Try to gather the data from your weather station at the same time every day. This will give you the most accurate results!

Background knowledge

Your homemade barometer is made of an airtight container with a flexible lid. The air in the glass cannot escape and keeps the pressure it had when the barometer was built. Changes in the air pressure outside the jar make the balloon bulge inwards or outwards. This causes the pointer to move up or down, showing the change in air pressure.

At ISTA, the Muller group investigates long-term weather, also known as climate. Among other things, the group is interested in how rain and extreme weather conditions may change as our planet gets hotter.