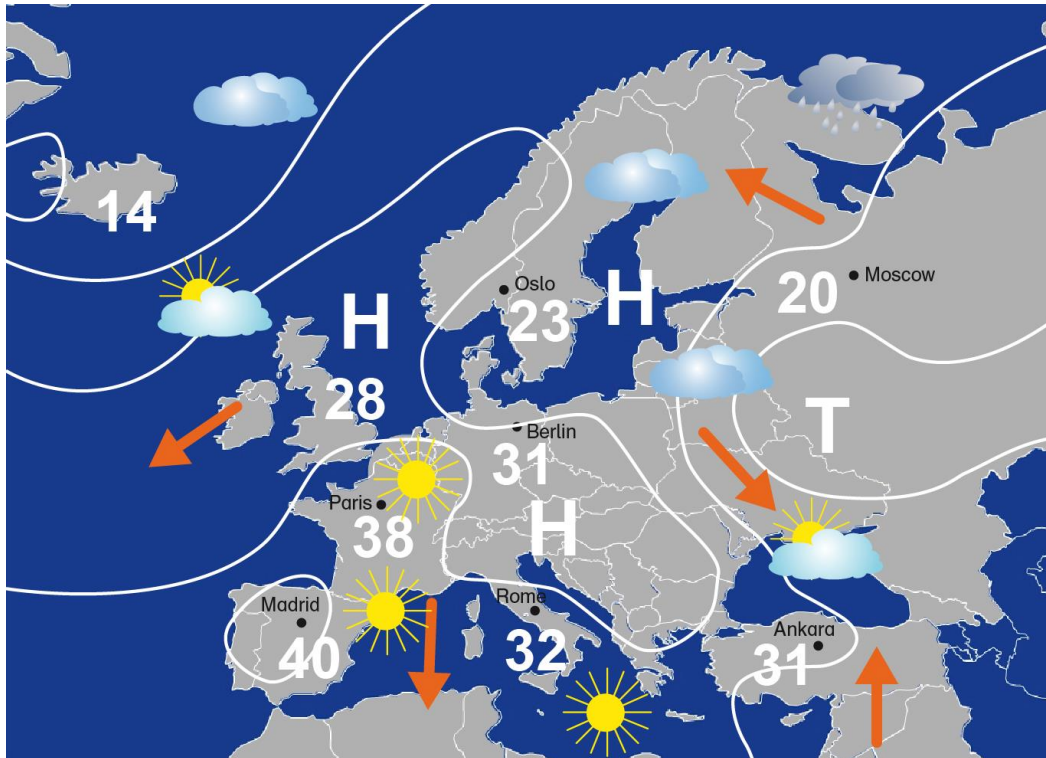


Air and weather

You surely know weather maps like this from the news:



The weather map shows us whether it's going to rain tomorrow or the sun will shine, how hot or cold it will be, and how strong the wind will blow.

Air is humid

Air always contains a certain amount of invisible **water vapor**. The warmer the air is, the more water vapor the air can hold, which means the **air humidity** is higher. But there comes a point when the air can no longer “absorb” any more water vapor and it becomes what is called “saturated.” The invisible vapor then turns into fine water droplets, a process known as condensation. We see these fine water droplets in nature as **fog** or **clouds**.



You can also observe this effect, for example, when cooking noodles. When the water heats up, hot water vapor rises. When this vapor comes into contact with cold air above the pot, we see the condensed vapor as steam.

If you then hold a cold pot lid at some distance above the pot, you will see that large drops of water form on the lid. When the hot air with the water vapor comes into contact with cold air or the cold lid, it cools and the water vapor condenses.

Cloud formation and rain in nature

This is exactly how clouds and rain form in nature. When the sun shines on damp soil or on lakes and rivers, it heats them up and water evaporates. The water vapor rises in the warm air. As it gets higher, the air becomes colder, and water droplets form from the vapor and collect together into **clouds**. If the drops are still small, the clouds are carried by the wind and no rain falls.

However, the droplets gradually combine together into bigger and bigger drops. At some point, they become so heavy that they can no longer float in the air and they fall from the sky as **precipitation**, for example, as **rain** or **snow**.



Weather and air pressure

The weather has a lot to do with **air pressure**. Air pressure is the weight of very many small air molecules “pressing” on the earth’s surface. This air pressure is quite strong, since from ground up to many thousands of meters high, there are more air molecules on top of each other than you can imagine. We don’t normally feel the air pressure since we are used to it. But we do notice when it’s not there. If you climb a very high mountain, the air pressure becomes very low. We notice this because there is less air for breathing.

When is the weather windy, sunny, or cloudy?



Air pressure is not the same everywhere in the world. The regions with high and low air pressure change all the time. The air between these regions is always in motion. We call this motion **wind**. This wind has the effect that the regions of different air pressure are always on the move.

Regions where air pressure is high are called **high-pressure areas**. The weather is usually nice there. Air pressure is high when dry air from way up high sinks toward the earth’s surface. If this dry air meets clouds and fog, these disappear. But as the air comes closer to the earth’s surface, it gets warmer and can “absorb” more water vapor. That means that with high pressure, we have few or no clouds, so it is sunny. We call this “nice weather.” (In many regions of the world, there is not enough water. People there think it is “nice” weather when it finally rains.)

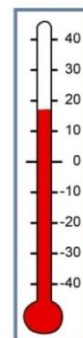




When the air pressure is low, we speak of a low-pressure area. There it is usually cloudy. On weather maps, high-pressure areas marked with an H and low-pressure areas are marked with an L.

When is it hot or cold?

The weather also affects whether it is hot or cold. When the sun shines, the earth's surface and the air heat up to a certain **temperature**. At night or in bad weather, the air cools down. We feel the air on our skin, and so we feel the weather as hot or cold.



Weather symbols

You are now a weather expert and know how clouds, rain, snow, and wind form. You also surely know these symbols from the newspaper or television. Under each picture, write what the weather could be.

Use the following terms for this:

cloudy – partly cloudy – sunny – windy – rain – snow

