Discussion

What is weather?

Weather is the state of the atmosphere in a given place at a given time. Its state is determined by weather components, that is, physical properties of the atmosphere:

- air temperature,
- atmospheric pressure,
- humidity,
- the intensity of solar radiation,
- wind,
- cloud cover,
- precipitation.

Experiment

How does wind form?

The air heated by the candle rises and cooler air flows in its place. The air movement causes the spiral to start rotating.

Wind is defined as air movement caused by the energy of solar radiation. As a result of a temperature difference, a pressure difference appears and this, in turn, creates wind.
For example, the air above the land heats up faster than that above water. Warm air rises. It is replaced by cooler and heavier air coming from above water. We can feel it, for example, as a wind blowing from the sea. At night, the process is reversed. The surface of the land cools down faster than heated water; therefore, warm air above the water rises and cooler air masses from above the land move towards the water.
As the air rises, the air pressure decreases slightly, and as the air falls, the pressure exerted on the surface increases. Therefore, the air flows from a place with a higher pressure to a place with a lower pressure. Such a horizontal air flow resulting from the pressure difference is called wind.

Discussion

How do clouds form?

Water vapor rises from the surface of our planet, and then escapes into the atmosphere. When the air cools down at a high altitude, water vapor condenses. Water vapor creates clouds, from which water falls to the surface of the Earth in the form of rain, snow or hail.
Clouds have a major impact on air temperature. During the day, they limit the access of sunlight to the surface of the Earth; therefore, they limit its heating, and at night they retain the heat. That is why in tropical countries, for example, it is cooler during the rainy season than during the dry season. In countries with moderate climate, on the other hand, cloudy nights in a given season are warmer than cloudless nights.

Experiment

How do clouds form?

When a bottle with a balloon on top is put in hot water, the balloon inflates because the warmed air from the bottle has risen.
When the bottle is transferred to the container with cold water, the balloon starts to fall (deflate).
Warm air weighs less than cold air – cold air pushes warm air upward.
Water vapor, which forms part of heated air, has also risen along with it.

Experiment

How does a cloud form?

One of the components that the air consists of is water vapor, that is, very small water droplets. A cloud is formed as a result of water vapor droplets merging into tiny drops of water or ice crystals. This process is called condensation. In order for the tiny droplets of water vapor to join into larger drops, the so-called condensation nuclei are needed, to which the molecules of water vapor can “stick”. There are plenty of them in the air. In our experiment, the smoke from a match acts as the condensation nuclei.