

## METEOROLOGY JUNIOR

Meteorology is the science that studies atmospheric phenomena such as clouds, winds, precipitation and the processes that produce them. It must not be confused with climatology, which studies the atmospheric phenomena of the entire planet over a period of time and the variations that have taken place. The most evident purpose of meteorology is the weather forecast, but meteorology is a very complex science. Together with climatology, in fact, it tries to comprehend the atmosphere's mechanisms and to understand how climate changes as a result of natural and anthropic causes. To be able to predict the weather has always been a requirement of man in order to manage and programme all his activities, from entertainment to sport, from agricultural activities to open air industrial ones.

All meteorological phenomena originate in the atmosphere, in particular in its lower layers (troposphere) which are in direct contact with the Earth's surface. Both the climate and the weather are determined by the interactions between the Sun and Earth. Both influence the temperature, the water and the wind. The heat of the Sun warms the air and is distributed throughout the entire atmosphere. The temperature of the atmosphere influences an important parameter: atmospheric pressure. The latter is equal to the weight of a column of air as high as the Earth's atmosphere. Each one of us is subjected to this weight without realising it. Atmospheric pressure is not the same all over the world, but is influenced by various factors such as altitude, air temperature and humidity. Generally, an increase in pressure indicates an improvement in weather conditions; on the contrary, a decrease implies worsening weather. One must be careful, however, because this rule does not always hold true! In fact, it could happen that a drop in pressure is followed by a rapid improvement of the weather conditions. This occurs in the Padana Plain when the Foehn wind blows (a wind that is characteristic of the Alpine arc).

Precipitation includes all forms of water, in a liquid or solid state, that fall or are formed on the Earth's surface. It can be divided in direct precipitation, like rain, snow and hail and occult precipitation like dew and frost that do not fall from clouds but form directly on touching the Earth's surface. Precipitation occurs when there are specific conditions and it depends on the amount of water vapour present in the atmosphere. Since it is lighter than air, the water vapour present in air tends to rise until it reaches its dew point. Beyond this threshold, water vapour condenses (changes to the liquid state) forming clouds that will produce rain, or, at temperatures below zero, forming ice crystals that will fall as snow flakes.