

Weather patterns

Look outside—what is the weather like today? Is it dry or wet, sunny or cloudy, cold or hot? Weather is the state of the atmosphere (the air) all around you at a particular time. Every day, weather affects how you live—what you wear, where you go, what you do. People also rely on the right mixture of weather—sun and rain—to grow crops for food to eat.

In a day

The weather is the result of a complex mixture of atmospheric conditions. In some places the weather is quite predictable. In others it can change dramatically in a few hours, or even faster.



Sun and rain produce a rainbow

Key facts

- In temperate regions (between the tropics and the polar regions) the weather is changeable, with sun and rain in quick succession.
- In tropical regions, daily weather often has a similar pattern, with sunny mornings followed by a brief period of rainfall in the afternoon, and a clear dusk.
- Normal weather in one place may be considered extreme in another. For example, Canada's freezing winters would be considered extreme in Florida.

Weather systems

Although the weather is very complex, there are patterns of weather across the world. These patterns can be seen clearly from space as layers of cloud. Some weather systems bring rain, while others bring long periods of fine, settled weather. Some, like the monsoon, are seasonal.

Key facts

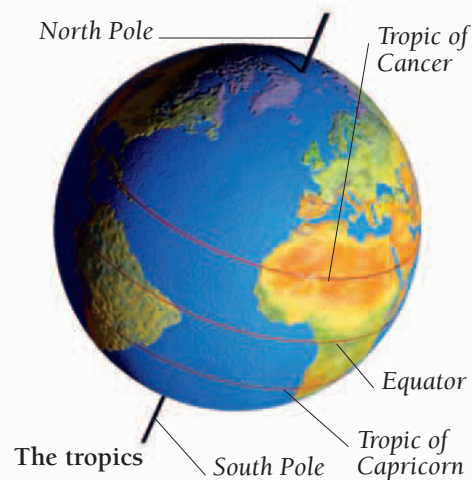
- Monsoon winds are strong winds that blow in opposite directions depending on the season.
- Bands of fast-moving air, called jet streams, move high through the Earth's atmosphere. The four major jet streams have a huge influence on the world's weather systems below them.



Bands of cloud above Earth

Hottest and coldest

Weather happens in the atmosphere because the Sun heats the Earth unevenly. The tropical regions near the equator receive more heat energy from the Sun than the regions near the poles. The difference in temperature between the two regions drives the large movements of air that we call wind.



Key facts

- The tropics are the regions that lie between the equator and the Tropic of Cancer in the northern hemisphere, and the equator and the Tropic of Capricorn in the southern hemisphere.
- The tropical regions include all the surface area on Earth in which the Sun is directly overhead (at 90°) at least once a year.
- The South Pole is colder than the North Pole because the South Pole lies in the middle of the vast Antarctic landmass, while the North Pole is surrounded by the frozen Arctic Ocean.
- Antarctica is covered by a huge sheet of ice that extends over an area of almost 5.4 million square miles (14 million square kilometers).