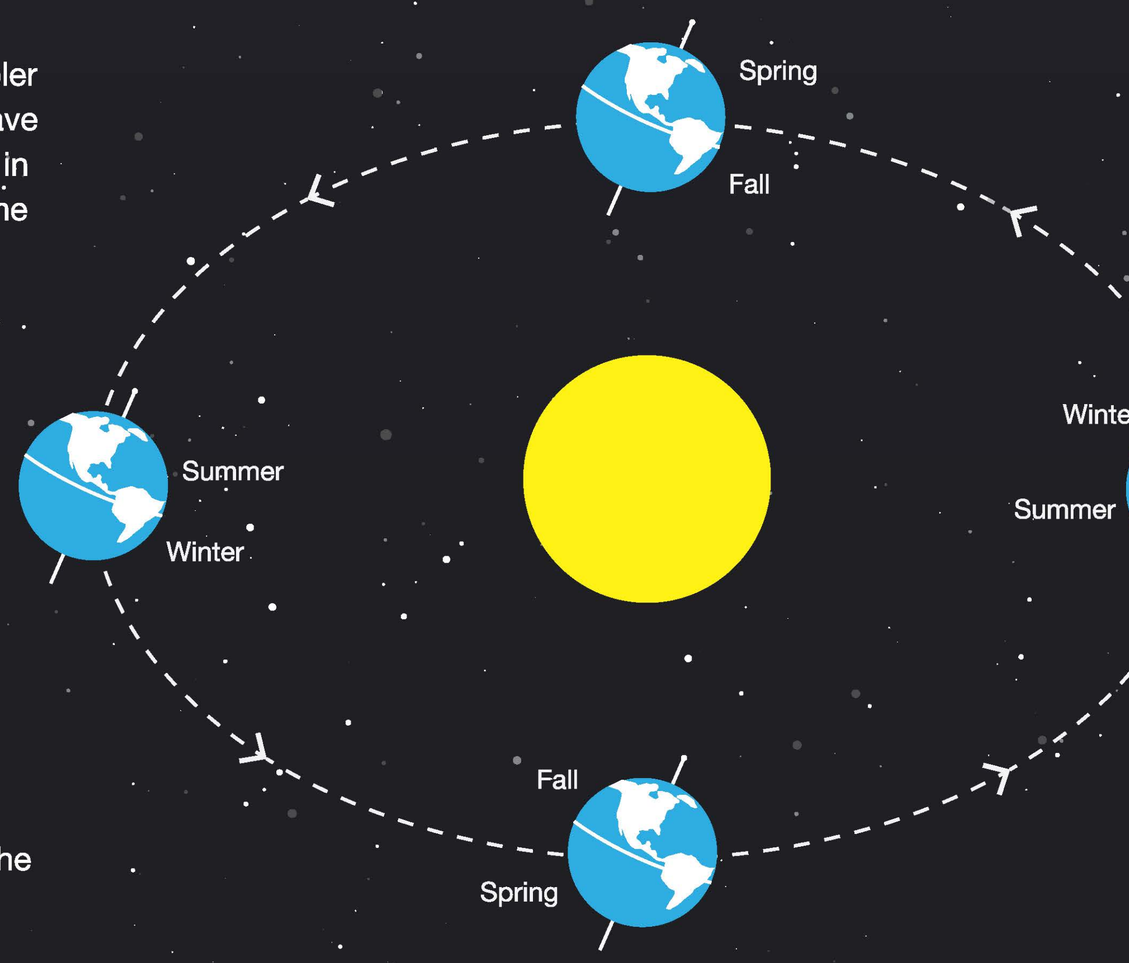
What's the difference between **weather** & **climate**?

The short answer:

Time. **Weather** refers to the short-term conditions of the atmosphere, or the layer of air that surrounds us, at any given moment. **Climate** refers to the long-term patterns of weather that occur in a specific place over many years, decades and centuries.

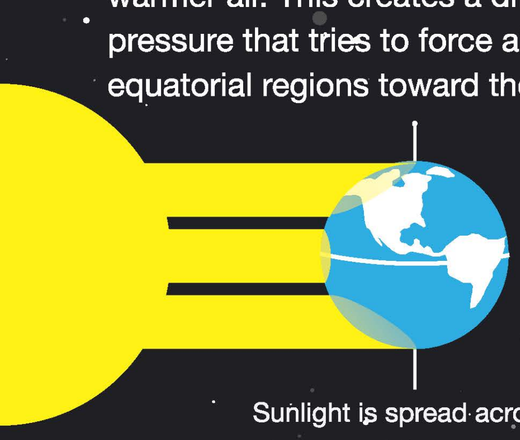
Both weather and climate stem from the rotation of Earth and the unequal heating it receives from the Sun.



1

Earth experiences unequal heating from the Sun

Earth is spherical, so it gets unequal amounts of direct sunlight. Typically, areas that get less sunlight have cooler air, while areas with more sunlight have warmer air. This creates a difference in pressure that tries to force air from the equatorial regions toward the poles.

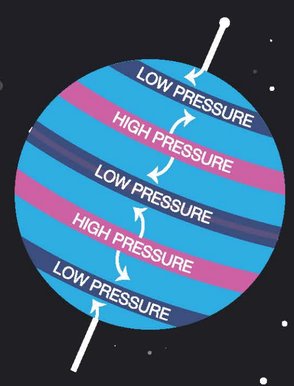


Sunlight is spread across a greater area at the poles and hits more directly near the equator.

2

Earth's rotation on its axis creates the Coriolis Effect

This air doesn't travel in a straight line because Earth rotates on its axis, creating the Coriolis Effect. The moving air gets deflected to the right in the northern hemisphere and to the left in the southern hemisphere, resulting in west-to-east jet streams.



- Air is deflected with respect to the direction of travel

3

Earth's tilt creates seasons

Earth is tilted on its axis, so as it travels in its orbit, different parts of the planet tilt towards or away from the Sun, getting more or less sunlight. These variations create seasons and lead to seasonal changes in weather and climate.

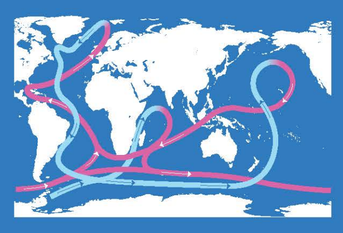
But wait! There's more ...

Earth's rotation and unequal heating are just the foundation for weather and climate. These dynamic systems can also change based on the type of vegetation in an area, the greenhouse effect, human activity and more.

These factors drive weather and climate by creating:

Atmospheric circulation

The interactions between Earth's rising and sinking air combined with the Coriolis Effect create global wind patterns.



Ocean circulation

Temperature variations caused by winds and the unequal heating of Earth create ocean currents and affect the water cycle.

Weather

Weather can change at any time, but places do experience typical seasonal and regional patterns. Weather is made up of:

- **Temperature** How hot or cold the air is
- **Atmospheric pressure** The force exerted by the weight of the air
- **Precipitation** Liquid or solid water that falls from the air
- **Wind** The movement of air
- **Humidity** The amount of water vapor in the air

TIMELINE

MINUTES

HOURS

DAYS

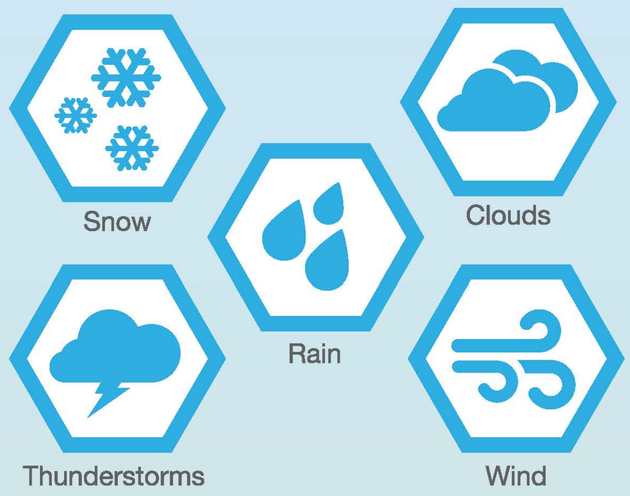
MONTHS

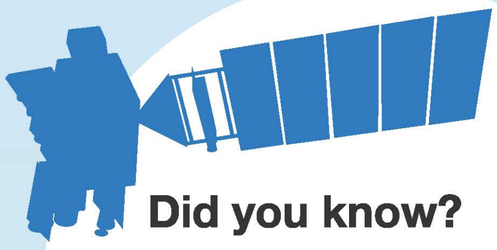
YEARS

DECADES

CENTURIES

Types of weather:





Did you know?

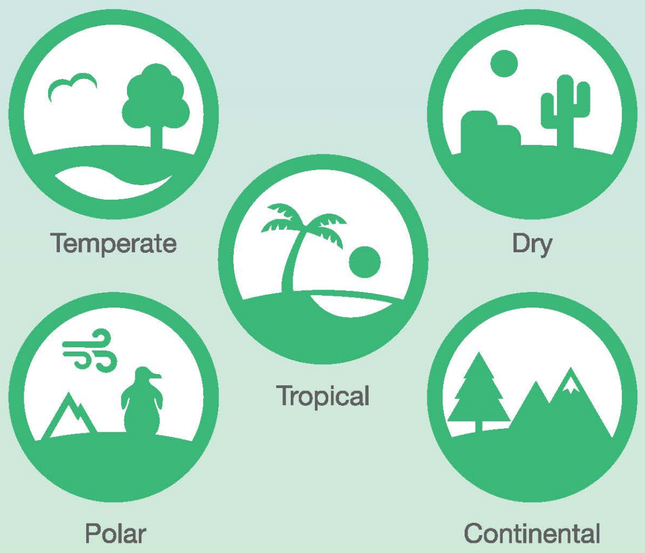
Satellites in NOAA's Geostationary Operational Environmental Satellites-R Series (GOES-R) keep a close eye on weather and climate from 22,000 miles above Earth.

Climate

Climate can be seasonal, regional or global. Regional climate is influenced by:

- **Latitude** The amount of sunlight a place receives varies by latitude
- **Altitude** The higher the altitude of a place, the colder it is
- **Geography & topography** Mountains, oceans and other land features affect temperature, wind flow and more
- **Prevailing winds** Recurring cycles of winds create long-term climate patterns

Types of climate:



Did you know?

Global climate is an average of all the regional climates across Earth and describes the climate of the entire planet.