



# How the Sun, Oceans, and Air Create Earth's Weather

KS3

Ages 11-14 ⌚ 3 min read

## The Sun Powers Everything

The **Sun** is the engine that drives all weather on **Earth**. It heats our planet unevenly—places near the **equator** get more direct sunlight and become hotter, while areas near the **North Pole** and **South Pole** get weaker sunlight and stay frozen. This temperature difference is the starting point for all weather patterns.

## How Air Moves Around

Hot air rises and cold air sinks. This creates invisible rivers of moving air called **convection currents**. When hot air near the equator rises, it spreads out towards the poles. When it cools down, it sinks back down. This constant circulation pushes air and weather systems all around the planet. **Wind patterns** like the **trade winds** and **jet streams** follow these paths and steer storms and rain clouds across continents.

Think of it like a pot of boiling water: hot water rises in the middle, travels to the edges, cools down, and sinks back to the bottom to heat up again. Earth's air does exactly the same thing.

## Water's Huge Role

The **oceans** act like giant batteries that store heat from the Sun. Warm ocean currents, like the **Gulf Stream**, carry heat across the globe and change the weather of nearby lands. When ocean water evaporates and becomes invisible water vapour, it rises into the sky. When it cools high above Earth, it condenses into clouds and falls as rain or snow. This endless cycle is called the **water cycle**, and it creates most weather systems we experience.

## Land Gets in the Way

Mountains, deserts, and forests change how weather moves. Tall **mountains** force air upwards, which cools it down and causes rain on one side while leaving the other side dry. **Deserts** heat up intensely and create different air patterns than **rainforests**,

which stay humid and produce their own weather systems. Ocean currents also affect nearby land—coastal areas often have milder winters and cooler summers than places far inland.

Think of it like a game of pinball: mountains, oceans, and deserts are the bumpers that change where the air currents go.

## **Earth's Spinning Matters Too**

As **Earth** rotates, it makes moving air curve sideways. This is called the **Coriolis effect**. Without it, storms would blow straight from hot to cold zones. Instead, they spin and twist into hurricanes and cyclones. This is why storms rotate in different directions in the **Northern Hemisphere** and **Southern Hemisphere**.

Together, the Sun's uneven heating, air circulation, oceans, mountains, and Earth's rotation create the amazing variety of weather patterns we see around the world—from tropical rainforests to frozen tundras.