



# Wind

## What Is Wind?

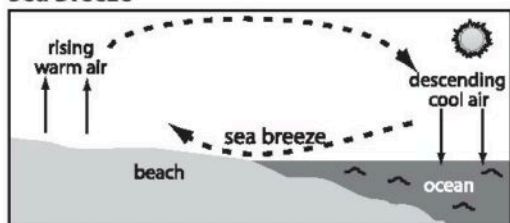
**Wind** is simply air in motion. It is caused by the uneven heating of the Earth's surface by radiant energy from the sun. Since the Earth's surface is made of very different types of land and water, it absorbs the sun's energy at different rates. Water usually does not heat or cool as quickly as land because of its physical properties.

An ideal situation for the formation of local wind is an area where land and water meet. During the day, the air above the land heats up more quickly than the air above water. The warm air over the land expands, becomes less dense and rises.

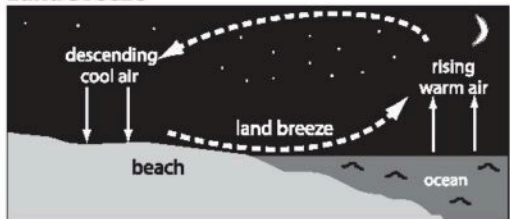
The heavier, denser, cool air over the water flows in to take its place, creating wind. In the same way, the atmospheric winds that circle the Earth are created because the land near the Equator is heated more by the sun than land near the North and South Poles.

Today, people use wind energy to make electricity. Wind is called a **renewable** energy source because the wind will blow as long as the sun shines. Wind only accounts for a small amount of U.S. energy consumption—a little more than two percent—but it is one of the fastest growing renewable sources of energy, and accounts for almost six percent of U.S. electricity.

### Sea Breeze



### Land Breeze



## Wind Direction

A weather vane, or wind vane, is used to show the direction of the wind. A wind vane points toward the source of the wind. Wind direction is reported as the direction from which the wind blows, not the direction toward which the wind moves. A north wind blows from the north toward the south.

## Wind Speed

It is important in many cases to know how fast the wind is blowing. Wind speed can be measured using a wind gauge or **anemometer**.

One type of anemometer is a device with three arms that spin on top of a shaft. Each arm has a cup on its end. The cups catch the wind and spin the shaft. The harder the wind blows, the faster the shaft spins. A device inside counts the number of rotations per minute and converts that figure into miles per hour. A display on the anemometer shows the speed of the wind.

## History of Wind Machines

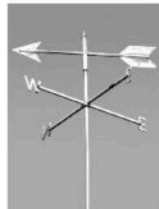
Since ancient times, people have harnessed the wind's energy. Over 5,000 years ago, the ancient Egyptians used the wind to sail ships on the Nile River. Later, people built windmills to grind wheat and other grains. The early windmills looked like paddle wheels. Centuries later, the people in Holland improved the windmill. They gave it propeller-type blades, still made with sails. Holland is famous for its windmills.

In this country, the colonists used windmills to grind wheat and corn, to pump water, and to cut wood at sawmills. Today, people occasionally use windmills to grind grain and pump water, but they also use modern wind turbines to make electricity.

### Windmill



### Weather Vane



### Anemometer

