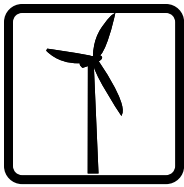


# Wind Energy



Wind is moving air.  
There will be wind as long  
as the sun shines.



# Wind Energy

## TEACHER

Wind is moving air. We can use the energy in wind to do work. Early Egyptians used the wind to sail ships on the Nile River. People still use wind to move them in sailboats. In the Netherlands, people used windmills to grind wheat. American colonists used windmills to grind corn, pump water, and run sawmills. Today, we use wind to make electricity.

The energy in wind comes from the sun. When the sun shines, it heats the Earth. Some parts of the Earth get hotter than others. An area where land and water meets is a good example. Land usually absorbs and releases energy more quickly than water. The air over the land gets hotter than the air over the water. The warm air rises, and cooler air rushes in to take its place. The moving air is wind.

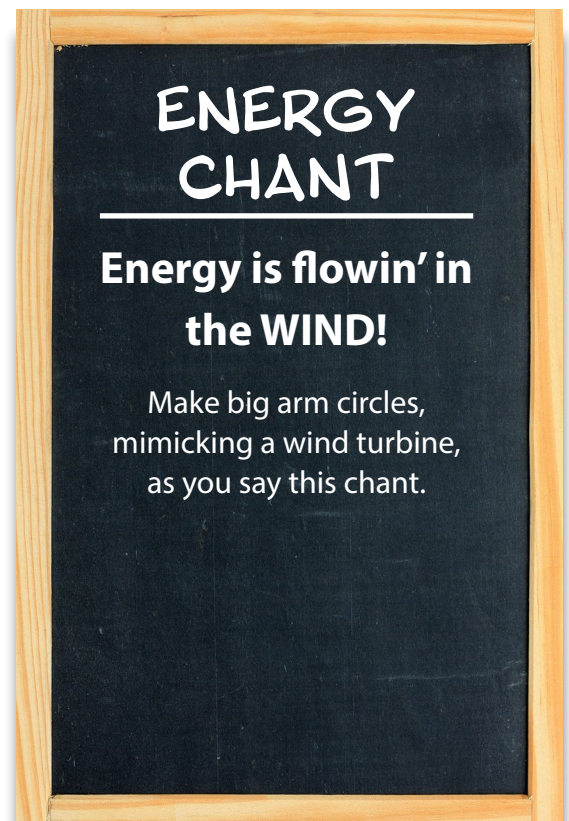
As long as the sun shines, there will be winds on the Earth. We will never run out of wind energy. It is a renewable energy source. It is also free, since no one can own the sun or the air.

Some places have more wind than others. Areas near the water usually have a lot of wind. Flat land and mountain passes are good places for the wind, too. Today, we use big **wind turbines** to catch the wind. Sometimes, there are hundreds of wind turbines in one place. This is called a **wind farm**. Not all wind farms are on land; some wind farms are on the water. These are called **offshore wind farms**. The first offshore wind farm in the United States was built off the coast of Block Island, Rhode Island. The five-turbine wind farm began generating electricity in 2016. Two new turbines were built in 2020 off the coast of Virginia, which are the start of a large wind farm being built in the same area. More wind farms are currently being built in the Atlantic Ocean.

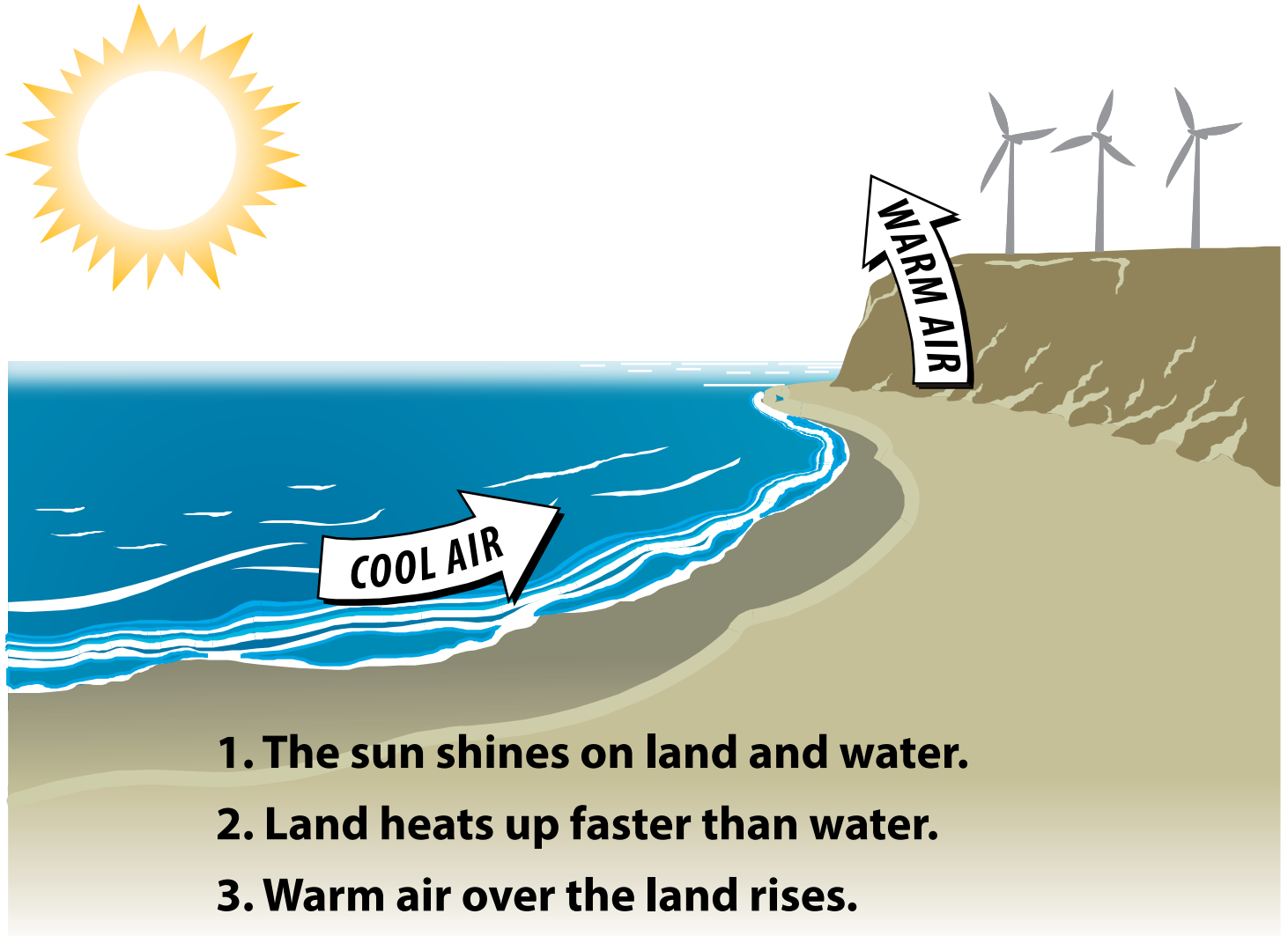
Many of the wind turbines on wind farms are very tall so they can catch the most wind. Modern wind turbines can be taller than a football field. Not all wind turbines are that big, though. Some wind turbines might be only 30 feet tall. People can put small turbines up in their backyards to generate electricity to use at home. Schools can put small wind turbines on their property to make electricity, too. Small wind turbines can even be put on sailboats so people have electricity when they are sailing on the water.

When the wind blows, it pushes against the blades of the wind turbines. The blades spin around. They turn a **generator** to make electricity. The wind turbines do not run all the time, though. Sometimes the wind does not blow at all. Sometimes the wind blows too hard. Most wind turbines operate 65 to 90 percent of the time.

Today, wind energy makes 10 percent of the electricity we use. Most of the big wind farms are in Texas, Iowa, Oklahoma, Kansas, and Illinois. More wind turbines and wind farms are popping up all over the country.

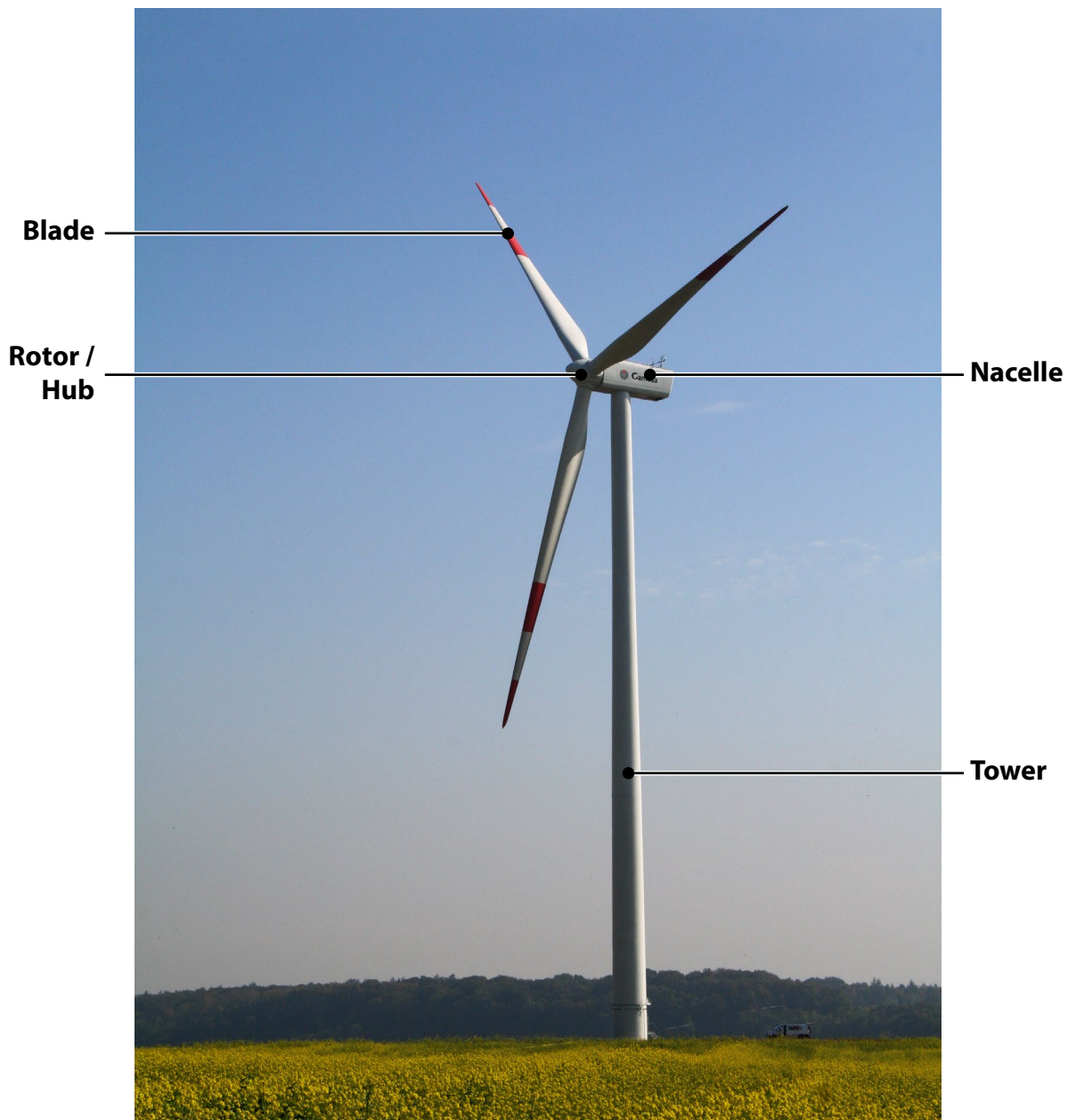


# How Wind Is Formed Where Water Meets Land



1. The sun shines on land and water.
2. Land heats up faster than water.
3. Warm air over the land rises.
4. Cool air over the water moves in.

# Wind Turbine



Wind turns the turbine blades, which spin magnets and wires inside the nacelle to generate electricity.

A wind turbine turns wind energy into electricity.