Hydropower



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Moving water has energy.

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Hydropower
TEACHER

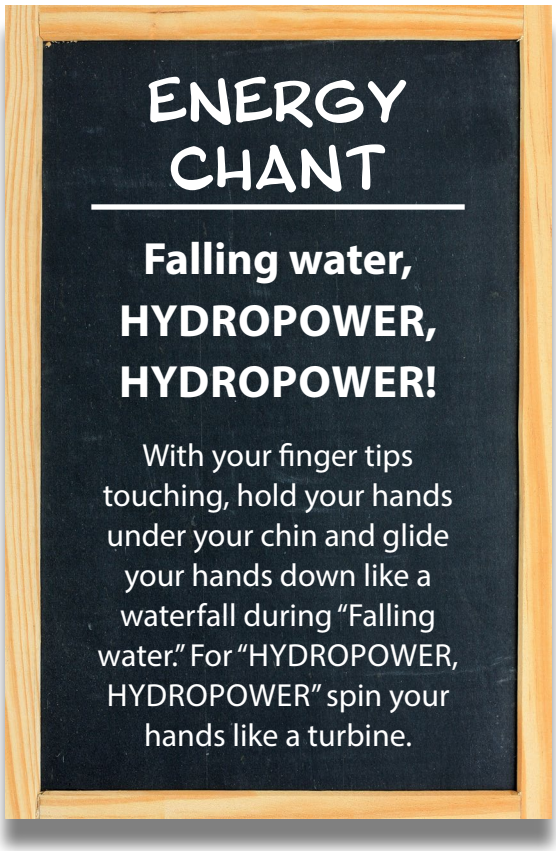
Hydro means water. **Hydropower** is the energy we make with moving water. Moving water has a lot of energy. We use that energy to make electricity.

Gravity, the force of attraction between all objects, makes the water move. Gravity pulls the water from the clouds to the ground and from high ground to low ground. The rain that falls in the mountains flows down the valleys to the oceans.

The sun heats the water in the oceans, turning it into **water vapor**, a gas. This is called **evaporation**. The water vapor rises. It turns into clouds when it reaches the cold air above the Earth. The clouds release the water as **precipitation**—rain or snow—and the cycle starts again. This is called the **water cycle**.

The water cycle will keep going forever and water on Earth will always be there. We will not run out of it. That is why we call hydropower a **renewable** energy source.

Water wheels can use the energy in moving water. A water wheel has buckets around a big wheel. The buckets fill with water at the top of the wheel. The weight of the water (gravity) turns the wheel and dumps the water at the bottom.



Early settlers used water wheels to grind grain and run sawmills. Factories used water wheels to run their machines and water wheels moved boats. In many countries, water wheels are still used.

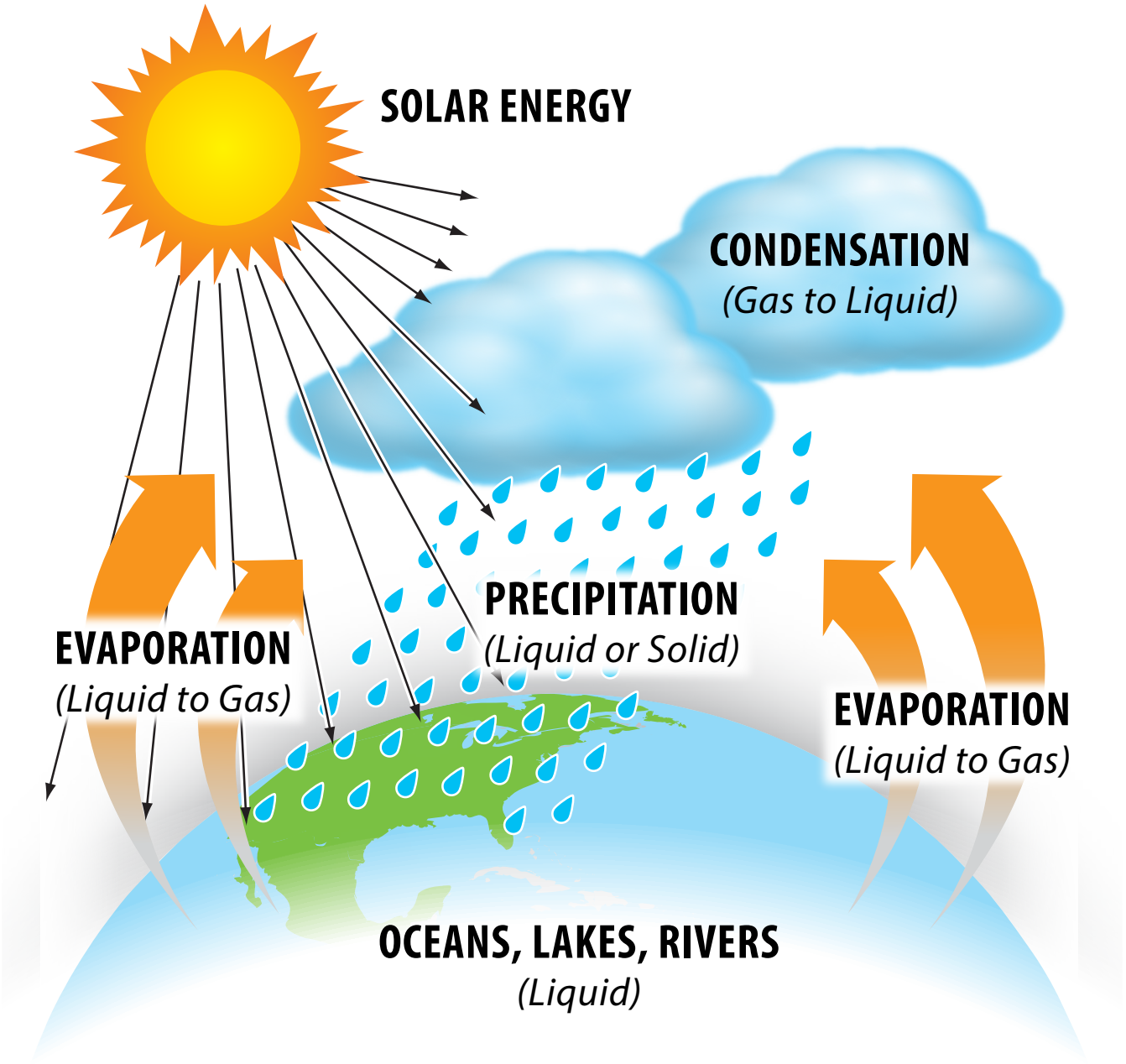
Moving water can be used to make electricity. The U.S. gets five percent of its electricity from hydropower. Most of the time, a dam is built across a river. This stops the water and makes a big lake behind the dam. This lake is called a **reservoir**.

When the gates of the dam are opened, the water rushes from the reservoir into the dam. Gravity pulls it. The water flows down big tubes called **penstocks** and turns giant wheels, called **turbines**. The spinning turbines are attached to **generators** that make electricity. The first hydropower plant was built on the Fox River in Appleton, Wisconsin, in 1882. Today, there are more than 2,200 dams in the United States that make electricity.

Hydropower is a clean source of energy. No fuel is burned, so the air is not polluted. It is the cheapest source of electricity, because the water is free to use. And we won't run out of water—it is renewable.

The reservoirs behind dams can be used for swimming, fishing, boating, and other sports. When dams are built, however, the reservoirs flood a lot of land. They change the flow of the rivers. Sometimes, fish in the rivers cannot swim and lay their eggs like they could before. Dams have to provide a way for fish to get across the dam to lay eggs.

The Water Cycle



Hydropower is renewable.

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Image courtesy of NEED Staff

The Glen Canyon Dam in Arizona.

A hydropower plant makes electricity.