

Name \_\_\_\_\_

## Great Lakes

The Great Lakes are located on the border between Canada and the United States. Of the five lakes, only Lake Michigan is completely within the United States. The other four lakes help form the border between the United States and Canada.

The Great Lakes were formed during the last ice age, about 10,000 years ago. Huge sheets of ice, called *glaciers*, covered Canada and the northern United States. When the glaciers receded, they left ridges and large basins. Some of the water from the melting glaciers filled in these basins, creating the lakes.

The Great Lakes and the channels that connect them form the largest fresh-water system on Earth. They hold about one-fifth of the world's supply of fresh water. If the water from the Great Lakes was spread evenly over the United States (not including Alaska and Hawaii), the entire country would be covered in nearly 10 feet of water!

Lake Superior is the largest and deepest of the Great Lakes. It is also the coldest lake. Lake Ontario is the smallest lake, but it actually contains four times as much water as Lake Erie, which is about 2,600 square miles larger than Lake Ontario. That is because Lake Erie is very shallow. Since it is so shallow, Lake Erie warms up quickly in summer. It is more likely to freeze in winter than the other Great Lakes.

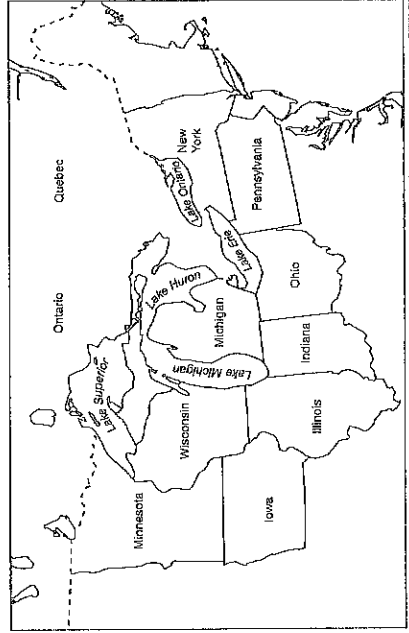
### The Five Great Lakes

Great Lake	Size	Average Depth	Maximum Depth
Erie	9,900 sq. miles (25,700 sq. km)	62 feet (19 m)	210 feet (64 m)
Huron	23,000 sq. miles (59,600 sq. km)	195 feet (59 m)	750 feet (229 m)
Michigan	22,300 sq. miles (57,800 sq. km)	279 feet (85 m)	925 feet (282 m)
Ontario	7,300 sq. miles (19,000 sq. km)	283 feet (86 m)	802 feet (244 m)
Superior	31,700 sq. miles (82,100 sq. km)	483 feet (147 m)	1,332 feet (406 m)

A. Write a caption for the map on the other page to compare at least two of the lakes. Use the information on this page to help you.

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## Great Lakes



B. Circle the lake that matches each clue. Use the information on the other page and the map above to help you.

- the largest lake Lake Superior
- the shallowest lake Lake Erie
- the smallest lake Lake Erie
- the second-largest lake Lake Michigan
- the only lake completely in the U.S. Lake Michigan
- the coldest lake Lake Ontario
- the lake with an average depth of 283 feet Lake Erie
- the lake that has an area of 22,300 square miles Lake Superior

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## Hydroelectricity

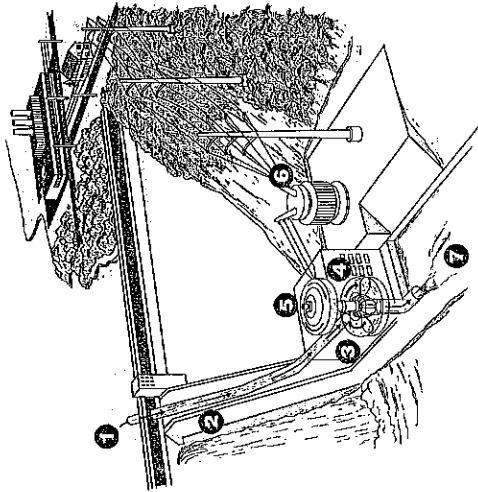
The rivers of North America provide an important resource. Water from rivers can be used to generate electricity. This form of energy is called *hydroelectricity*. Hydroelectricity is a renewable resource and is relatively inexpensive to produce. Also, unlike burning fossil fuels, hydroelectricity does not cause pollution.

In order to use water to make electricity, people must construct a dam on a river. A single river may have hundreds of dams along its length. Unfortunately, that can have some negative effects on the environment. Damming a river makes it impossible for migrating fish such as salmon to swim up the river to lay their eggs. It also makes the water warmer, which is not good for plants and animals that are adapted to colder temperatures. In addition, dams cause a buildup of mud and silt, which can clog a river.

About 15% of the world's electricity comes from hydroelectricity. Rivers in the Canadian Shield provide a great deal of hydroelectricity in Quebec and Ontario. The United States has over 2,000 hydroelectric plants. Of these, the Grand Coulee Dam on the Columbia River in Washington produces the most electricity.

Hydroelectricity uses the power of flowing water to create electricity. Here's how it works:

1. Water from behind the dam falls through the floodgates.
2. The water gathers speed as it flows down through a tunnel called a *penstock*.
3. The water hits the blades of a machine called a *turbine*, causing the turbine to spin quickly.
4. The turbine is attached to a shaft. As the turbine spins, so does the shaft.
5. The shaft spins magnets in the generator. This makes electricity in the wire coils that surround the magnets.
6. The electricity is carried away to homes and buildings by the transmission wires.
7. The water flows out of the dam and down the river.



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## Hydroelectricity

- A. Number the steps for making hydroelectricity in order from 1 to 7. Use the diagram on the other page to help you.

- \_\_\_\_\_ The water hits the blades of the turbine, making the turbine spin.
- \_\_\_\_\_ The water flows out of the dam and down the river.
- \_\_\_\_\_ Electricity is carried away by the transmission wires.
- \_\_\_\_\_ The shaft spins magnets in the generator to make electricity.
- \_\_\_\_\_ Water comes through the floodgates.
- \_\_\_\_\_ The shaft spins.
- \_\_\_\_\_ The water flows down through the penstock.

- B. What are three environmental problems that are caused by dams?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

- C. What are three advantages of using hydroelectricity?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_