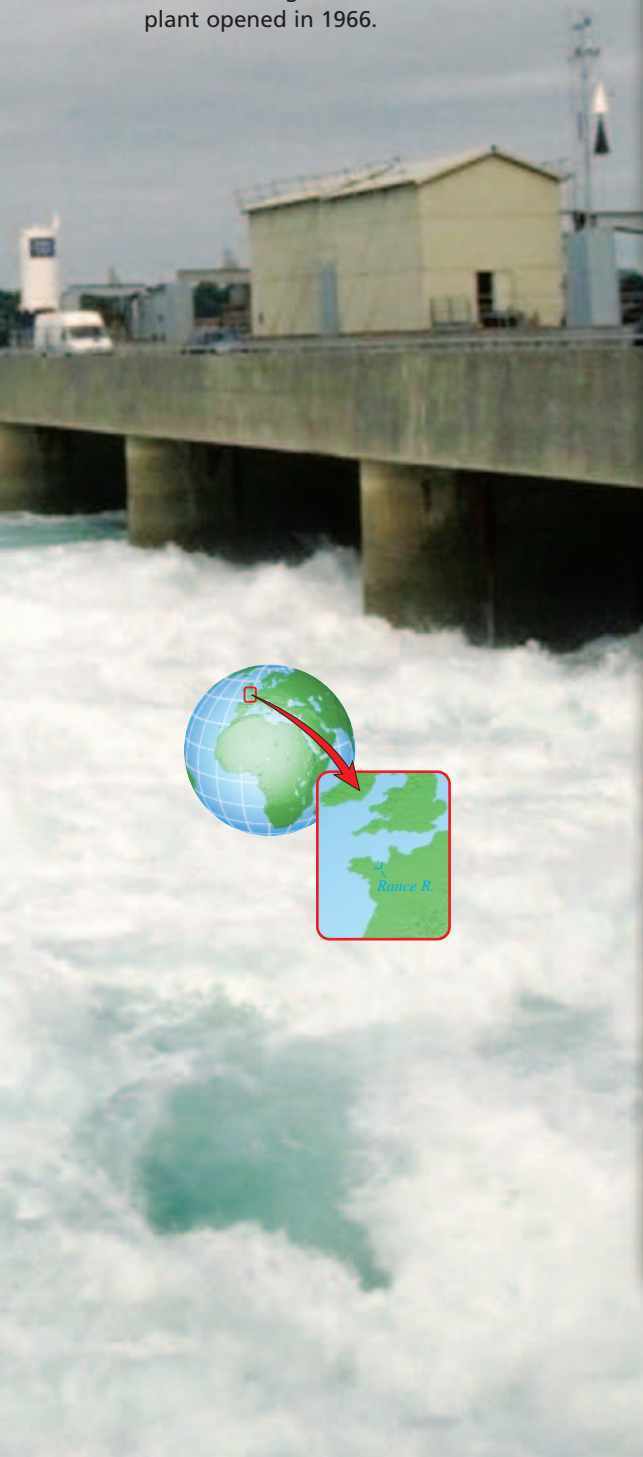


The first and largest tidal energy plant in the world is in northern France, where the Rance River enters the English Channel. The plant opened in 1966.



## Tidal Energy

Tidal power plants can work only in a few locations in the world. The best locations for tidal energy plants are ones with large differences between high and low tides. Why can't tides make electricity just anywhere?

### Under Pressure

Each of these jugs contains the same amount of water. Water sprays out of the hole at the bottom of each—but why does it spray farther out of the narrow jug? The water pressure is greater in the tall, narrow jug because the water is deeper. The width of the jug does not matter—just the depth. The deeper the water, the greater the water pressure. The higher the water pressure, the faster the water comes out of the hole—and the farther the water sprays.

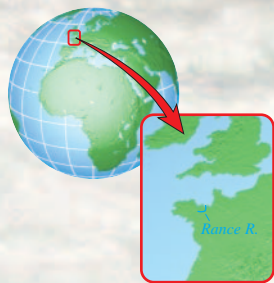


### From Pressure to Power

Tidal dams use moving water to turn turbines that power generators. Turning turbines requires work. Work is the use of force to move an object. In this case, the force of the water is doing work on the turbines. The faster the water moves, the more work it can do.

### Location, Location, Location

Think again about the two jugs. The water moves faster out of the hole in the tall, narrow jug—the one with the higher water pressure. Tidal power plants work best in places where high water pressure moves the water fast enough to turn the turbines. Remember that deeper water makes for higher water pressure. So tidal power plants work best in places with a large tidal range—the difference between high and low tide.



### EXPLORE

- 1. APPLY** When the water trapped behind a dam is released, it is channeled through openings in the dam and spins the turbines. From what you've learned about water pressure, where do you think the openings are, toward the top of the dam or toward the bottom? Explain your reasoning.
- 2. CHALLENGE** Make a model of a tidal-energy plant. Use the side of a milk jug as a base, modeling clay to make the basin, and pieces of plastic for the dam and gates. Try different shapes for your basin and different sizes of gates to see how fast you can get the water to flow.