

INTEGRATING ENVIRONMENTAL SCIENCE**● Thermal Pollution**

Many large factories release energy as heat from the industrial processes they conduct. Factory managers commonly use large amounts of water to transfer heat from factory equipment. The water gains this energy by conduction—by direct contact with the hot equipment—and the hot equipment loses the energy. Often, the warm water is released into a nearby body of water. Once in the body of water, the warm water mixes with the natural water. The natural temperature of the body of water will rise for some distance around the site where the warm water enters.

How Hot Water Affects Wildlife

Hot water released into a river, stream, or other body of water is a form of thermal pollution because the natural temperature is changed. Cutting down trees that shade a river or a stream also can raise the water temperature. Thermal pollution kills some animals and plants that are used to living at cooler temperatures. Raising the temperature of the water reduces the amount of oxygen that the water can hold, which affects the life cycles of some plants, fish, and other organisms. Also, parasites and diseases may become more prevalent at higher temperatures.

Guidelines for testing for thermal pollution vary from state to state. One way you can test for thermal pollution in water is to measure the difference in the water temperature between the entry site and a point 1 mi upstream. A change of 0°C to 2°C is evaluated as *excellent*. A change of 2.2°C to 5°C is evaluated as *good*. A change of 5.1°C to 9.9°C is *fair*, and more than 10°C difference is considered *poor*.

Your Turn to Think

Use the space below to design a table to record the data from testing for thermal pollution in a river. Your table should include places to record the date of each test, descriptions of the sampling sites, the temperatures, the evaluation score, and other items that might be helpful.