

Test a Sample of Industrial Waste

At the beginning of Chapter 1, you read about an environmental scientist testing the water in a river for contaminants—pure substances and mixtures that should not be there. Scientists use these tests to help stop pollution and to protect plants and animals living in natural ecosystems (Figure 1).



Figure 1 This environmental scientist is taking a sample of water to test for pollutants.

Scenario

You will play the role of an environmental scientist. You have been called in to investigate a river that may be polluted. There is a natural woodland on one side of the river and a factory on the other side of the river. Some of the waste from the factory runs into the river.

Design Brief

Your task is to separate and identify the components of a sample of contaminated river water taken from just below the factory's waste pipe. Your procedure should be efficient (have the fewest possible steps) and effective (separate as many components as possible).

You will determine whether the factory waste contains pollutants that might be harmful to local wildlife. You will also suggest how the factory could remove these pollutants from its water before letting the water run into the river. Finally, you will consider the costs and benefits of your suggestion.

Equipment and Materials

Several identical samples of contaminated river water are available for you to work with. Choose the equipment and materials for your procedure, including safety equipment.

Research and Consider

Examine the mixture and think about the characteristics of the components of the mixture. If necessary, place the mixture under bright light or stir it to explore its components further. You may want to use a magnifying glass.

Plan and Construct

1. Plan how you will separate a sample of the mixture into its components. Assume that the mixture may have components that you cannot see. You may choose to use the technique shown in Figure 2.



Figure 2 One technique for removing water from a mixture