

Would You Drink the Water?

The activity demonstrates the concept of parts per million as a measure for pollutants in contaminated water.

Materials

125 or 250 mL beakers
100 mL of water mixed with blue food coloring
Clear water
10 mL graduated cylinder or pipette
Copy of City of Lubbock Water Quality Report



Introduction

Show students a glass of water and ask how they know the water is safe to drink. Have the students list things they would like to know about the water before they drink it. Why would they drink water from a faucet but not from a mountain stream? Why would they drink water from a faucet here in the U.S. but not from a faucet in a third world country?

Demonstration

1. Carefully measure out 100 mL of water and mix with food coloring so that the water is a dark color. Tell students that this darkened water represents a pollutant.
2. Take 10 mL of the pollutant water and add it to 90 mL of clear water. Calculate the concentration (1 part per 10). Would they drink the water? What if they were really thirsty?
3. Take 10 mL of the diluted solution and add it to 90 mL of clear water. What is the concentration of the pollutant? (1 part per 100). Would they drink the water now? What if they were out in the middle of a desert?
4. Dilute the pollutant again by adding 10 mL of pollutant into 90 mL of clear water. What is the concentration now? (1 part per 1,000). This measurement is called ppt, or parts per thousand.
5. Repeat the dilution 3 more times until you reach parts per million. Would they drink the water now? The measurement, parts per million, or ppm is used to test for pollutants in water. Occasionally, some measurements are done in ppb, or parts per billion. Emphasize that all tap water and bottled water have contaminants, but those contaminants do not necessarily pose a health risk because they are so dilute.