Name _____

Parts per Million

Overview

Some volumes are so small it is impossible to measure them with a graduated cylinder or syringe. You will perform a serial (repeated) dilution of food coloring to understand concentration levels of parts per million (ppm) and parts per billion (ppb).

Materials

Chemplate
Medicine dropper
Dropper bottle of dye
Red pencil
Dropper bottle of pure water
Container of wash water
Paper towel
White paper

Procedure

1. Place a small piece of white paper under your Chemplate.
2. Put 5 drops of dye in cup 1 of the Chemplate.
3. Use the dropper bottle of water to put 9 drops of water into cup 2. Put one drop of dye into cup 2. Use your medicine dropper to mix the solution.
4. Place 1 drop of the solution from cup 2 into cup 3 with the medicine dropper. Wash the dropper in the rinse water. Add 9 drops of water, and stir with the medicine dropper.
5. Place one drop from cup 3 into cup 4. Rinse the medicine dropper. Add 9 drops of water from the bottle. Stir with the medicine dropper.
6. Repeat the procedure making dilutions until 5 -9 cups have been used.
7. Use the red pencil to record the colors of each solution in column 1 of the data table on the back of this page. Put a star by the cup in which color is no longer visible.
8. Determine the concentrations of the various cups and record them in column 2 of the data table. Cup 1 is a 1/10 concentration.
9. Answer questions 4 through 7.
10. Follow your teacher's directions for clean up and return of the materials.

Cup	Color	Concentration of Dye		
		Ratio to water	As a Decimal	In Scientific Notation
1				
2				
3				
4				
5				
6				
7				
8				
9				

Questions

4. What is the number of the cup in which the solution first appeared colorless? _____

5. What is the concentration of the solution in this cup?

_____

6. Do you think there is any food coloring present in this cup even though it is colorless?. Explain. _____

_____

_____

7. Can you think of an experiment you might do with the solutions to see what might be present if the water was removed? Before trying, get your teacher's permission. Record your results.

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