Name:

Making different concentrations of a solution

Think like a scientist

You will need:

- safety glasses
- test tubes
- test tube rack
- pipette
- two measuring cylinders, suitable for measuring 10 cm^3
- concentrated solution of food dye
- beaker of water

Method

1. Carefully measure out 10 cm^3 of the concentrated food dye solution. When you have added about the correct volume you can use the pipette to add or remove the final amount drop-by-drop, so that your measurement is as accurate as possible. Place it in a test tube and leave it in the test tube rack. This is solution A.
2. Carefully measure another 8 cm^3 of the concentrated food dye solution. Pour it into a test tube.
3. Measure out 2 cm^3 water and add it to the 8 cm^3 of food dye. Leave it in the test tube rack. This is solution B.
4. Use the table below to make up food dye solutions C, D and E. Place the solutions in the test tube rack, in order, from A–E.

Solution	Volume of concentrated food dye solution in cm^3	Volume of water in cm^3	Total volume in cm^3
A	10	0	10
B	8	2	10
C	6	4	10
D	4	6	10
E	2	8	10

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Continued

5 Look carefully at the solutions you have made.

Questions

1 What do you notice about the solutions?

2 How can you tell which is the least concentrated?

3 If you repeated this task using a salt or sugar solution, would you be able to identify the most and least concentrated solutions? Explain your answer.

4 Why is it important to measure the food dye solution and the water accurately?

5 If you only had a measuring cylinder that measured up to 100 cm^3, would using these same volumes of copper sulfate and water be accurate?

6 Compare the number of particles of food dye in the most concentrated solution of food dye and the most dilute solution.

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