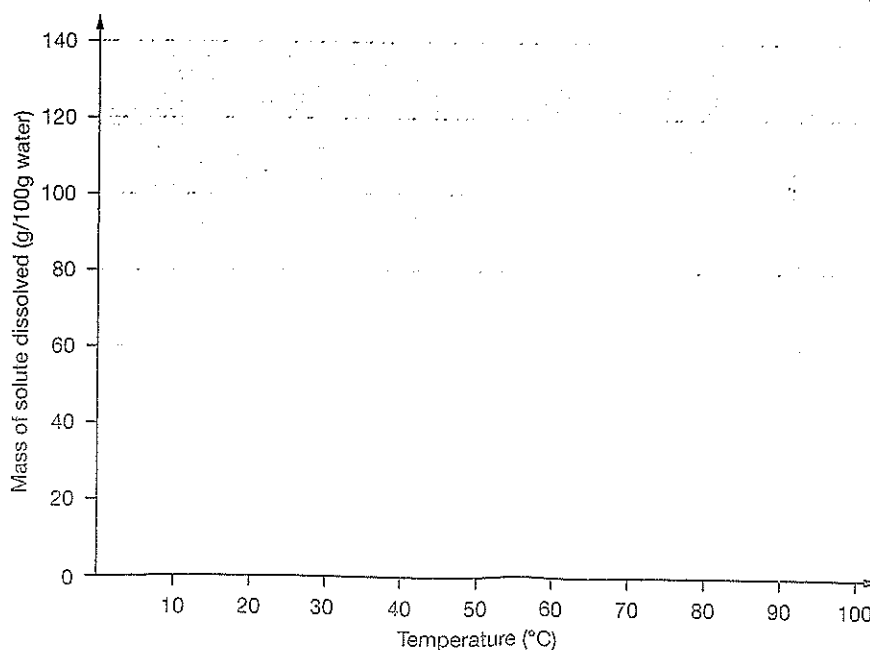




Marisa and Trevor did an experiment to find out if different substances have different solubilities as the temperature is changed. They tested how much copper sulphate would dissolve in water at different temperatures. Then they repeated the experiment for potassium sulphate. Their results are shown in the following table.

Temperature (°C)	How much copper sulfate dissolves (g per 100 g water)	How much potassium sulfate dissolves (g per 100 g water)
0	22.3	7.4
10	27.2	9.3
20	32.3	11.1
30	37.8	13.0
40	44.8	14.8
50	52.8	16.5
60	62.5	18.2
70	73.4	19.8
80	87.5	21.4
90	105.4	22.9
100	124.9	24.1

1 Construct a graph showing both of these sets of data below. (5 marks)



2. Deduce the effect of temperature on the solubility of both of these substances. (1 mark)

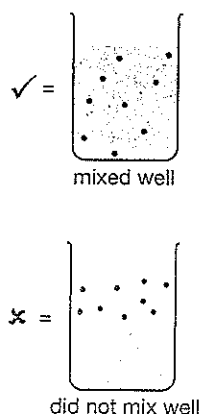
“The higher / lower the temperature, the less / more soluble the substances.

3. Identify which is more soluble at any temperature: Copper Sulfate or Potassium Sulfate.

(1 mark)

4. State whether copper sulphate or potassium sulphate is affected more by increasing the temperature. Justify your answer. (2 marks)

David and Sam did an experiment mixing different substances. They placed 5cm of a particular solvent in a test-tube, then added 1cm of a solute and shook them together to see if the solute dissolved. Their results are shown in the table below. A tick means they mixed well. A cross means they did not seem to mix, and separated out into two layers.



Solvent (5 cm in test-tube)	Solute (1 cm into test-tube of solvent in column 1)					
	Kerosene	Water	Methylated spirits	Cooking oil	Glycerol	White spirit
Kerosene	No need to do	✗	✗	✓	✗	✓
Water	✗	No need to do	✓	✗	✓	✗
Methylated spirits	✗	✓	No need to do	✗	✓	✗
Cooking oil	✓	✗	✗	No need to do	✗	✓
Glycerol	✗	✓	✓	✗	No need to do	✗
White spirit	✓	✗	✗	✓	✗	No need to do

5. Identify the solutes that dissolved in water. (1 mark)

---

6. Identify the solutes that dissolved in oil. (1 mark)

---

7. Identify the solvents that dissolved oil. (1 mark)

---

8. Identify the solutes that did not dissolve in oil. (1.5 marks)

---

9. Identify two solvents for:

(a) Methylated spirits \_\_\_\_\_ (1 mark)

(b) Kerosene \_\_\_\_\_ (1 mark)

(c) White spirit \_\_\_\_\_ (1 mark)

10. Identify a solute that dissolves in:

(a) Glycerol and also methylated spirits \_\_\_\_\_ (1 mark)

(b) Cooking oil and also kerosene \_\_\_\_\_ (1 mark)

11. State whether each of these mixtures would form a solution. Write “yes” or “no”.

(a) Kerosene in cooking oil \_\_\_\_\_ (0.5 marks)

(b) Water in glycerol \_\_\_\_\_ (0.5 marks)

(c) White spirit in kerosene \_\_\_\_\_ (0.5 marks)

(d) White spirit in water \_\_\_\_\_ (0.5 marks)

(e) Cooking oil in water \_\_\_\_\_ (0.5 marks)