



Name:

Worksheet: Solubility

Date:

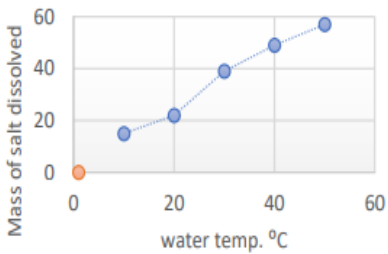
Grade 7CS -ALL Sections

Objective: To define solubility

To describe how temperature affect solubility

<p>When testing the effect of temperature on solubility: List the dependent variable, independent variable</p>	<p>Do you think different substances have the same solubility in water at the same temperature?</p>	<p>How do you control the investigation when testing the relation between temperature and solubility?</p>												
<p>Name the lab tools needed to investigate the effect of temperature on solubility</p>	<p>Define Solubility</p>	<p>Draw a line graph to represent the data of an investigation</p> <table border="1" data-bbox="1019 1194 1474 1434"> <thead> <tr> <th>Water temp. °C</th> <th>Mass of salt dissolved g</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>15</td> </tr> <tr> <td>20</td> <td>22</td> </tr> <tr> <td>30</td> <td>39</td> </tr> <tr> <td>40</td> <td>49</td> </tr> <tr> <td>50</td> <td>57</td> </tr> </tbody> </table>	Water temp. °C	Mass of salt dissolved g	10	15	20	22	30	39	40	49	50	57
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<p>Plan an investigation to test the effect of temperature on solubility</p>	<p>How does temperature affect solubility?</p>	<p>Create a multiple-choice quiz about solubility. (Write 3 questions)</p>												



<p>Independent variable: Temperature of the solvent (water)</p> <p>Dependent variable: (mass of solute dissolved)</p>	<p>No, different substances have different particles, so their solubility will vary.</p>	<ul style="list-style-type: none"> • Same volume of water • Same type of solute • Same stirring time
<ul style="list-style-type: none"> • Beakers • Spatula • Measuring cylinder • Balance • Thermometer • Stirring rod • Bunsen burner 	<p>It is a measurement of how much of a substance will dissolve in a given volume of a liquid at a specific temperature.</p>	
<ol style="list-style-type: none"> 1. Fill a beaker with a measured volume of water at room temperature. 2. Measure the mass of one spoonful of salt. 3. Start adding 1 spoonful of salt at a time, keep stirring until all the salt dissolved. 4. Record the number of spoonful in a table and calculate the mass dissolved in each beaker. 5. Repeat steps 1-4 with water at different temperatures as shown in table 1. 	<p>As the temperature increases, liquid particles will gain energy and move apart from each other, this will create more space for more particles to dissolve.</p>	

LAB REPORT

1) Writing a fully focused research question

What is the effect of **changing the temperature of the solvent (water)** on the **solubility** measured by **the mass of solute dissolved in 100cm³ of water at specific temperature?**

2) **Hypothesis:** *Outline a hypothesis to predict the outcome of the experiment and explain it using logical scientific reasoning (what do you think is going to happen).*

If the **temperature of the solvent (water)** _____ **increases** _____
(State the IV) (increase, decrease, or change)

then the **mass of solute dissolved** _____ will _____ **increases** _____
(State the DV) (increase, decrease, stay the same, or change)

3) **Scientific explanation for hypothesis** *(This is the explanation to the previous hypothesis. Why do you think that your hypothesis is correct? Explain it in detail with reasons and causes.*

Solubility is a measurement of the maximum mass of a substance which will dissolve in 100g of water at a particular temperature. The solubility of solids in water varies with changes in temperature.

As the temperature increases, there will be more spaces between liquid particles and this will provide extra spaces for solute particles to dissolve.

4) Manipulating the variables:

Controlled Variable	How will you keep this controlled? Stating the values and the equipment that you will be using	How could it affect your results if not controlled?
Volume of water	Use a measuring cylinder	Different amount of water will change the mass of solute that can be dissolved
Type of solute	Use one type of salt	Different solutes have different particle size, so this will affect the solubility
Stirring time and speed	Stop watch	Stirring does not affect solubility directly, but it helps to speed up dissolving

5) Materials and Method:

- State your materials [number needed + units] (Be descriptive, example: 10cm³ graduated cylinder)

Water **Ice** **Salt** **balance**
Bunsen burner **Beakers** **Measuring cylinder** **Spatula**
Stirring rod **thermometer**

- Method : What are the steps of the investigation?**
 - Fill a beaker with a measured volume of water at room temperature.**
 - Measure the mass of one spoonful of salt.**
 - Start adding 1 spoonful of salt at a time, keep stirring until all the salt dissolved.**
 - Record the number of spoonful in a table and calculate the mass dissolved in each beaker in table 1.**
 - Repeat steps 1-4 with water at different temperatures as shown in table 1.**

6) Safety precautions

- Care should be taken when using the hot beakers to avoid burns.
- Standard fire precautions should be taken (hair tied back, loose clothing secured or removed, etc).
- Goggles and aprons must be worn.
- Wash hands with soap and water before leaving the laboratory

7) Results

- Data

Water temp. °C	Mass of salt dissolved g
10	15
20	22
30	39
40	49
50	57

Table 1

Conclusion and evaluation:

Restating the purpose (hypothesis)

If the temperature of the solvent (water) then the mass of solute dissolved will increase

Interpret your data and describe a conclusion based on your results.

The table shows that at 10°C the mass of salt dissolved was 15g, and at 30°C the mass increased into 39g, and kept increasing as the temperature increases.

Determine whether the original hypothesis was supported or rejected by the investigation?

It was supported