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**Knowledge Rich Curriculum Plan**

SCIENCE- Solubility



| **Lesson/Learning Sequence** | **Intended Knowledge:**  *Students will know that…* | **Prior Knowledge:**  *In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment** | **Support** |
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| **01**  **Solubility** | *The definition of solute to be the solid that is dissolves in the solvent, solvent to be the liquid that the solute dissolves into, soluble is something that can dissolve, insoluble is something that cannot be dissolved and solution is when a solute has dissolved into a solvent.*  *Identify whether substances are soluble or insoluble*  *Identify solutes and solvents in different scenarios*  *Identify when a substance is a solution containing soluble solutes and when it remains a mixture*  *HT: To be able to explain that when a solute dissolve its particles must fit in the spaces between solvent particles.* | *The definition for independent, dependent and control variables.*  *Identification of some soluble (sugar and salt) and insoluble substances (sand and ceramics)*  *To improve the accuracy of the experiment you can repeat the experiment or use more accurate equipment.*  *The particle model diagrams can be recognised and explained.* | *Identifying variables*  *Using safety precautions to show good laboratory practice.*  *Identifying ways to improve accuracy, reliability and reproducibility of results.*  *Comparison of results* | *Solute- A solid that is dissolved into a liquid*  *Solvent- The liquid that a solute is dissolved into*  *Soluble- Something that can dissolve*  *Insoluble- Something that cannot dissolve*  *Solution- A solute dissolved into a solvent*  *Mixture- two or more elements/compound that are not chemically bonded together*  *Disintegrating- to break up into small parts* | Retrieval questions  Simple exam questions  Homework quiz 1  End of topic test  Summative assessment 2 | <https://www.bbc.co.uk/bitesize/guides/z4s48mn/revision/1>  <https://www.youtube.com/watch?v=6nEH2XlcJt8>  <https://www.youtube.com/watch?v=fc2zyrVR4kA>  Knowledge organiser (provided on Teams and in class) |
| **02**  **Solubility and temperature practical** | *When the water particles are cold, they move slowly. When the water particles are hot, they move quickly. The hotter the water, the quicker the particles will collide with the sugar and the bonds will be broken more easily. Students will learn to plan a safe and valid (a measure of how correct the results of an experiment are) experiment into the solubility of sugar and water. They will learn to observe changes and record results for example; the effects of temperature on solubility.* | *The definition for independent, dependent and control variables.*  *The particle model diagrams can be recognised and explained.*  *Safety precautions to be hair tied back, stand up at all times, safety goggles on.*  *To match the correct scientific equipment with the function used.*  *The effect of higher temperatures to increase the motion of particles* | *Identifying variables*  *Using safety precautions to show good laboratory practice.*  *Designing a suitable table to record results.*  *To plot results on a graph and draw the line of best fit* | *Saturated- holding the maximum mass of water*  *Solubility- the likelihood of a substance to be able to be dissolved*  *Versatile- to be able to adapt or be adapted*  *Collide- to come together* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 2* | [*https://www.youtube.com/watch?v=mGCs-JgkaS8*](https://www.youtube.com/watch?v=mGCs-JgkaS8)  [*https://www.youtube.com/watch?v=tpueIGLkrKM*](https://www.youtube.com/watch?v=tpueIGLkrKM)  Knowledge organiser (provided on Teams and in class) |
| **03**  **Solubility and temperature write up** | *They will learn to observe changes and record results for example; the effects of temperature on solubility. They will learn how to calculate the mean and removing the anomalous result/s.*  *To be able to record results to the same significant figures, regardless of the value. For example, 25.5 and 25.0.* | *The definition of solubility to be of how well a solute dissolve into a solvent. The particle model diagrams can be recognised and explained.*  *Safety precautions to be hair tied back, stand up at all times, safety goggles on.*  *HT: To be able to measure temperature to a 0.5oC accuracy. The units of temperature at KS3 to be degrees Celsius and that the units of the measurements are included in the column headings* | *Calculating mean and removing anomalies*  *Recording data*  *Drawing conclusions from the data* | *Anomaly- a data point that is not in line with the rest of the data*  *Mean- A summary of a given group of data*  *Conclusion- a judgement or decision is reached by reasoning*  *Reliable- consistently good in quality or performance* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 2* | [*https://www.youtube.com/watch?v=mGCs-JgkaS8*](https://www.youtube.com/watch?v=mGCs-JgkaS8)  [*https://www.youtube.com/watch?v=tpueIGLkrKM*](https://www.youtube.com/watch?v=tpueIGLkrKM) |
| **04**  **Saturation** | *Students will recognise that stirring and/or increasing the volume does not affect a substances solubility.*  *Students will be able to determine the point at which a solute is no longer soluble in a solution by interpreting data.*  *Students will be able to predict observable changes when a saturated solution is cooled. Draw conclusions from a solubility graph.* | *Students need to already know the definition of solubility 'the ability of a substance to be dissolved'*  *Students will need to know how to hypothesise a practical result.* | *Read data accurately from a table and recording results on a graph.* |  | *Retrieval questions*  *Simple exam questions*  *Homework quiz 2*  [*https://www.satchelone.com/quizzes/66891224-assessment--variables-quiz*](https://www.satchelone.com/quizzes/66891224-assessment--variables-quiz)  *End of topic test*  *Summative assessment 2* | [*https://www.bbc.co.uk/bitesize/guides/zc9q7ty/revision/6*](https://www.bbc.co.uk/bitesize/guides/zc9q7ty/revision/6) |
| **05**  **Solubility graphs** | *The independent variable is plotted on the x axis of the graph. The dependent variable is plotted on the y axis of the graph. Identification of the variables present on the graph. Students will be able to use an appropriate scale when drawing graphs. They will learn that a graph needs a title, axis title, axis units and a line of best fit (in Science, a line or best fit can be curved)* | *Students need to be able to identify the relationship between variables on a graph/table.* | *Drawing the lines of best fit*  *Plot data on a graph* | *Independent – something that is changed in the practical*  *Dependent- something that is measured in the practical*  *Control- something that is kept the same*  *Plot – A technique used to represent a data set* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 2*  *End of topic test*  *Summative assessment 2* | [*https://www.youtube.com/watch?v=bODStxmFrNI*](https://www.youtube.com/watch?v=bODStxmFrNI)  [*https://www.youtube.com/watch?v=0A55QRyJHPM*](https://www.youtube.com/watch?v=0A55QRyJHPM) |