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**Knowledge Rich Curriculum Plan**

SCIENCE- Safety Project



| **Lesson/Learning Sequence** | **Intended Knowledge:**  *Students will know that…* | **Prior Knowledge:**  *In order to know this…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment** | **Support** |
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| ***How to stay safe in a lab*** | *Students will know that hazards are things that have the potential to cause harm. Students will know that there are school laboratory safety rules that include; to not enter the lab without a member of staff, put bags/coats under the tables, tie long hair back, heat things carefully, tell your teacher if there is an accident immediately, let apparatus cool down before handling, no eating or drinking in the laboratory.* | *Students will have knowledge that Science labs can be dangerous and to be careful when handling substances.* |  | *Harm- physical injury*  *Apparatus- technical equipment*  *Substances- A type of material/matter* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)* |
| ***Hazard Symbols*** | *Students will know that hazard symbols help to identify quickly in any language. Students will be able to state the hazard symbols related to the following safety concerns; toxic/poisonous, corrosive, flammable, Irritant/harmful, explosive, environmentally hazardous, danger to heath and oxidising. Students will be able to state the safety precautions needed to decrease the risk of harm; do not eat, wear goggles, keep away from flames, keep up spills immediately, wash hands with cold water immediately, do not dispose of down the sink and use a fume hood (when necessary)* | * *Students will have knowledge of some substances been hazardous to health* |  | *Explosive- A reactive substance*  *Irritant- a substance that causes inflammation*  *Oxidising- combines chemically with oxygen*  *Corrosive- causes the wearing a way of a substance*  *Dispose- to get rid of or disposing away*  *Poisonous- causing or capable of causing death*  *Toxic- very harmful*  *Precaution- A measure taken in advance to prevent something dangers* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*  <https://www.bbc.co.uk/bitesize/topics/zsg6m39/articles/zyc9r2p> |
| ***Science Apparatus*** | *Students will be able to explain that apparatus is the technical equipment or machinery needed for a particular activity or purpose. Students will have the knowledge that each piece of apparatus has a particular function and that a function is the job/role of that piece of apparatus. Students will be able to identify thermometer, test tube, Bunsen burner, beaker, wire gauze, test tube holder, tripod, evaporating dish, clamp and stand, measuring cylinder, funnel, conical flask, electronic balance, spatula, pipettes, glass stirring rod and test tube racks, from images. Students will be able to explain what each of the following pieces of apparatus is used for. Test tube racks are used for holding and organising test tubes on the laboratory counter, Grass stirring rods are used for stirring, pipettes are used for measuring and delivering exact volumes of liquids, a spatula is used to dispense solid chemicals from their containers, an electronic balance is used for measuring masses, test tube holders are used to hold test tubes that are too hot to handle, a thermometer is used to measure the temperature of substances, a test tube is used to hold small amounts of substances, a Bunsen burner is used to heat substances, a beaker holds solids or liquids that will not release gases when reacting or are unlikely to splatter if stirred or heated, a wire gauze is used to provide a place on the tripod to stand a beaker, tripods are used to balance equipment on when heating, evaporating dish is used for the heating of stable solid elements and compounds, a clamp and stand is used for holding other equipment in place, a measuring cylinder is used to measure volumes of liquid and a funnel is used to transfer liquid from one vessel to another.* | *Some students may have prior knowledge from secondary school primary session and KS2 practical activities, using apparatus.* |  | *Thermometer- A piece of apparatus used to measure temperature*  *Function- a purpose or job*  *Bunsen burner- A piece of apparatus used to heat a substance*  *Pipette- A piece of apparatus used to measure a small volume of a liquid*  *Vessel- A hollow container* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/guides/zq7xjty/revision/1*](https://www.bbc.co.uk/bitesize/guides/zq7xjty/revision/1) |
| ***Taking Measurements of temperature*** | *Students will state what is meant by temperature, it is a measure of how hot something is and be able to read the piece of equipment used to measure temperature; thermometer and know the unit for temperature is degrees Celsius. Students will be able to take temperature readings accurately from a horizontal view point of the meniscus. Students will be able to perform a practical safety using the correct apparatus and lab rules (as stated above) and evaluate results in comparison to their predictions 'were you correct?' and 'explain your reasoning'. Students will be able to state what is meant by an outlier - something that differs from all the other results in a particular group/data sets. Students will be able to identify the outliers in a set of results.* | *Some students may have prior knowledge from secondary school primary session and KS2 practical activities, understanding hot and cold and using a thermometer to measure temperature. Some students may have prior knowledge from secondary school primary session and KS2 practical activities, in identifying the correct apparatus and moving around a laboratory and conducting a practical safely. Some students may have prior knowledge from secondary school primary sessions and KS2 practical activities in evaluating data and identifying any anomalies.* |  | *Temperature- A measure of the amount of heat energy*  *Meniscus- the curve in a measuring cylinder*  *Evaluate- form an idea*  *Predict- to estimate something*  *Comparison- the similarities and differences in data* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.youtube.com/watch?v=ZXTx4jAKEvA*](https://www.youtube.com/watch?v=ZXTx4jAKEvA) |
| ***Taking measurements of time, mass and volume*** | *Students will be able to state that seconds are the unit of time. Students will be able to identify the minutes, seconds and deci-seconds from a digital stop watch. Students will be able to state that an electronic balance is used to measure mass (common misconception addressed- not a scale). Students will know that the unit of mass is grams. Students will develop their group skills by performing a group practical activity and recording their results in a table. Students will be able to draw an appropriate table with the correct headers and units. Students will know that we use measuring cylinders to measure a volume and that the units are cm^3 (common misconception is the use of ml/l). Understanding hot and cold and using a thermometer to measure temperature and that temperature is measured with the unit degrees Celsius.* | *Some students may have prior knowledge from secondary school primary sessions and KS2 practical activities in measuring mass and identifying the units for mass. Some students may have prior experience in group work from KS2. Some students may have prior knowledge from secondary school primary sessions and KS2 practical activities in measuring volumes and that the units are cm^3.* |  | *Misconception- a view/opinion that is incorrect*  *Scale- A set of numbers that help to measure or quantify objects*  *Volume- the amount of space that an object/substance specifies*  *Mass- A body of matter* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*  [*https://sciencing.com/tools-used-measure-mass-5305130.html*](https://sciencing.com/tools-used-measure-mass-5305130.html) |
| ***How to use a Bunsen burner*** | *Students will be able to name the parts of a Bunsen burner; heat proof mat, flame (outer cone/inner core), chimney, air hole, base and rubber tubing. Misconception that Bunsen must be capitalised as it is someone’s name. Students will be able to safely set up a Bunsen burner. Wear goggles, tie long hair back, check the tubing, do not touch hot equipment, leave to cool. Students will collect their equipment, place on a heat proof mat near to a gas tap, connect the Bunsen burner to the gas tap, close the air hole, collect a lit splint, turn the gas on and carefully light the Bunsen burner. Students will be able to identify that the blue flame is the hottest and that the yellow is the smokiest.* | *Students may have prior knowledge of using Bunsen burners from secondary school primary sessions. Students may have prior knowledge in conducting practical safely.* |  | *Capitalised- the chance to take advantage*  *Splint- A thin strip of wood used to light a fire*  *Combustion- the process of burning something* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.google.com/search?q=how+to+light+a+bunsen+burner+safely&rlz=1C1GCEB\_enGB998GB998&oq=how+to+light+a+Bunsen+burner&aqs=chrome.1.0i512l3j0i22i30l3j0i390l2.5186j0j9&sourceid=chrome&ie=UTF-8#kpvalbx=\_inq1YqLQAsmcgQaWjpzwBQ15*](https://www.google.com/search?q=how+to+light+a+bunsen+burner+safely&rlz=1C1GCEB_enGB998GB998&oq=how+to+light+a+Bunsen+burner&aqs=chrome.1.0i512l3j0i22i30l3j0i390l2.5186j0j9&sourceid=chrome&ie=UTF-8#kpvalbx=_inq1YqLQAsmcgQaWjpzwBQ15) |
| ***Testing and purification of polluted water*** | *Students will be able to recall the names and purpose of science apparatus to perform practical activity. Students will be able to recall and use the safety precautions in order reduce risk when performing the practical activity. Students will be able to apply their knowledge and consolidate their practical skills when performing the practical activity. The mixture will be filtered to remove insoluble solids. The mixture will then be heated to remove salt. The water vapour collected will then be condensed*. *Misconceptions- Using a capital B for Bunsen burner, using balance instead of scale, using cm^3 instead of ml/l.* | *Students will already know how to identify hazards in a laboratory and apply safety precautions to reduce risk. Students need to already know how to select the appropriate apparatus for the correct purpose in the activity.* |  | *Risk- A situation involving the exposure to danger*  *Filtration- the process of removing a solid from a mixture*  *Condensation- the process of a gas turning to a liquid*  *Evaporation- the process of turning a liquid to a gas that occurs on the surface of the liquid*  *Balance- A piece of apparatus used to measure mass*  *Insoluble- something that cannot dissolve* | *Retrieval questions*  *Simple exam questions*  *Baseline assessment*  *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*  [*https://edu.rsc.org/primary-science/how-to-purify-water/4012058.article*](https://edu.rsc.org/primary-science/how-to-purify-water/4012058.article) |