Scheme of Work and Learning Plan

Title: Acids and alkalis – Awesome chemicals or a complete nuisance?

Opportunities for each strategy MUST be included in each 3 lesson phase literacy structured group work [Kagan] independent learning active questioning

| Learning loops: (including dialogic feedback and connections within and between schemes) | Resources / ICT links: |
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| Students can create their own learning loops throughout all of the lesson through peer assessment and commenting on one anothers work.<br>Pupils end each lesson with: In this lesson I have learnt....because I can.....To improve I need to ..... (effectively SWANing their own work each lesson).<br>Connections **within** the scheme: types of chemical reactions.<br>Connections **between** schemes: categorising Chemical reactions | L7: Per group: 2 x test tubes, 1 – 2 spatulas of Copper carbonate, 10ml measuring cylinder, 0.4M Hydrochloric acid, Limewater, Delivery tube and bung to fit, test tubes<br>L8: Per group: A selection of metallic and non-metallic materials, 2-3 magnifying glasses, bowl half filled with water, paper towel to dry materials, lamps (up to 6V), 3 wires, Power supply, 2 x crocodile clips, Instruction sheet for this experiment<br>L9: Demo: Splints, matches, spatula, carbon powder, iron fillings, magnesium ribbon, Bunsen safety sheets (if requested) |
| Learning Objectives for the 3 sessions:<br>L7: Are acids the perfect chemical treatment, coca cola's ally or a thorn in society's side?<br>L8: Why do plastic, glass and iron behave differently?<br>L9: Carbon monoxide testers an essential or a fad? | Key Vocabulary the students will use by the end of the 3 sessions:<br>Word equation, method, results, conclusion, evaluation, metals, non-metals, Periodic Table, fire triangle, Bunsen burner |

| | Learning Outcomes: (Using student friendly language – what will the students learn?) | Starter: (quick snappy activities that may include the closure of a feedback and forward loop) | Main Teaching Prompts: (an overview of the lesson content – including progress checks) | Follow Up Activities: (to support, extend and challenge – alternative differentiated activities) | Differentiated Approaches: (to support students to meet objectives) | Plenaries: (activity to assess progress and inform next phase of learning) |
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| seven | **All Pupils:** Should be able to record observations. **(Level 4)**<br><br>**Most Pupils:** Should be able to recall the test for carbon dioxide. **(Level 5)**<br><br>**Some Pupils:** Should also be able to complete word equations. **(Level 6)** | **All of a muddle** Give pupils the steps of the practical suggested for this lesson, but in the wrong order. They must put the steps into the correct order. (5 mins) | Introduce metal carbonates as the main mineral in many rocks: calcium carbonate in limestone, copper carbonate in malachite. Introduce the practical – Carbonates and Acid - and explain how to carry it out. You may wish to get pupils to collect some of the gas, rather than bubbling it through limewater. They could then test it in the same way as in C1.7 and prove that the gas collected was not hydrogen. Discuss with the group the fact that the limewater turning milky is a test for the presence of carbon dioxide gas and that when acids react with carbonates, carbon dioxide is always produced. Carbonates are the basis for many antacid remedies. That's why they can taste chalky; they are often made from chalk. The carbonate reacts with excess stomach acid. Carbon dioxide is released, which is why taking an indigestion remedy can give you wind. Students need to write up the experiment with a Diagram; Method; Results; Conclusion; Evaluation | | | **Sort it out!** Give pupils the key words (carbonate, carbon dioxide and limewater) as anagrams. Ask them to sort the words out and then write a sentence which includes each word. (10 mins) |

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| eight | **All Pupils:** Should be able to group some metals and non metals. **(Level 4)**<br><br>**Most Pupils:** Should be able to recall the physical properties of metals and non metals. **(Level 5)**<br><br>**Some Pupils:** Should also be able to explain why a material is a metal or non metal. **(Level 6)** | **Is it a metal?** Give pupils a list of materials and ask them to divide them up into 'metallic' and 'non-metallic'. Ask them to give a reason why they put each one into a particular group. (5 mins) | Show the class a Periodic Table and ask them to pick out the names of elements which they know to be metals. Explain that there are lots of metals on the Periodic Table and that they must come up with a set of 'rules' which describe what a metal is, while carrying out the main activity. Ask pupils to carry out the practical 'Classifying metals and non-metals', as a circus of activities. Many of the materials pupils meet in the practical may not pure metals and non-metals in the elemental sense; they do not appear on the Periodic Table. However, the aim of this lesson is to convey typical metallic and non-metallic properties. | | | **That can't be right?** Show that a piece of graphite will conduct electricity even though it is a form of the non-metal carbon. Challenge pupils to say why it is probably still a non-metal. [Dull appearance, not sonorous, brittle, other forms of carbon, such as diamond, do not conduct electricity.] (5 mins) |

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| nine | **All Pupils:** Should be able to set up a Bunsen burner safely. **(Level 4)**<br><br>**Most Pupils:** Should be able to explain the laboratory safety rules. **(Level 5)**<br><br>**Some Pupils:** Should also be able to write word equations for the reactions they have seen. **(Level 6)** | **Who was he?** If Internet connection is available, ask pupils to find out who Robert Wilhelm Bunsen, who is credited with the invention of the Bunsen burner, was. Pupils who complete this quickly could try to think how a Bunsen burner might work. (10–15 mins) | Remind pupils about the general laboratory safety rules, especially those relating to experiments. They may have had access to or seen a Bunsen burner in earlier lessons, but the focus here is on getting the pupils to use one correctly. Ask them if they have heard of the fire triangle. If anyone knows, ask them to explain what it means. It may be useful here to have a lit candle class as a visual prompt. It may be best to demonstrate all of this before allowing the pupils access to the apparatus. Explain to pupils that opening the air hole allows air to mix with the fuel (gas) and makes the flame hotter. The role of oxygen will be dealt with next lesson. Ask pupils to share their observations. | | | **Bunsen's rule!** Ask pupils to write a set of instructions to allow other Year 7 pupils to use a Bunsen burner safely. Their instructions should cover setting up and lighting the burner, and how and when to use the safety flame. (5–10 mins) |

DQ- Differentiation by questioning, DT- Differentiation by task/ activity, DO- Differentiation by outcome, DG- Differentiation by grouping, DR- Differentiation by resources

Home Learning:

L7:
L8:
L9:

Additional notes:

Learner progress:
(detail at cohort and individual level)