

Year 8 Chemistry Unit - What's The Matter

Inquiry: Establishing the Purpose of the Unit

Statement of Inquiry:

Scientists' understanding of matter has allowed society to design better materials and products to improve our world.

Concepts: Change, Patterns, Interaction

IB Objectives:

Objective A: Knowing and Understanding

- i. describe scientific knowledge
- ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations
- iii. analyse information to make scientifically supported judgements

Objective B: Inquiring and Designing

- i. describe a problem or question to be tested by a scientific investigation
- ii. outline a testable hypothesis and explain it using scientific reasoning
- iii. describe how to manipulate the variables, and describe how data will be collected
- iv. design scientific investigations.

Objective D: Reflecting on the Impact of Science

- i. describe ways in which science is applied and used to address a scientific problem or issue
- ii. discuss and analyse the various implications of the use of science and its application in solving a specific problem or issue
- iii. apply scientific language effectively
- iv. document the work of others and sources of information used.

<p>ACARA Achievement Standards:</p> <p>By the end of Year 8</p> <ul style="list-style-type: none"> • Students compare physical and chemical changes and use the particle model to explain and predict the properties and behaviours of substances. • Students examine the different science knowledge used in occupations. • Students explain how evidence has led to an improved understanding of a scientific idea and describe situations in which scientists collaborated to generate solutions to contemporary problems. • Students identify and construct questions and problems that they can investigate scientifically. • Students consider safety and ethics when planning investigations, including designing field or experimental methods. • Students identify variables to be changed, measured and controlled. • Students construct representations of their data to reveal and analyse patterns and trends, and use these when justifying their conclusions. • Students explain how modifications to methods could improve the quality of their data and apply their own scientific knowledge and investigation findings to evaluate claims made by others. • Students use appropriate language and representations to communicate science ideas, methods and findings in a range of text types. 	<p>ACARA Content Descriptors:</p> <ul style="list-style-type: none"> • The properties of the different states of matter can be explained in terms of the motion and arrangement of particles (ACSSU151) • Differences between elements, compounds and mixtures can be described at a particle level (ACSSU152) • Chemical change involves substances reacting to form new substances (ACSSU225) <p>Questioning and predicting</p> <ul style="list-style-type: none"> • Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (AC SIS139) <p>Planning and conducting</p> <ul style="list-style-type: none"> • Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (AC SIS140) • In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task (AC SIS141) <p>Processing and analysing data and information</p> <ul style="list-style-type: none"> • Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate (AC SIS144) • Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions (AC SIS145) <p>Evaluating</p> <ul style="list-style-type: none"> • Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method (AC SIS146) • Use scientific knowledge and findings from investigations to evaluate claims (AC SIS234) <p>Communicating</p> <ul style="list-style-type: none"> • Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (AC SIS148)
<p style="text-align: center;">General Capabilities/Cross-Curricular Priorities:</p> <ul style="list-style-type: none"> • Literacy 	

<p>Summative Assessment:</p> <p>There will be 2 summative tasks in this unit.</p> <p>Task 1: Students will design an experiment to investigate the effects of salt concentration on metal corrosion. This task will also include an introduction on the impacts of science. Criteria B, and D.</p> <p>Task 2: The unit will end with a summative topic test. Criterion A.</p>	<p>Formative Assessment:</p> <p>Formative assessment will occur through a number of quizzes throughout the unit.</p>
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Approaches to Learning (ATL)

Communication: oral and written communication in research tasks and class discussions

Thinking: problem solving tasks in design practical summative and questions following practical tasks

Research: research based tasks on elements in the classroom, reaction types, summative design practical

Self-management: conducting ongoing revision, medium-term assessment tasks

Content

- Classification and the Periodic Table
- Particle Theory
- Solids, Liquids, Gases
- Elements, Molecules, and Compounds
- Mixtures
- Metals and Non-Metals
- Chemical Reactions
- Word Equations
- Endothermic and Exothermic Reactions

Learning Experiences and Teaching Strategies

Students will learn through a variety of physical, visual, verbal, and social strategies.

Physical: Physical strategies are encompassed by practical experimentation and hands-on activities such as the classification bags

Visual: Visual strategies will be employed using powerpoint presentations, videos, and diagrams. Students will also create their own visual representations of information through posters, and drawing their own diagrams.

Verbal: Verbal strategies will be included with class discussions, short lecture style presentations with Q&A components, and research tasks.

Social: Social strategies will be included with work in small groups and pairs during research tasks and practical experimentation.

Resources

- Laptops
- Science By Doing - experiments
- Pre-test worksheets and powerpoint
- Yellow Booklets - periodic table
- Red Booklets - chemical reactions
- Orange Booklets - unit revision and Blue Answer Booklets
- Classification bags - sequins, pasta, balloons, paper shapes etc.
- Design : task sheets - summative assessment
- YouTube videos: Brainiac: Alkali Metals - <https://www.youtube.com/watch?v=m55kgyApYrY> Brainiac: Walking on Custard - <https://www.youtube.com/watch?v=JkS1ymQ73oc> Chemical Reactions - <https://www.youtube.com/watch?v=FofPjj7v414>
- Topic Test Booklets