



Big Question: How real is your Clogau Gold jewellery?

AoLE: Science and Technology	Subject: Chemistry	Year: 8
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Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
How real is your Clogau Gold jewellery?	This unit uses the context of jewellery to examine how we sort and classify materials. This includes the classification of elements into metals and non-metals and revision of previous work on solids, liquids and gases. The unit also develops the more advanced concepts of elements and compounds and links these to the more abstract ideas of particle models and chemical formulae. The unit then extends understanding by considering particles, equations, symbols and formulae. Through the theme, the unit deals with the differences between elements, compounds and mixtures, and considers the properties and uses of alloys. It also revises ideas about chemical reactions and the effect of heat on materials is considered in relation to physical and chemical properties.	<p>From KS2 and previous units most pupils will:</p> <ul style="list-style-type: none"> • know the differences between solids, liquids and gases. • be able to describe changes of state. • know about the particle theory of solids, liquids and gases. • be able to name some elements. • state that there are about 100 elements. • state that elements are made up of atoms. • explain that when elements join together compounds are formed. • have ideas about temperature, melting points and boiling points. • be able to recognise a particle model as a tool with which to explain the behaviour and properties of solids, liquids and gasses and elements, compounds and mixtures.

What does progression look like in this Big Question?

Progression Indicator	Description of learning (What matters statements)	Student evidence of progression (Blooms) / Knowledge
Excelling	<p>I independently identify questions that can be investigated scientifically and suggest suitable methods of inquiry.</p> <p>I can suggest detailed conclusions as a result of carrying out my inquiries.</p> <p>I can evaluate methods to suggest improvements.</p> <p>I can engage with scientific and technological evidence to inform my own opinions.</p> <p>I can understand how my actions and the actions of others' impact on the environment.</p> <p>I can describe the impacts of science and technology, past and present, in my everyday life.</p> <p>I can apply my knowledge and skills when making design decisions in order to produce specific outcomes.</p> <p>I can consider how my design proposals will solve problems and how this may affect the environment.</p> <p>I can use design communication methods to develop and present ideas, and respond to feedback</p> <p>I can select and safely use appropriate tools, materials and equipment to construct</p>	<p>Use chemical formulae to represent chemical compounds.</p> <p>Explain why the periodic table is more successful at classification than some of the preceding attempts.</p> <p>Plan to collect valid and reliable results.</p> <p>Evaluate evidence, explaining why it is or why it is not good evidence.</p> <p>Predict the properties of elements by looking at the properties of other elements in the same group.</p> <p>Identify some elements whose properties do not fit the general patterns of the periodic table.</p> <p>Work out a chemical formula from a molecular diagram, and vice versa.</p> <p>Use simple chemical formulae to work out the types and numbers of atoms in the compound.</p> <p>Use ideas about atoms and bonding to explain why mixtures do not have fixed melting and boiling points.</p>



	<p>purposeful outcomes. I can recognise that changes in materials affect their properties and uses under different conditions. I can recognise that our planet provides natural materials and can explain why they may have been processed to make them useful.</p>	<p>Evaluate an investigation and suggest improvements to methods. Suggest alternative methods to test conclusions. Represent chemical reactions using balanced symbol equations. Predict the purity of a substance based on melting point information. State that a compound always contains the same elements in fixed proportions. Use simple chemical formulae to work out the types and numbers of atoms in the compound. Use ideas about atoms and bonding to explain why mixtures do not have fixed melting and boiling points. Evaluate an investigation and suggest improvements to methods. Suggest additional practical work to test conclusions. Represent chemical reactions using balanced symbol equations. Predict the purity of a substance based on melting point information. State that a compound always contains the same elements in fixed proportions.</p>
Advancing	<p>I can identify questions that can be investigated scientifically and suggest suitable methods of inquiry. I can suggest conclusions as a result of carrying out my inquiries. I can evaluate methods to suggest improvements. I can engage with scientific and technological evidence to inform my own opinions. I can understand how my actions and the actions of others' impact on the environment. I can describe the impacts of science and technology, past and present, in my everyday life. I can apply my knowledge and skills when making design decisions in order to produce specific outcomes. I can consider how my design proposals will solve problems and how this may affect the environment. I can use design communication methods to develop and present ideas, and respond to feedback. I can select and safely use appropriate tools, materials and equipment to construct purposeful outcomes. I can recognise that changes in materials affect their properties and uses under different conditions. I can recognise that our planet provides natural materials and can explain why they may have been processed to make them useful.</p>	<p>Explain how the periodic table is organised. Explain the benefits and drawbacks associated with recycling. Represent elements using chemical symbols. Carry out a number of practical methods using a range of apparatus, being aware of the hazards involved. Use practical evidence or secondary sources to classify materials as metals and non-metals, or as elements and compounds. Use word equations for chemical reactions. Explain that when atoms of different elements combine, compounds are made. Use particle diagrams to tell the difference between elements, compounds and mixtures. Use the particle model to explain changes of state. Use ideas about atoms and bonding to explain why a substance is classified as an element, compound or mixture. Decide on the best way to do a range of tasks, including selecting sources of information and apparatus. Recognise chemical reactions as changes in which atoms join together in new ways. Recall that melting and boiling are changes of state that happen at fixed temperatures. Identify elements and simple compounds from their symbols or formulae. Use particle diagrams to tell the difference between elements, compounds and mixtures. Use the particle model to explain changes of state. Use ideas about atoms and bonding to explain why a substance is classified as an element, compound or mixture. Decide on the best way to do a range of tasks, including selecting sources of information and apparatus. Use word equations for chemical reactions. Recognise chemical reactions as changes in which atoms join together in new substances.</p>
Securing	<p>I can ask questions and use my experience to suggest simple methods of inquiry. I can recognise patterns from my observations and investigations and can communicate my findings.</p>	<p>Describe how the periodic table is used to classify the elements. Identify some materials that are metals. Explain why we recycle materials.</p>



	<p>I can use my knowledge and understanding to predict effects as part of my scientific exploration.</p> <p>I can recognise that what I do, and the things I use, can have an impact on my environment and on living things.</p> <p>I can explore relationships between living things, their habitats and their life cycles.</p> <p>I can observe and describe ways in which materials change when they are mixed together.</p> <p>I can investigate different forms of energy and how it can be transferred.</p> <p>I can identify things in the environment which may be harmful and can act to reduce the risks to myself and others.</p> <p>I can explore how different component parts work together.</p> <p>I can safely use a range of tools, materials and equipment to construct for a variety of reasons.</p> <p>I can identify things in the environment which may be harmful and can act to reduce the risks to myself and others.</p> <p>I can explore and describe the properties of materials and justify their uses.</p> <p>I can recognise patterns from my observations and investigations and can communicate my findings.</p> <p>I can safely use a range of tools, materials and equipment to construct for a variety of reasons.</p>	<p>Follow instructions and work safely during practical work.</p> <p>Use secondary sources to select information on materials and their properties.</p> <p>Discuss their ideas on resources and recycling.</p> <p>Recall the names of some metals.</p> <p>Recall that there are only a small number of elements and some of their names.</p> <p>Know the difference between chemical symbols for elements and compounds.</p> <p>Name a variety of common compounds using scientific terminology.</p> <p>Use a range of measurement methods to carry out a practical investigation.</p> <p>Measure mass and temperature.</p> <p>Follow instructions and work safely during practical work.</p> <p>Identify changes as chemical or physical.</p> <p>Use a range of measurement methods to carry out a practical investigation.</p> <p>Measure mass and temperature.</p> <p>Recognise when a substance changes state.</p> <p>Present data from investigations as line graphs.</p> <p>Identify changes as chemical or physical.</p> <p>Present data from investigations as line graphs using SALUTE to check understanding.</p> <p>Recall the meaning of the words melt and freeze.</p>
Beginning	<p>I can show curiosity and question how things work.</p> <p>I can explore the environment, make observations and communicate my ideas.</p> <p>I can design while I make and communicate about what I am making.</p> <p>I can safely use simple tools, materials and equipment to construct and deconstruct.</p> <p>I can explore the properties of materials and choose different materials for a particular use.</p> <p>I can identify, follow and begin to create sequences and patterns in everyday activities.</p> <p>I can explore the properties of materials and choose different materials for a particular use.</p> <p>I can identify, follow and begin to create sequences and patterns in everyday activities.</p> <p>I am beginning to follow a sequence of instructions.</p> <p>I can experiment with and identify uses of a range of computing technology in the world around me.</p>	<p>Identify some materials that are metals.</p> <p>Explain why we recycle materials.</p> <p>Follow instructions and work safely during practical work.</p> <p>Discuss their ideas on resources and recycling.</p> <p>Recall the names of some metals.</p> <p>Recall that there are only a small number of elements and some of their names.</p> <p>Know the difference between chemical symbols for elements and compounds.</p> <p>Measure mass and temperature.</p> <p>Follow instructions and work safely during practical work.</p> <p>Measure mass and temperature.</p> <p>Recognise when a substance changes state.</p> <p>Identify changes as chemical or physical.</p> <p>Present data from investigations as line graphs.</p> <p>Recall the meaning of the words melt and freeze.</p>

Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
<p>Students can link this topic to the famous Welsh Clogau gold company. Also can look at national international policies about reusing and recycling and the international demand</p>	<p>Numeracy</p> <ul style="list-style-type: none"> ● Students will collect data to suitable levels of accuracy and precision and calculate mean averages. ● Students will draw graphs and charts as required. ● Students will use SALUTE to self and peer assess their graphs. ● Students will use standard notation to represent chemical reactions. ● Students will read thermometers and understand scale and measurement.



	<p>Literacy</p> <ul style="list-style-type: none">• Students will read methods to carry out a series of instructions.• Students will write extended descriptions and explanations of the patterns in the periodic table.• Students will develop opposing arguments when discussing complex problems. <p>Cross-curricular</p> <ul style="list-style-type: none">• Students could use ideas about measurement and quantities in mathematics and technology.
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Assessment (How will we know that students have learnt what we taught them?)

<p>Formative assessment:</p> <p>Students will be provided with a range of assessment techniques throughout the topic to give them immediate feedback on a range of skills and knowledge required to progress in this topic in line with the whole school assessment policy.</p>	<p>Summative assessment:</p> <p>End of 'Biq Question' test x2 (mid topic and end of topic)</p> <p>Separating compounds and mixtures practical assessment</p>
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Evaluation (to be completed 2024)

Strengths	Areas for Development	Pupil Voice