



Big Question: Why do we recycle?

AoLE: Science & Technology	Subject: Science - Chemistry	Year: 7
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Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
Why do we recycle?	This unit looks at how different sorts of waste are disposed of in Wales and the UK and the problems this can cause. Within this context the different properties of solids, liquids and gases and the implications of their handling and storage are considered, together with an introduction to the particle theory of matter. It also introduces where many materials on Earth come from and the ways that different rock types are formed. It also concentrates on the various processes involved in the formation of sedimentary rocks – weathering, erosion, transport, deposition, compaction and cementation. The context for the unit is using materials from the Earth, and the need to study rocks to locate useful materials.	From KS2 most pupils will: <ul style="list-style-type: none"> • Be able to name the three states of matter and the main processes associated with state changes • Know some of the properties of solids, liquids and gases • Be able to describe and group rocks by their appearance, textures and ability to soak up water • Know that dissolved solids are left behind when water evaporates

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 can describe different types of chemical reactions, explain their uses and identify any effects of the products formed.</p> <p>I can use my knowledge of chemical reactions to explain what happens when conditions are changed.</p> <p>I can describe the impacts of science and technology, past and present, in my everyday life.</p> <p>I can understand how my actions and the actions of others impact on the environment and living things.</p> <p>I can engage with scientific and technological evidence to inform my own opinions.</p> <p>I can evaluate methods to suggest improvements.</p> <p>I can use my findings to draw valid conclusions.</p> <p>I can review my own opinions based on new scientific evidence.</p>	<p>Explain how well your conclusions match your evidence.</p> <p>Compare different explanations for the same observations and give reasons why one explanation is better than another.</p> <p>Explain the variables that affect the speed of diffusion of particles.</p> <p>Identify some effects of gas pressure.</p> <p>Explain how to classify difficult materials like foam and sand.</p> <p>Investigate the difficulties in recycling certain types of materials and why some materials cannot be recycled.</p> <p>Describe an example of a convention that scientists use when publishing their ideas.</p> <p>Compare the weather in an area and the expected types of weathering.</p> <p>Explain how fossils can be used to date rocks.</p> <p>Explain how fossils can be formed.</p>



<p>Advancing</p>	<p>I can suggest conclusions as a result of carrying out my inquiries.</p> <p>I can identify questions that can be investigated scientifically and suggest suitable methods of inquiry.</p> <p>I can use design communication methods to develop and present ideas, and respond to feedback.</p> <p>I can use a range of models to explain and make predictions.</p> <p>I can select relevant scientific knowledge from a range of evidence sources to evaluate claims presented as scientific facts.</p>	<p>Describe the arrangement and movement of particles in solids, liquids and gases.</p> <p>Outline predictions about materials that are explained using scientific knowledge.</p> <p>Explain observations using particle theory.</p> <p>Recall that materials are made out of particles and these cause their properties. These properties can be then linked to recycling processes.</p> <p>Describe the different ways in which grains can be transported.</p> <p>Explain how sediments are turned into rock.</p> <p>Explain why sedimentary rocks are often permeable.</p> <p>Explain how rocks are weathered by chemical and physical processes.</p> <p>Make simple statements about how sedimentary rocks were formed based on their texture.</p>
<p>Securing</p>	<p>I can explore and describe the properties of materials and justify their uses.</p> <p>I can explain how my data is used by services, which can help me make more informed decisions when using technology.</p> <p>I can effectively store and manipulate data to produce and give a visual form to useful information.</p> <p>I can identify questions that can be investigated scientifically and suggest suitable methods of inquiry.</p> <p>I can suggest conclusions as a result of carrying out my inquiries.</p> <p>I can evaluate methods to suggest improvements.</p>	<p>Identify images of solids, liquids and gases drawn according to the particle theory and how this links to the type of material and its density. This can then be used to investigate how they are processed for recycling.</p> <p>Recall that scientists publish their ideas.</p> <p>Measure volumes accurately.</p> <p>Recall that layers of deposited sediments turn into layers of sedimentary rocks.</p> <p>Identify whether rocks are permeable or impermeable.</p> <p>Recall that rocks are composed of grains of minerals.</p> <p>Recall the ways in which rocks are weathered.</p> <p>Identify the relationship between fragment size and water flow.</p> <p>Describe how rocks layers can be used to provide evidence for a sequence of events.</p>
<p>Beginning</p>	<p>I can explore the properties of materials and choose different materials for a particular use.</p> <p>I can recognise that changes in materials affect their properties and uses under different conditions.</p> <p>I can use my knowledge and understanding to predict effects as part of my scientific exploration.</p> <p>I can recognise patterns from my observations and investigations and can communicate my findings.</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>Recognise that different wastes have different properties and so need to be treated in different ways to be recycled.</p> <p>Recall some properties of some materials and sort materials into groups and how these link to how they are recycled.</p> <p>Classify materials as solid, liquid or gas.</p> <p>Sort rocks into groups based on texture.</p>



Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
<p>Local Flintshire has keen recycling initiatives and monitors recycling across the county.</p> <p>National Pupils are introduced to how we dispose of waste across the UK. Flintshire alone recycles 550 kg per person per year.</p> <p>https://myrecyclingwales.org.uk/local_authorities/flintshire</p> <p>International Pupils then go on to look at where these materials come from and how the water and rock cycle allow this to happen at an international level.</p>	<p>Numeracy</p> <ul style="list-style-type: none"> • Measurement using fine division instruments • Construction of accurate experimental drawings • Use of averages • Use of whole and decimal numbers • Construction of graphs using SALUTE as a guide <p>Literacy</p> <ul style="list-style-type: none"> • Describe and explain using connectives to structure reasoning • Focus on the command words for the description of processes • Extended writing formalising sentences and structuring paragraphs • Pupils use connectives to explain their reasoning • Summarise information • Use oracy skills to present and discuss information <p>Cross Curricular links: Geography This links with geography Year 8: Tectonics.</p>

Assessment (How will we know that students have learnt what we taught them?)	
<p>Formative assessment:</p> <ul style="list-style-type: none"> • Teacher circulating • Q&A discussions on various phenomenon and scientific understanding • Identify key terms to definitions/examples • Peer/self-assessment tasks • Group experimental work • Explanations of specific processes such as compaction and sedimentation. • Lesson tasks such as measuring angles precisely allows the use of whiteboards or tasks that feedback to the teacher to ensure pupils have learnt the desired process. 	<p>Summative assessment:</p> <ul style="list-style-type: none"> • Pupils will undertake a midpoint and end of topic test to assess their understanding and knowledge.

Evaluation (to be reviewed 2024)		
Strengths	Areas for Development	Pupil Voice