

KS3 Chemistry – Earth and its Atmosphere.

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| <p>Subject curriculum intent:</p> | <p>To develop in our students:</p> <ul style="list-style-type: none"> • An enjoyment of Science by providing relevant, interesting and challenging experiences and activities. • Observational skills, by looking for patterns and contrasts. • An inquiring mind and a logical approach to problem solving. • The ability to draw conclusions from simple experiments and, where appropriate, to devise suitable experiments for further investigations. • Communication skills in speaking and listening, written, diagrammatic and symbolic forms. • Co-operation and a respect for others by being able to work as part of a team – the development of appropriate social skills. • Confidence in their own abilities. • A respect for the environment and a careful use of resources. • An interest in the world about them and a greater understanding of it. | | |
| <p>End of KS3 intent/outcome</p> | <p>End of KS4 intent/outcome</p> | <p>End of KS5 intent/outcome</p> | |
| <p>Students will build on their knowledge of science through the different areas – biology chemistry and physics. Students will ‘work scientifically’ to achieve the goals of each topic area they encounter.</p> | <p>Students will continue to develop their scientific knowledge through the different areas – biology, chemistry and physics. Students will ‘work scientifically’ to achieve the goals of each topic area they encounter. Students will be able to relate their scientific experiences to everyday life and have an understanding that science is all around them.</p> | <p style="text-align: center;">N/A</p> | |
| <p>Intent for this topic:</p> | <p>In this module, students will look at the Earth’s structure and the features of the different layers. Students will learn how the climate is changing and how this is linked to carbon. Students will know about the carbon cycle and the different stages. Students will understand the implications of climate change and how recycling can help.</p> <p>Students will ‘work scientifically’ to achieve these goals, learning the key features of scientific enquiry; observing over time, pattern seeking, identifying, classifying, investigating (fair tests) and researching.</p> | | |
| <p>Core vocabulary needed for this subject/topic:</p> | <p>Subject: Biology, Chemistry, Physics Observe, pattern, identifying, classifying, investigating, fair test, researching</p> <p>Topic: Earth’s structure – crust, mantle and core. Tectonic plates – North American Plate, South American Plate, Eurasian Plate, African plate, Antarctic Plate Recycling – metals, coal, crude oil, gas (fossil fuels)</p> | | |

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| | Carbon cycle – photosynthesis, eating, respiration, decomposers, waste, fossil fuels, combustion Atmosphere, Climate, Carbon dioxide, nitrogen, oxygen, carbon dioxide. Fossil fuels, deforestation, global warming, radiation |
| Vocabulary pupils will have accessed in other topics or subject areas: | Earth, fossil fuels, global warming, gas, layers, structure, burning |
| Key vocabulary taught within this topic: | Earth’s structure – crust, mantle and core. Tectonic plates – North American Plate, South American Plate, Eurasian Plate, African plate, Antarctic Plate Recycling – metals, coal, crude oil, gas (fossil fuels) Carbon cycle – photosynthesis, eating, respiration, decomposers, waste, fossil fuels, combustion Atmosphere, Climate, Carbon dioxide, nitrogen, oxygen, carbon dioxide. Fossil fuels, deforestation, global warming, radiation |
| Big Questions | How is the Earth structured? What is the carbon cycle? How is the planet changing? |

Prior knowledge: what pupils may already have studied

| Key stage | Subject | Topic title | Term/year taught | Content/What might pupils already know? |
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| KS3 | Science | Space – Planets and Stars | Summer 2/year 3 | Pupils may be aware of the different planets in the solar system and their properties. |
| KS3 | Science | Why are plants important? | Autumn 1/year 3 | Pupils may have learnt about different parts, their parts and the life cycle of a plant. Pupils may have learnt about photosynthesis. |
| KS3 | Geography | Weather and Climate | Autumn 2/year 1 | Pupils may have looked at different weathers and how global warming impacts this. |
| KS3 | PSHE | Caring for the environment | Autumn 2/year 3 | Pupils may have looked at what harms the planet and ways they can help prevent this. |

Links to other subjects: Physics, Biology, PSHE, Geography

Equality, Diversity and Inclusion: Eunice Foote – a female climate scientist who predicted the effect of greenhouse gases before the man who gets the credit.

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| <p><u>Subject specific knowledge</u></p> | <p>Can identify the earth.</p> <p>Can explore different parts of the earth e.g. water, ground soil.</p> <p>Is able to build and explore layers of the earth.</p> <p>Can explore how the Earth's plates move in a practical task.</p> <p>Can explore what happens during an Earthquake in a practical task.</p> <p>Can explore how a volcano erupts through engaging with an experieent.</p> <p>Can recycle different items of rubbish into plastics, paper and cans.</p> | <p>Knows the Earth is made up of different layers.</p> <p>Can label the different parts of the Earth's structure using symbols.</p> <p>Can match definitions to each section of the Earth.</p> <p>Knows the Earth is split into different plates.</p> <p>Know that plates move differently.</p> <p>Knows links between tectonic plate movement and earthquakes and volcanoes.</p> <p>Know the Earth is the source of most of our resources e.g. metal, fossil fuels.</p> <p>Can recycle different items.</p> <p>Can give one reason for why we recycle.</p> <p>Knows that recycling can help the planet.</p> | <p>Can label the different layers of the Earth - the crust, core and mantle.</p> <p>Knows the difference between each layer of the Earth.</p> <p>Know what a tectonic plate is.</p> <p>Can label some of the tectonic plates.</p> <p>Knows how tectonic plates move.</p> <p>Knows that the movement between tectonic plates are linked to earthquakes and volcanoes.</p> <p>Can identify resources we get from the Earth - meatal, fossil fuels.</p> <p>Give 3 reasons why we recycle.</p> <p>Knows that recycling helps the planet.</p> <p>Can label each part of the carbon cycle using key words.</p> | <p>Can explain the difference between each layer of the Earth and explain their features.</p> <p>Can name some tectonic plates and explain their movements.</p> <p>Can explain how the movements of tectonic plates cause earthquakes and volcanoes.</p> <p>Can identify resources we get from the Earth - meatal, fossil fuels.</p> <p>Can explain how fossil fuels can harm the planet.</p> <p>Gives several reasons why we should recycle.</p> <p>Can label each part of the carbon cycle.</p> <p>Can use key words to explain the parts of the carbon cycle.</p> <p>Knows what climate is.</p> <p>Knows the names of the Earth's gases.</p> | <p>Knows the difference between the different layers of the Earth and explains the features.</p> <p>Can explain the properties of each layer of Earth.</p> <p>Can name the tectonic plates and locate them on a diagram.</p> <p>Can explain what tectonic plates are.</p> <p>Can explain the movements of tectonic plates and the implications of this.</p> <p>Explains how Earth resources are limited.</p> <p>Explains what fossil fuels are and how they harm the planet.</p> <p>Explain ways we can help the planet.</p> <p>Labels and explains each stage of the carbon cycle.</p> <p>Can explain how carbon dioxide affects the</p> |
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| | | <p>Can label each part of the carbon cycle using symbols.</p> <p>Can label the Earth's gases using symbols.</p> <p>Knows carbon dioxide level is increasing.</p> <p>Can identify reasons the carbon dioxide level is increasing.</p> <p>Knows the CO₂ level increasing is linked to fossil fuels.</p> | <p>Can order the stages of each part of the carbon cycle.</p> <p>Can explain what climate is.</p> <p>Knows the name of the gases in the Earth's atmosphere.</p> <p>Knows that the carbon dioxide level is increasing.</p> <p>Can give some reasons why the CO₂ levels are increasing - fossil fuels and deforestation.</p> | <p>Can explain why the carbon dioxide levels are increasing.</p> <p>Can explain global warming and link it to carbon dioxide increasing.</p> <p>Can identify some of the changes to the earth that are signs of global warming e.g. sea levels rising, rainfall patterns changing.</p> | <p>Earth's climate including global warming.</p> <p>Can draw diagrams to support their explanation.</p> |
| <u>Subject specific skills</u> | <p>Is able to participate in observations.</p> <p>Is able to follow a set of demonstrations to make models.</p> <p>Is able to follow a set of demonstrations to carry out a simple investigation.</p> | <p>Is able to research different scientists using the internet.</p> <p>Is able to label diagrams using symbols.</p> <p>Is able to make models following a picture method.</p> <p>Is able to label diagrams using symbols.</p> <p>Is able to make a prediction from a choice of 3 using symbols.</p> | <p>Is able to research different scientists using the internet.</p> <p>Is able to collate their research.</p> <p>Is able to label diagrams.</p> <p>Is able to make models following a word and picture method.</p> <p>Is able to link their model to a concept.</p> | <p>Is able to research different scientists using the internet.</p> <p>Is able to present their research to a member of staff or peer.</p> <p>Is able to make models following a written set of instructions.</p> <p>Is able to use their model to explain a concept.</p> | <p>Is able to research different scientists using the internet.</p> <p>Is able to present their findings to a group.</p> <p>Is able to draw and label diagrams.</p> <p>Is able to make models following a written set of instructions.</p> <p>Is able to suggest improvements to their model.</p> |

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| | | <p>Is able to follow a picture method to carry out a simple investigation.</p> <p>Is able to identify one thing that has changed when completing a fair test.</p> <p>Identifies the correct result in a table.</p> | <p>Is able to select an appropriate prediction from a given choice.</p> <p>Is able to follow a word and picture method to carry out a simple investigation.</p> <p>Is able to suggest what to change when completing a fair test.</p> <p>Is able to record results in a simple table.</p> <p>Analyses results in the form of tables, simple bar graphs and a brief descriptions using key words or sentence blanks.</p> | <p>Is beginning to draw and label diagrams.</p> <p>Is able to make a prediction linked to their investigation.</p> <p>Is able to follow a written set of instructions to carry out a simple investigation.</p> <p>Is able to explain why their investigation included a fair test.</p> <p>Is able to record results in a suitable table.</p> <p>Is able to record results in the form of a simple bar graph.</p> <p>Analyses results in the form of tables, simple bar graphs and a brief description.</p> | <p>Is able to use their model to explain a concept.</p> <p>Is able to use their model to explain a concept.</p> <p>Is able to make predictions.</p> <p>Is able to follow a written set of instructions to carry out a simple investigation.</p> <p>Is able to design an experiment to include a fair test.</p> <p>Is able to record results in a suitable table.</p> <p>Analyses results in the form of tables, simple bar graphs and a brief description.</p> <p>Is able to draw conclusions from their results.</p> |
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| <p><u>Suggested Activities</u></p> | <ul style="list-style-type: none"> • Label and explain the layers of the Earth's structure. • Identify the tectonic plates on a map. • Explore the movement of the tectonic plates and the impact this has on Earth. • Recycle different items of rubbish. |
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| | <ul style="list-style-type: none"> • Learn about fossil fuels. • Label and explain each stage of the carbon cycle. • Learn about the different gases that make up the Earth's atmosphere. • Climate change and the impact. • Draw and label diagrams. • Explore how we can help the planet. |
| <u>Possible Investigations/ Working Scientifically</u> | <ul style="list-style-type: none"> • Compare the Earth and its layers to food – e.g. scotch egg – and label the layers. • Make models of the Earth • Investigate global warming and how it changes things – e.g. ice melting and causing flooding. • Investigate earthquakes. • Research the effects of global warming and the planet. |
| <u>Personal development</u> | <p><u>Problem solving</u> Investigations and matching exercises</p> <p><u>Communication skills</u> Working as pairs in investigations, asking and answering questions</p> <p><u>Self-belief</u> Learning new skills, practising them and demonstrating them.</p> <p><u>Self-management</u> Working with new equipment</p> <p><u>Teamwork</u> Working as groups to solve problems or find out new information</p> |
| <u>Online resources</u> | |
| <p>Twinkl CLEAPPS for risk assessments BBC bitesize for video resources Youtube Resource folder on the school server</p> | |
| <u>Evidencing Work</u> | |
| <p>All work / evidence sheets need to be printed off (where appropriate levelled in accordance with the rubric), students need to self-assess and work needs to be put in student folders.</p> | |

RRS Articles:

This unit of work is linked to Articles of the UN Convention on the Rights of the Child.

Article 13 (freedom of expression)

Article 24 (health and health services)

Article 29 (goals of education)