



Science Year 8 Long Term Map

Subject Intent/Aims

Expose all students to a broad range of learning opportunities to deepen their knowledge and understanding of themselves and the world around them and to build a solid foundation of Science knowledge and skills. We believe in developing curiosity and understand that science is an active process with many questions to be answered and still to be asked. We provide an understanding of how knowledge was derived, discovered and came to be accepted by the scientific community. By focusing on thinking, interpreting and evaluating rather than simply memorising scientific fact we intend to enable our students to use the skills that they need to answer their own scientific questions.

Our focus on the scientific process as a way of thinking and working will allow our students to develop their own ideas, attitudes and interpretations.

Autumn 1

Autumn 2

Spring 1

Spring 2

Summer 1

Summer
2

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335174/SECONDARY_national_curriculum_-_Science_220714.pdf

Composite: Understand the process of weathering and how rocks can change their formation through the rock cycle.

Component 1:

- ☐ **Know** what the term porous means.
- ☐ **Know** examples of porous and non-porous rocks.
- ☐ **Know** rock samples and test them for their porosity

Component 2 :

- ☐ **Know** some names of sedimentary rocks, metamorphic rocks and igneous rocks
- ☐ **Know** a sedimentary rock, metamorphic and igneous rock from its features
- ☐ **Know** how sedimentary rocks, metamorphic and igneous rocks are made,

Component 3:

- ☐ **Know** that weathering is the wearing away of rocks and breaks it down into smaller bits.
- ☐ **Know** the 3 different types of weathering.
- ☐ **Know** how the various types of weathering break down rocks.

Component 4:

- ☐ Know that volcanoes are the

Composite: Understand how the body digests food to obtain nutrient.

Component 1:

- Know how we carry out mechanical and chemical digestion

Component 2:

- Know how the digestive system is adapted to break down and absorb nutrients.

Component 3:

- Know how enzymes work and how they help break down food

Component 4:

Know the importance of digestion and why it is linked with health.

Component 1:

- Know the role of each nutrient to the body
- Interpret nutritional information on packaging.
- Know the importance of a balanced diet

Component 2:

- Know how to test for starch and reducing sugars

Composite : Understand the Principles of Electricity

Component 1:

- ☐ Know how static electricity is produced.
- ☐ Know how charged objects interact
- ☐ Know what is meant by an electric field.

Component 2:

- ☐ Know the circuit symbols
- ☐ Know how to construct a simple series and parallel circuit
- ☐ Know what is meant by current.
- ☐ Know how to measure current
- ☐ Know how current travels in a series and parallel circuit.

Component 4:

- ☐ Know what is meant by potential difference
- ☐ Know how to measure potential difference

- ☐ Know what is meant by the rating of a battery or bulb.

Component 5:

- ☐ Know the difference between a series and parallel circuit and how current and voltage vary

Composite : Understand the process of gas exchange and how respiration occurs

Component 1:

- Know how our body is organised and is adapted to carry out gas exchange
- Know how gas exchange takes place within the lung
- Know how the lungs are adapted to carry out gas exchange
- Know the damaging effects of carbon monoxide and tar when smoking
- Know the effects of alcohol on health and behaviour

Component 2:

- Know aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
- Know how to represent aerobic respiration using the word equation
- Know the process of anaerobic respiration in humans and micro-organisms, including

Composite : Understand how chemical reactions between elements in the periodic table are carried out in everyday life.

Component 1:

- Know the properties of Metals

Component 2:

- Know how chemical reactions take place between elements

Component 3:

- Know how we can represent chemical reactions using word and symbol equations

Component 4:

- Know how metals react with oxygen
- Know how metals react with water

Component 5:

- Know how mass is conserved in a reaction.

Component 6:

- Know how endo and exothermic reactions occur

Composite: Understand how energy travels as waves and how waves are used to produce light

Component 1: C

- Know how sources of light are non-luminous and luminous
- Know how light travels through different objects

Component 2:

- Know how light reflects off different surfaces
- Measure the angle of incidence and angle of reflection

Component 3:

- Know how light refracts through different mediums and how this is measured.

☐

Component 4:

- Know that white light is made up of a spectrum of colours and how these colours disperse through a glass prism

Component 5:



<p>source of igneous rocks.</p> <p>☐ Know the cross section of a volcano.</p> <p>☐ Know how volcanoes are formed</p> <p>Component 5: Know stages of the carbon cycle.</p> <p><u>Composite: Understand the properties of elements in the periodic table.</u></p> <p>Component 1:</p> <p>☐ Know how elements are organised in the periodic table according to their properties</p> <p>☐ Know how the periodic table was developed</p> <p>Component 2:</p> <p>☐ Know that elements are metals and non-metals which have different properties.</p> <p>Component 3:</p> <p>☐ Know why elements are grouped according to their properties</p> <p>☐ Know how the groups look at reactivity (group 1, 7 and 0)</p> <p>☐</p>	<ul style="list-style-type: none"> Know a positive result for each food test <p>Component 3:</p> <ul style="list-style-type: none"> Know the effects of calorie intake and exercise Know and explain the health issues caused by an unhealthy diet / being overweight <p><u>Composite: Understand how energy travels as waves and how waves are used to produce sound</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Know that waves come as longitudinal and transverse waves Know examples of longitudinal and transverse waves such as sound and light. <p>Component 2:</p> <ul style="list-style-type: none"> Know how sound travels and Know pitch and loudness. Know how sound waves enter the ear and how a change in frequency affects pitch. 	<p>Component 6:</p> <p>☐ Know what is meant by resistance</p> <p>☐ Know how to calculate resistance</p> <p>Know the difference between conductors and insulators in terms of resistance.</p> <p>Component 1:</p> <p>☐ Know the power of electrical appliances</p> <p><u>Composite: Understand how speed is measured and how this affects motion.</u></p> <p>Component 1:</p> <p>☐ Know how to calculate speed.</p> <p>☐ Know the units needed for speed.</p> <p>☐ Know the difference between speed and velocity.</p> <p>☐ Know relative motion</p> <p>Component 2:</p> <p>☐ Interpret distance-time graphs.</p> <p>☐ Know the motion of an object using a distance-time graph.</p> <p>☐ Know how to calculate speed using a distance-time graph</p> <p>Component 3:</p> <ul style="list-style-type: none"> Know Hooke's Law and apply it to how objects are squashed and stretched <p>Component 4:</p> <p>☐ Know what gas pressure is and give examples of where it can be seen.</p> <p>☐ Know the factors that effect gas pressure.</p> <p>☐ Know how atmospheric pressure changes with altitude</p> <p>Component 5:</p> <p>☐ Know what liquid pressure is.</p> <p>☐ Know the factors that affect liquid pressure.</p>	<p>fermentation, and a word summary for anaerobic respiration</p> <ul style="list-style-type: none"> Know the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism. <p><u>Composite: Understand the process of photosynthesis and how substances are moved in a plant</u></p> <p>Component 1:</p> <p>Know the structure and functions of parts of a plant</p> <p>Component 2:</p> <ul style="list-style-type: none"> know how to test a leaf for starch Know the substances involved in photosynthesis Know the reactants in, and products of, photosynthesis, and a word summary for photosynthesis <p>Component 3:</p> <ul style="list-style-type: none"> Know how the structure of leaves allows gases in and out of them <p>Component 4:</p> <ul style="list-style-type: none"> Know the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere 	<p><u>Composite: Understand the theory of evolution through natural selection and how characteristics can be inherited</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Know the differences between species Know the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation Know the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection <p>Component 2:</p> <ul style="list-style-type: none"> Know the changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction <p>Component 3:</p> <ul style="list-style-type: none"> Know the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. <p>Component 4:</p> <ul style="list-style-type: none"> Know what chromosomes and genes are Know why our genes control what we look like Know how gender is determined Know heredity as the process by which genetic information is transmitted from one generation to the next <p>Component 5:</p> <ul style="list-style-type: none"> Know the simple model of 	<ul style="list-style-type: none"> Know the primary and secondary colours and how these are shown using filters Know how colours are absorbed using different filters <p><u>Composite: Understand how forces act on the planets within the solar system and how we get seasons and day/night</u></p> <p>Component 1 :</p> <ul style="list-style-type: none"> Know gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only) <p>Component 2:</p> <ul style="list-style-type: none"> Know our Sun as a star, other stars in our galaxy, other galaxies <p>Component 3:</p> <ul style="list-style-type: none"> Know the seasons and the Earth's tilt, day length at different times of year, in different hemispheres <p>Component 4</p> <ul style="list-style-type: none"> Know the light year as a unit of astronomical distance <p>Component 5</p> <p>Know the conditions needed to support life and describe why other planets do not support life</p>
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				<div>🔍 Know why some objects float and sink</div> <div>Component 6:</div> <div>🔍 Know what pressure is</div> <div>🔍 Know how to calculate pressure.</div> <div>🔍 Understand how pressure affects different situations.</div>				chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model			
Higher Order Knowledge		Higher Order Knowledge		Higher Order Knowledge		Higher Order Knowledge		Higher Order Knowledge		Higher Order Knowledge	
Rocks interpret models and discuss their limitations		Digestion explain the adaptations of organs and how these maximise efficiency in the system		Electricity rearrange formulae to be able to calculate the subject of a quantitative question		Respiration write balanced chemical equations for photosynthesis and aerobic and anaerobic respiration		chemical reactions write balanced symbol equations for the reactions used		Light explain why objects appear different colours depending on their perceived surface colour and the colour of the light and/or filter	
Periodic table explain the order of reactivity within Periodic groups		Waves research and present uses of ultrasonic waves		Forces Problem solve different scenarios to ensure safe working practices when pressure is a potential issue		Photosynthesis evaluate the process used for the investigation and suggest how improvements could be made and their effect		IVE produce a balanced argument based on evidence to suggest who should have got the Nobel Prize		Space create a plan for a biome to enable humans to live sustainably on Mars	
<u>Key terms</u>		<u>Key terms</u>		<u>Key terms</u>		<u>Key terms</u>		<u>Key terms</u>		<u>Key terms</u>	
The Earth Crust Mantle Core, Outer Core Inner, Core, Atmosphere, Troposphere Uplift Respiration, Combustion, Photosynthesis, Dissolving, Carbon Cycle, Carbon Store, Climate Change, Deforestation, Radiation greenhouse Effect, greenhouse Gases/ Global warming Sedimentary, igneous,	Periodic Table Metals, non-metals, groups, periods, properties, compounds, reaction, chemical, reactivity	Digestion Mouth, oesophagus, gullet, stomach, enzymes, small intestine, large intestine, saliva, bile, surface area	Sound Sound, transverse, longitudinal, frequency, wavelength, pitch, loudness, energy, particles, reflection, refraction, vibrations,	Electricity Electricity, electrons, series, parallel, voltage, current, power, resistance, ammeter, voltmeter	Speed and Motion Speed, Distance, Time, Metres, Motion, Relative, Pressure, Newton, Upthrust, Molecules, Particles, Collide, Surface, Flow, Compress, Force, Area, Solid, Liquid, Gas,	Gas exchange Particles, diffusion, concentration, adaptations, exchange, oxygen, carbon dioxide.	Photosynthesis: organ, adaptation, iodine, starch, glucose, stomata, guard cells, transpiration	Chemical reactions Exothermic , endothermic, atoms, chemical, thermal decomposition, conservation, combustion, chemical formulae	Evolution: Darwin, Fossilisation, adaptation, traits, biodiversity, variation, characteristics, extinction Inheritance, , genes, Chromosomes, DNA, Double helix Alleles, Bases	Space Planets, gravity, mass , night, day, axis, seasons, forces, newtons	Light Wavelength, spectrum, dispersion, prism, colour, refraction, absorption



Metamorphic, Porous, Weathering, Sediment, Physical Weathering Freeze-Thaw Chemical Weathering Biological Weathering, erosion, transport, deposition, Compaction, Cementation											
Final Composition/Deliberate Practice				Final Composition/Deliberate Practice				Final Composition/Deliberate Practice			
Term 1		Term 2		Term 1		Term 2		Term 1		Term 2	
Earth construct a model to show the rock cycle Periodic Table elements research		Digestion journey of a cheese sandwich Sound Ghostbusters work		Electricity build circuits from diagrams and measure current and pd Forces and motion pressure Badger task		Respiration makea model lung and label the organs and their functions Photosynthesis Badger task		Chemical reactions use equipment safely to carry out experiment and gather meaningful results IVE use the rules of genetics to devise a new species		Light colouring sheets Space Biome creation	
Summative/Formative assessment				Summative/Formative assessment				Summative/Formative assessment			
End of unit tests (earth and periodic table)will marked with personalised feedback RRR Core questions to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student.		End of unit tests (digestion and sound) will marked with personalised feedback RRR Core questions to recall prior knowledgewill be tested at the beginning of each lesson and self-assessed by the student.		End of unit tests (electricity and forces) will marked with personalised feedback RRR Core questions to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student.		End of unit tests (respiration and photosynthesis)will marked withpersonalised feedback RRR Core questions to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student.		End of unit tests (chemical reactions and IVE) will marked withpersonalised feedback RRR Core questions to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student.		End of unit tests(light and Space) will marked with personalised feedback RRR Core questions to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. point end of year exam to assess y7 and y8 topics	
Numeracy and literacy		Numeracy and literacy		Numeracy and literacy		Numeracy and literacy		Numeracy and literacy		Numeracy and literacy	



Maths skills – graphs, calculations English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,
Cross curricular links	Cross curricular links	Cross curricular links	Cross curricular links	Cross curricular links	Cross curricular links
Earth: geography weathering and volcanoes Art modelling and scale drawing Periodic table: history- Victorians	Digestion: PE diet and exercise Food Tech food and nutrients Sound: Music specific terms MFL link to musical terms Engineering non destructive testing of materials	Electricity: Art interpretation of circuits Forces: engineering structures and integrity	Respiration: PE health and fitness, recovery time Photosynthesis: Gardening club conditions for growth	Chemical reactions: PE use of icepacks IVE: History of modern medicine RE ethics of genetic engineering	Light: Art mixing of pigments CS coding signals Space: RE persecution of scientists Geography composition of atmospheres
SMSC		British Value		RSHE	
<p><i>There will be multiple opportunities for students develop spiritually; being creative in their learning and a range of activities</i></p> <p><i>The high expectations placed on the student from the school and department mean that pupils will regularly be made aware of the right and wrong morally</i></p> <p><i>Pupils are expected to share the views morally on the different topics but also show respect and appreciate others in the classroom.</i></p> <p><i>The majority of topics will give the students opportunity to develop their social skills, from giving presentations to working in group tasks.</i></p>		<p><i>Students will be taught the legal implications of using the internet</i></p> <p><i>Students will be taught to fully appreciate other students viewpoints and the importance of being respectful</i></p> <p><i>Students will be taught the importance of selecting valid information from reliable sources for any presentation tasks that they do.</i></p> <p><i>Students are taught how to contribute to life in modern Britain by learning about the history of scientific discovery</i></p> <p><i>Students will learn how to display British Values to use the internet</i></p>		<p><i>The students will be taught about how to be safe online and the dangers.</i></p> <p><i>The students will be made aware of online relationships and the sexual issues that may arise.</i></p> <p><i>The students will be regularly conversed on their physical and mental health when issues arise within topics</i></p> <p><i>They will be taught about the need for tolerance of other people's viewpoints</i></p>	

Adapted Curriculum Content Weathering restricted to practice but some groups could look at chemical equation	Adapted Curriculum Content Diffusion model for top set only in detail Rearrangement of wave equation based on mathematical ability of individuals in the group	Adapted Curriculum Content Rearrangement of equations not necessary for lower groups Also numbers for calculations to be considered. Some individuals could use mixed units	Adapted Curriculum Content Word equations or chemical equations as appropriate. Limit explanation in detail of diffusion	Adapted Curriculum Content Word equations or chemical equations as appropriate Use of punnet diagrams with more able/time permitting	Adapted Curriculum Content Solar system models to be included for more able. Different sheets for colour absorption and reflection as appropriate Preprinted sheets to avoid use of protractor
<u>Adaptive Implementation Practices:</u> Coloured paper/pens Differentiated worksheets	<u>Adaptive Implementation Practices:</u> Coloured paper/pens Differentiated worksheets	<u>Adaptive Implementation Practices:</u> Coloured paper/pens Differentiated worksheets Differentiated tasks	<u>Adaptive Implementation Practices:</u> Coloured paper/pens Differentiated worksheets Differentiated tasks	<u>Adaptive Implementation Practices:</u> Coloured paper/pens Differentiated worksheets Differentiated tasks	<u>Adaptive Implementation Practices:</u> Coloured paper/pens Differentiated worksheets Differentiated tasks



<p>Differentiated tasks Seating plans to maximise concentration allowing for visual/hearing impairments etc Appropriate use of IWB Dual coding Spare equipment Modelling experimental detail Pre drawn tables/graphs/diagrams to be labelled</p>	<p>Differentiated tasks Seating plans to maximise concentration allowing for visual/hearing impairments etc Appropriate use of IWB Dual coding Spare equipment Modelling experimental detail Pre drawn tables/graphs/diagrams to be labelled</p>	<p>Seating plans to maximise concentration allowing for visual/hearing impairments etc Appropriate use of IWB Dual coding Spare equipment Modelling experimental detail Pre drawn tables/graphs/diagrams to be labelled</p>	<p>Seating plans to maximise concentration allowing for visual/hearing impairments etc Appropriate use of IWB Dual coding Spare equipment Modelling experimental detail Pre drawn tables/graphs/diagrams to be labelled</p>	<p>Seating plans to maximise concentration allowing for visual/hearing impairments etc Appropriate use of IWB Dual coding Spare equipment Modelling experimental detail Pre drawn tables/graphs/diagrams to be labelled</p>	<p>Seating plans to maximise concentration allowing for visual/hearing impairments etc Appropriate use of IWB Dual coding Spare equipment Modelling experimental detail Pre drawn tables/graphs/diagrams to be labelled</p>
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St Philip Howard Catholic Voluntary Academy



Department Planning 2024



St Ralph
Sherwin
Catholic Multi Academy Trust



ST. PHILIP HOWARD
CATHOLIC VOLUNTARY ACADEMY



St Philip Howard Catholic Voluntary Academy



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