



Science Year 7 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 Safety and Skills required for working Practically in Science:

Component 1:

- Know how to stay safe in science
- Know the use for different types of lab equipment
- Know how to use a Bunsen burner
- Know how to read scales and take measurements

Component 2:

- Know when results are accurate or precise
- Know how to identify and control risks in a lab
- Know how variables are used in scientific investigations
- Know how to present data in bar graphs and line graphs

Component 3:

- Know how to plan an investigation

Composite: Understand the uses of acids and alkalis in real life applications.

Component 1:

- Know the concentration of solutions
- Know what the pH scale shows
- Know how to identify acidic and alkaline solutions

Component 2:

Composite: Understand how the world around is made up of matter

Component 1:

- Know how particles make up everything around us
- Know how particles can be arranged to form a solid, liquid and gas.
- Know the differences and similarities between solids, liquids and gases

Component 2:

- Know if you give particles enough energy you can change their state

Component 3:

- Know and explain how solids melt into a liquid
- Know and explain how a liquid evaporates into a gas
- Know and explain how a gas turns back into a liquid
- Know how some substances can change from a solid to a gas

Component 4:

- Know the difference between a physical and chemical change.

Composite: Understand how Energy is stored and how it is transferred

Component 1:

- Know how energy is stored in food and fuels and give examples of energy transformations
- Know other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels

Component 2:

- Know the differences between non-renewable and renewable energy and how electricity is produced using some of these energy types

Component 3:

- Know the difference between heat and temperature

Component 4:

- Know ways of reducing unwanted energy transfers
- Know how energy transfers by conduction
- Know how energy transfers by convection.
- Know how energy transfers by radiation

Ecosystems Composite: Understand the life processes and how they are carried out in the environment around us.

Component 1:

- know that food chains and webs show the transfer of energy
- **Component 2:** Know how an increase or decrease in population of a species or introduction of an invasive species affects the food web

- **Component 3:** know that energy transfer can be shown with a pyramid of numbers and a pyramid of biomass

Composite: Understand that everything is made from atoms and how they react around us to make compounds

- **Component 1:** Know an element is made from one type of atom

- Know what makes up an atom

Component 2:

- Know that elements are split into metals and non-metals

Component 3:

- Know how these atoms can chemically join together to form compounds.

Composite: Understand the changes that occur in our body and how we create human life

Component 1:

- Know the process of Puberty
- State the changes that occur during Puberty

Component 2:

- Know the functions of the different parts of the reproductive systems
- Know what fertilisation is
- Label a diagram of a sperm and egg cell
- Explain, using keywords, the different stages of fertilisation.
- Know fertilisation, implantation, ejaculation and ovulation
- Know the functions of the different structures involved in pregnancy.
- Know how the baby develops.

Component 3:

- Know how hormones control the menstrual cycle

Component 4:

- Describe the different plant reproductive structures
- Explain how plant reproduction happens
- Compare and contrast human and plant reproduction

Composite: Understand how substances that exist in nature can be pure/impure and how we can separate out components of a mixture.

Component 1:

- Know that substances can exist as pure or impure.

Component 2:

- Know the processes that can separate out mixtures

Component 3:

- Know how filtration, evaporation, chromatography and distillation can be used to separate these mixtures

Composite: Understand how magnetic forces can induce an electrical current

Component 1:

- Know the power of electrical appliances
- Know magnetism and magnetic forces

Component 2:

- Know how a compass works and how magnetic field lines are formed around a magnet
- Know what a solenoid is
- Know what an Electromagnet is and how you can increase the strength of an electromagnet

Component 3:

- Uses of electromagnets



<ul style="list-style-type: none"> Know the uses of acids Know the uses of alkalis Know neutralisation reactions Component 3: <ul style="list-style-type: none"> Know which antacid tablet is the most effective at neutralizing acid 	<p><u>Composite: Understand the cell structure and function of living organisms</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Know how the body is organised Know how microscopy techniques have developed over time Know the structure of animal and plant cells <p>Component 2:</p> <ul style="list-style-type: none"> Know how cells become specialised in both animal and plant cells Know how cells divide to produce organs which are part of organ systems <p>Component 3: Know what a unicellular organism is</p> <ul style="list-style-type: none"> Know the structure of an amoeba vs a euglena <p>Component 4: Know how and why substances move in and out of cells</p> <p>Component 5:</p> <ul style="list-style-type: none"> Know the process of diffusion and how and where it takes place i.e. gas exchange in the lungs <p><u>Composite: Understand how the skeletal system and muscles work together to help protect organs and allow us to move.</u></p> <ul style="list-style-type: none"> Know the function of the major muscle groups Know the term antagonistic and give examples of pairs Know the structure of the skeleton Know the functions of the skeleton Know the terms ligament, tendon and joint 	<p><u>Composite: Know the Fundamentals of Force and Motion</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Know what scalar and vector quantities are Know what happens to motion when forces are balanced and unbalanced Know Hooke's Law and apply it to how objects are squashed and stretched <p>Component 2:</p> <ul style="list-style-type: none"> Know the difference between mass and weight and gravity <p>Component 3:</p> <ul style="list-style-type: none"> Know the difference between contact and non-contact forces Know how friction and air resistance affect an object. <p>Component 4:</p> <ul style="list-style-type: none"> Know what is meant by a moment. Complete practical worksafely to collect data. Know how to calculate the moment of a force. 	<p><u>Composite: Understand the properties of elements in the periodic table.</u></p> <p>Component 1:</p> <ul style="list-style-type: none"> Know how elements are organised in the periodic table according to their properties Know how the periodic table was developed <p>Component 2:</p> <ul style="list-style-type: none"> Know that elements are metals and non-metals which have different properties. <p>Component 3:</p> <ul style="list-style-type: none"> Know why elements are grouped according to their properties Know how the groups look at reactivity (group 1, 7 and 0) 		
Higher Order Knowledge	Higher Order Knowledge	Higher Order Knowledge	Higher Order Knowledge	Higher Order Knowledge	Higher Order Knowledge
Evaluate the method used in the investigation	Evaluate the method used in the investigation Research the uses of prosthetics	Compare energy resources against a range of parameters	Research a habitat and present findings Construct a timeline showing historical developments	Compare and contrast human and plant reproduction	Research and write a biography of one of the scientists involved in the development of electricity and electromagnetism



Key terms		Key terms		Key terms		Key terms		Key terms		Key terms	
Practical skills Independent variable, Dependent variable, Control variable, Hypothesis, Accuracy, Precision	Acids and Alkalis Acid Alkali Base Solution Neutralisation pH scale Salts	particles Particles, energy, bonds, vibrate, melting, freezing, condensing sublimation Cells Cells, Tissue, Organ, Microscope, cell membrane, cell wall, vacuole, nucleus, chloroplast, magnify, specimen. Cell division, photosynthesis Diffusion specialised cells Tissue, Organ, red blood cells, sperm cell, egg cell, palisade cell Amoeba, euglena, multicellular, unicellular, adaptations	Skeletal and muscular systems Bones, protection, support, movement, muscles, ligaments, tendons	Energy Energy, transformations, wasted, electricity, thermal, sound, temperature, fossil fuels	Forces and motion Vectors, Scalars, balanced, unbalanced, newton, elasticity, air resistance, friction, mass, gravity, weight	ecology Adaptation, Biodiversity, Community, Competition Habitat Ecosystem Environment Niche Organism Species Variation	Atoms, elements and compounds Atoms, Elements, Compounds, Mixture, Properties, Physical, Chemical	Reproduction Puberty Fertilisation Reproduction Fertilisation Ovulation Menstrual Genes Chromosomes Implantation Gametes		Magnetism Electromagnets, magnetic field, Solenoid Attract repel	Pure and impure Particles, mixtures, properties, impure, pure, filtration, evaporation, chromatography and distillation, Solute, Solvent, Solution, Dissolve, Soluble, insoluble, filtration, chromatography, distillation, fractional distillation, saturated, evaporation
Deliberate Practice/Final composition											



Term 1	Term 2	Term 1	Term 2	Term 1	Term 2
Plan and carry out investigations as designed by the teacher	Make a labelled model of a specialized cell	Badger task: forces acting on a pram Analyse energy transfers in a system	Badger task: food web Make a model atom	Badger task: journey of a sperm cell Dissection of a flower	Badger task: electromagnet in use Undertake a separation puzzle
Summative/Formative assessment		Summative/Formative assessment		Summative/Formative assessment	
Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. Century nuggets End of unit assessments (skills and acids and alkalis) will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. Century nuggets End of unit assessments (cells and muscles) will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. Century nuggets End of unit assessments (energy resources and forces and motion) will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. Century nuggets End of unit assessments (ecosystems and the Periodic table) will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. Century nuggets End of unit assessments (reproduction) will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self-assessed by the student. Century nuggets End of unit assessments (pure and impure and magnets) will be marked with personalised feedback End of year assessment will test recall and application of synoptic content
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
Technology health and safety	Art modelling and drawing accurately Engineering pressure and forces in structures	Geography renewable and non renewable energy sources	Geography habitats and climate History the development of the model of the atom and the Periodic Table	PSHE adolescence RE reproduction	Technology uses of magnets and types of material
SMSC		British Value		RSHE	



<p><i>There will be multiple opportunities for students develop spiritually; being creative in their learning with the different activities they are asked to undertake</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</i></p> <p><i>Pupils are expected to share their views morally on the different topics but also show respect and appreciate others in the classroom.</i></p> <p><i>The topics will give the students opportunity to develop their social skills, from presenting work to collaborating 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 when sharing ideas</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 progress</i></p> <p><i>Students will learn how to display British Values when working together in science lessons</i></p>	<p><i>The students will be taught about how to be safe online</i></p> <p><i>The students will be made aware of relationships and the sexual issues that may arise.</i></p> <p><i>The students will be taught about adolescence and signposted to services to help them deal with it as appropriate</i></p> <p><i>The students will be taught about sexual reproduction with consideration for Catholic values</i></p>
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<p><u>Adapted Curriculum Content:</u></p> <p>All pupils are expected to cover all of the aspects of the introductory topic</p> <p>Choice of experiments in acids topic depending on ability of class</p>	<p><u>Adapted Curriculum Content:</u></p> <p>May be necessary to just focus on water for the changes of state</p> <p>Cell model homework may be omitted and done as a class activity instead</p>	<p><u>Adapted Curriculum Content:</u></p> <p>More able pupils may be taught systems involving multiple stages with several energy transfers and discuss wasted energy</p> <p>Forces can be restricted to one pair per example</p> <p>Moments can be omitted for lower ability</p>	<p><u>Adapted Curriculum Content:</u></p> <p>Some groups will look at food webs as well as food chains. It may be appropriate to introduce quadrats to some classes</p> <p>Nomenclature of compounds may need to be limited to binary compounds</p>	<p><u>Adapted Curriculum Content:</u></p> <p>All pupils are expected to learn all of the components</p>	<p><u>Adapted Curriculum Content:</u></p> <p>Some of the separation techniques, eg distillation could be demonstrated if necessary.</p> <p>Limit chromatography to 3 colours and leave out an unknown</p> <p>Current flow and force field direction for higher ability only</p>
<p><u>Adaptive Implementation Practices:</u></p> <p>Coloured paper/pens</p> <p>Differentiated worksheets</p> <p>Differentiated tasks</p> <p>Seating plans to maximise concentration allowing for visual/hearing impairments etc</p> <p>Appropriate use of IWB</p> <p>Dual coding</p> <p>Spare equipment</p> <p>Modelling experimental detail</p> <p>Pre drawn tables/graphs/diagrams to be labelled</p>	<p><u>Adaptive Implementation Practices:</u></p> <p>Coloured paper/pens</p> <p>Differentiated worksheets</p> <p>Differentiated tasks</p> <p>Seating plans to maximise concentration allowing for visual/hearing impairments etc</p> <p>Appropriate use of IWB</p> <p>Dual coding</p> <p>Spare equipment</p> <p>Modelling experimental detail</p> <p>Pre drawn tables/graphs/diagrams to be labelled</p>	<p><u>Adaptive Implementation Practices:</u></p> <p>Coloured paper/pens</p> <p>Differentiated worksheets</p> <p>Differentiated tasks</p> <p>Seating plans to maximise concentration allowing for visual/hearing impairments etc</p> <p>Appropriate use of IWB</p> <p>Dual coding</p> <p>Spare equipment</p> <p>Modelling experimental detail</p> <p>Pre drawn tables/graphs/diagrams to be labelled</p>	<p><u>Adaptive Implementation Practices:</u></p> <p>Coloured paper/pens</p> <p>Differentiated worksheets</p> <p>Differentiated tasks</p> <p>Seating plans to maximise concentration allowing for visual/hearing impairments etc</p> <p>Appropriate use of IWB</p> <p>Dual coding</p> <p>Spare equipment</p> <p>Modelling experimental detail</p> <p>Pre drawn tables/graphs/diagrams to be labelled</p>	<p><u>Adaptive Implementation Practices:</u></p> <p>Coloured paper/pens</p> <p>Differentiated worksheets</p> <p>Differentiated tasks</p> <p>Seating plans to maximise concentration allowing for visual/hearing impairments etc</p> <p>Appropriate use of IWB</p> <p>Dual coding</p> <p>Spare equipment</p> <p>Modelling experimental detail</p> <p>Pre drawn tables/graphs/diagrams to be labelled</p>	<p><u>Adaptive Implementation Practices:</u></p> <p>Coloured paper/pens</p> <p>Differentiated worksheets</p> <p>Differentiated tasks</p> <p>Seating plans to maximise concentration allowing for visual/hearing impairments etc</p> <p>Appropriate use of IWB</p> <p>Dual coding</p> <p>Spare equipment</p> <p>Modelling experimental detail</p> <p>Pre drawn tables/graphs/diagrams to be labelled</p>



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St Philip Howard Catholic Voluntary Academy



Department Planning 2024



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