

Programme of Learning – Overview

Key Stage 3 Science			
Year title / big question:	An introduction to the fundamentals of science		Year group: 7
Autumn Term 1 title: Solids, liquids and Gases Cells	Spring Term 1 title: Reactions Energy	Summer Term 1 title: Breathing and respiration Acids and Alkalis Sound	
Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	
To explore the particle model and to apply this to changes that take place during melting, freezing, boiling, evaporating, sublimation and condensing. To explore the structure, function and adaptations of animal, plant and bacterial cells, as well as the main structural differences between them. To explore how cells form tissues, organs, and systems in multicellular organisms. To describe the process of diffusion across cells and the factors that affect this process.	To explore the Periodic Table of the elements, and the differences between elements, compounds and mixtures. To explore what happens to atoms in chemical reactions, with a focus on oxidation. To explore energy stores and transfers. To apply understanding of energy stores and transfers to calculations of efficiency and power. To explore the cost of electricity in the home.	To explore the process of anaerobic respiration in a range of organisms and describe how this is different to aerobic respiration. To explore the difference and identification of acids and alkalis, and to describe the reaction that takes place when these two types of chemicals react. To explore neutralisation reactions that take place when antacids are used for indigestion. To explore the different types of waves (longitudinal and transverse), as well as their features.	
Summative assessment:	Summative assessment:	Summative assessment:	
C1 Knowledge and working scientifically assessment.	C2 Knowledge and working scientifically assessment.	B2 Knowledge and working scientifically assessment. C3 Knowledge and working scientifically assessment. End of Year 7 Assessment	
Autumn Term 2 title: Cells Forces	Spring Term 2 title: Energy Breathing and Respiration	Summer Term 2 title: Sound Animal Reproduction	
Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	

To explore the skeletal and muscular system and how that is adapted in humans. To explore forces in action with a focus on the difference between force pairs and balanced/unbalance forces. To explore gravity as the force that pulls us to the centre of the Earth and how we can use gravitational field strength to calculate weight. To apply understanding of forces to speed, distance time graphs, friction, squashing and stretching. To explore energy stores and transfers.	To explore energy resources used by humans in everyday life to describe the difference between finite and renewable resources. To explore the process of aerobic respiration. To explore the process of gas exchange in the mammalian lungs, and how these organs are adapted for the process. To explore how breathing changes with exercise and apply knowledge/understanding to explain why these changes take place,	To explore how humans hear sounds waves. To explore the difference between amplitude and frequency. To apply knowledge of sounds waves to calculating the speed of sound, microphones and loudspeakers. To explore adolescence with a focus on the organs and adaptations of the male and female reproductive systems. To explore in detail the female reproductive system and how it is adapted by means of the menstrual cycle, fertilisation, implantation, developing foetus and birth. To explore how humans can lead of healthy lifestyle with a focus on diet, the digestive system, and drugs.
Summative assessment:	Summative assessment:	Summative assessment:
B1 Knowledge and working scientifically assessment. P1 Knowledge and working scientifically assessment. Milestone assessment	P2 Knowledge and working scientifically assessment.	P3 Knowledge and working scientifically assessment. B3 Knowledge and working scientifically assessment.

Programme of Learning – Overview

Key Stage 3 Science			
Year title / big question:	Application of the fundamentals of science		Year group: 8
Autumn Term 1 title: Lifestyle Separating techniques	Spring Term 1 title: Photosynthesis Reactions of metals Light	Summer Term 1 title: Genes and inheritance The Earth	
Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	
To explore how humans can lead of healthy lifestyle with a focus on diet, the digestive system and drugs. To explore the methods of separating based on properties of substances, with a focus on solubility, filtration and evaporation. To explore the methods of separating based on properties of substances, with a focus on distillation and chromatography.	To explore how food chains/webs show how organisms are interdependent on each other and the problems associated with this in terms of bioaccumulation. To explore the reactions of metals with acids and oxygen. To explore the reactions of metals with water, and to use the range of metal reactions to describe reactivity of metals. To apply the understanding of reactivity to displacement reactions. To explore light waves and reflection.	To apply understanding of natural selection to extinction and biodiversity. To describe the structure of DNA as the biological molecule involved in natural selection. To explore the structure of the Earth's atmosphere, with a focus on global warming.	
Summative assessment:	Summative assessment:	Summative assessment:	
B5 Knowledge and working scientifically assessment.	B6 Knowledge and working scientifically assessment. C5 Knowledge and working scientifically assessment.	B7 Knowledge and working scientifically assessment. End of Year 7 Assessment	
Autumn Term 2 title: Heating processes Photosynthesis	Spring Term 2 title: Light Genes and inheritance	Summer Term 2 title: The Earth Electricity and Magnetism	
Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	

To explore the difference between energy and temperature. To explore the three methods of energy transfer (conduction, convection, and radiation). To apply knowledge of energy transfers to insulators. To explore the differences between reflection and refraction. To explore the structure of plant leaves, and the importance of photosynthesis in these organs. To explore the importance of photosynthesis as the reaction that allows plants to grow and how these organisms can be the start of food chains and webs.	To explore light waves and refraction. To explore colour and filters, and to apply this knowledge to cameras, the eye and lenses. To explore the main components of evolution by natural selection, including variation, competition, adaptation. To explore the process of classification of living organisms.	To explore climate change. To explore how humans can make use of the resources in the Earth's crust with a focus on extracting metals and recycling. To explore static electricity, as well as the differences between current and potential difference. To explore static electricity, as well as the differences between series and parallel circuits. To explore the properties and uses of magnets. To apply understanding of magnets and electricity to look at the formation of electromagnets and their uses.
Summative assessment:	Summative assessment:	Summative assessment:
C4 Knowledge and working scientifically assessment. P4 Knowledge and working scientifically assessment. Milestone assessment	P5 Knowledge and working scientifically assessment.	C6 Knowledge and working scientifically assessment. P6 Knowledge and working scientifically assessment.

Key Stage 3 Science			
Year title / big question:		Foundation to GCSE	Year group: 9
Autumn Term 1 title: Genes and Inheritance Periodic Tables and Reactions		Spring Term 1 title: Cell Structure & Microscopes Review Separating Techniques	Summer Term 1 title: Plants and Photosynthesis
Intent and composite knowledge (overview):		Intent and composite knowledge (overview):	Intent and composite knowledge (overview):
Develop pupils' understanding of how variation arises from both inherited and environmental factors. To build secure knowledge of how organisms are classified, including the importance of Carl Linnaeus' system. To explain how organisms compete for resources and how adaptations improve survival and reproductive success. To understand the process of natural selection and its role in driving evolution. To explore causes and consequences of extinction and the importance of biodiversity. To introduce the structure and function of DNA, chromosomes, and genes, including their role in inheritance. To develop pupils' understanding of the structure and organisation of the periodic table, including		• To develop a secure understanding of the structure and function of animal, plant, and bacterial cells, including the differences between eukaryotic and prokaryotic cells. • To understand the role and function of sub-cellular structures and how they contribute to the life processes of cells. • To explore the concept of cell specialization and how structural adaptations enable cells to perform specific functions. • To enable students to confidently use light microscopes to observe cells and prepare slides using appropriate techniques and safety measures. • To develop skills in calculating magnification and converting between units (mm, μm, nm) using appropriate formulae. • To promote accurate biological drawing skills, including labelling and calculating magnification. • To understand the differences between elements, compounds, and mixtures, and how their properties influence separation techniques. • To explore the concept of purity and how it relates to melting and boiling points. • To understand the principles behind key separation techniques including filtration, crystallisation, distillation, and chromatography.	• To understand the structure and function of plant organs and tissues, including the roles of xylem, phloem, stomata, and mesophyll layers. • To explore the process of photosynthesis, including the word equation, limiting factors, and how plants use glucose. • To investigate the mechanisms of water and sugar transport in plants through transpiration and translocation. • To develop practical skills through required experiments such as investigating stomata distribution and measuring the rate of photosynthesis. • To interpret and analyse data from experiments, graphs, and tables, including calculating means and rates. • To apply scientific methods to evaluate experimental design, control variables, and sources of error.

how it was developed historically and how it is used today. To build secure knowledge of the key groups in the periodic table (Groups 1, 7, and 0), their trends in physical and chemical properties, and their patterns of reactivity.	• To develop practical skills in carrying out separation techniques safely and accurately, including the use of appropriate equipment and methods. • To interpret data from experiments such as the stearic acid cooling curve and chromatography results. • To calculate R_f values and use them to identify substances in mixtures.	
Summative assessment:	Summative assessment:	Summative assessment:
B7 Knowledge and working scientifically assessment	Synoptic half termly assessment	Synoptic half termly assessment
Autumn Term 2 title: Periodic Table and Reactions Space	Spring Term 2 title: Energy Resources and Density	Summer Term 2 title: Atoms, Elements & Compounds
Intent and composite knowledge (overview):	Intent and composite knowledge (overview):	Intent and composite knowledge (overview):
To enable pupils to explain and predict chemical reactions of elements, including displacement reactions, using knowledge of reactivity trends. To teach pupils how energy changes occur in chemical reactions, distinguishing between exothermic and endothermic processes. To apply understanding of combustion and thermal decomposition to real-world contexts, including fuels, environmental impacts, and industrial applications. To reinforce disciplinary knowledge by exploring how scientific models and theories, such as	• To understand and apply the concept of density, including the relationship between mass, volume, and density, and how it determines whether objects float or sink. • To explore the global energy crisis, including the causes, consequences, and the role of science in addressing energy demands. • To compare renewable and non-renewable energy resources, including their advantages, disadvantages, and environmental impacts. • To develop skills in accurate measurement, including the use of SI units and appropriate equipment for measuring mass, volume, and temperature.	• To understand the historical development of the periodic table and atomic models, including contributions from Dalton, Thomson, Rutherford, Bohr, and Chadwick. • To explore the structure of the atom, including subatomic particles, isotopes, and electronic configurations. • To understand how atomic structure relates to the chemical properties and placement of elements in the periodic table. • To develop skills in interpreting atomic diagrams, calculating relative atomic mass (A_r), and identifying isotopes. • To analyse experimental evidence that led to changes in atomic theory, such as the gold foil experiment.

Mendeleev's periodic table, have developed over time. To develop pupils' understanding of the Earth, Moon and Sun system, including day and night, the seasons and the phases of the Moon. To build knowledge of gravity as a universal force that governs the motion of planets, moons and satellites. To teach pupils the difference between mass and weight, and how gravitational field strength varies across the solar system. To explore the structure of our solar system, distinguishing between rocky planets, gas giants and dwarf planets. To understand how the solar system was formed from a nebula around 4.6 billion years ago. To study the life cycle of stars, including the differences between smaller stars like our Sun and larger stars that become supernovae, neutron stars or black holes.	• To carry out the required practical for investigating density using both regular and irregular shaped objects. • To interpret and analyse data from experiments and graphs, including cooling curves and energy usage trends.	• To apply scientific methods to solve problems involving atomic number, mass number, and electron arrangements.
Summative assessment:	Summative assessment:	Summative assessment:
C7 Knowledge and working scientifically assessment. P7 Knowledge and working scientifically assessment. Milestone assessment	Synoptic half termly assessment	Synoptic half termly assessment