

## Key Stage 3

## Programme of Study: Science

Year Group	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
7	Topic: Chemical Reactions	Topic: Variation	Topic: Forces	Topic: Particles	Topic: Space	Topic: Cells & Reproduction
	<ul> <li>Key Knowledge:</li> <li>Understand and develop basic laboratory and practical skills</li> <li>Develop graph skills</li> <li>Use the periodic table effectively to identify elements and understand how some</li> </ul>	<ul> <li>Key Knowledge:</li> <li>Understand and give examples of variation within species</li> <li>Differentiate between vertebrates and invertebrates</li> <li>Describe different habitats that organisms live in and</li> </ul>	<ul> <li>Key Knowledge:</li> <li>Understand what is meant by speed and be able to calculate it</li> <li>Plan and carry out a practical on the speed of a toy car</li> <li>Use and interpret distance-time graphs</li> </ul>	<ul> <li>Key Knowledge:</li> <li>Understand subject terminology including mass, matter and density</li> <li>Understanding of particle theory in solids, liquids and gases</li> <li>Be able to describe</li> </ul>	<ul> <li>Key Knowledge:</li> <li>Understand causes of day and night and how it changes throughout the year</li> <li>Develop on existing knowledge of gravity</li> <li>Explain how</li> </ul>	<ul> <li>Key Knowledge:</li> <li>Understand features of living organisms</li> <li>Recall key features of plant and animal cells including specialised cells</li> <li>Explain reproduction of</li> </ul>
	<ul> <li>of these elements form the human body</li> <li>Comparison of the properties of metals and non-metals</li> <li>Understand and practically demonstrate factors affecting rate of reaction</li> <li>How indicators can be used to identify pH levels and understand</li> </ul>	<ul> <li>the human impact on them</li> <li>Understand how different populations can be sampled</li> <li>Identify and describe adaptations in species</li> <li>Understand predator-prey relationships</li> <li>Understand how parasites affect</li> </ul>	<ul> <li>Understand different types of forces including gravity</li> <li>Know the difference between mass and weight</li> <li>Understand levers and be able to calculate moments</li> <li>Understand magnetic fields</li> </ul>	<ul> <li>Understand what mixture are and how to separate them</li> <li>Explain what is meant by chromatography and conduct a practical demonstrating the separation of ink</li> <li>Understand all relevant separation techniques including distillation, evaporating and filtering</li> </ul>	<ul> <li>seasons occur</li> <li>Understand what a year is and why this is different on other planets</li> <li>Understand key features of our Solar System</li> <li>Explain what satellites are and what they are used for</li> <li>Describe how an</li> </ul>	<ul> <li>flowering plants</li> <li>Discuss organisms and micro- organisms used in agriculture and agricultural sustainability</li> <li>Understand key features of reproduction and pregnancy in animals</li> <li>Describe spread of</li> </ul>
	neutralisation reactions Assessment: Year 7 Chemical Reactions test	<ul> <li>animals</li> <li>How to use pyramids of biomass</li> <li>Interpret food webs</li> </ul> Assessment: Year 7 Variation test	<b>Assessment:</b> Year 7 Forces test	<ul> <li>Practical techniques</li> <li>Assessment: Year 7 Particles test</li> </ul>	eclipse occurs Mission to Mars project Assessment: Year 7 Space test	disease including STIs and discuss immunisation Assessment: Year 7 Cells and Reproduction test

Topic: Fi	tness	Topic: Atoms & Elements	Topic: Electricity & Circuits	Topic: Reactivity	Topic: Energy	Topic: Plants & Photosynthesis
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<b>Assessm</b> Year 8 Fi	<b>lent:</b> Itness Topic Test	Year 8 Atoms & Elements Topic Test	Assessment: Year 8 Electricity & Circuits Topic Test	Assessment: Year 8 Reactivity Topic Test	Assessment: Year 8 Energy Topic Test	Year 8 Plants & Photosynthesis Topic Test

<b>Topic:</b> Cell Biology & Organisation	Topic: Bioenergetics	<b>Topic:</b> Atomic Structure & Bonding	<b>Topic:</b> Chemical Analysis & The Atmosphere	<b>Topic:</b> Energy & Electricity	<b>Topic:</b> Particle model of matter
<ul> <li>Key Knowledge:</li> <li>To compare cell structure of eukaryotes and prokaryotes</li> <li>To explain the sub- cellular structure of animal and plant cells</li> <li>To explain how the structure of a cell relates to its function</li> <li>To explain the importance of cell differentiation</li> <li>To understand the application of microscopy techniques</li> <li>To describe and explain the process of cell division through mitosis</li> <li>To describe the function of stem cells</li> <li>To describe the function of stem cells</li> <li>To describe and explain transport in cells through osmosis, diffusion and active transport</li> <li>To recall the principles of organisation and relate them to animal tissues, organs and organ systems with a focus on the digestive system and the circulatory system</li> <li>To describe the relationship between</li> </ul>	<ul> <li>Key Knowledge:</li> <li>To represent photosynthesis using word and symbol equations and be able to discuss the factors affecting the rate of photosynthesis</li> <li>To describe the uses of glucose from photosynthesis</li> <li>To compare and contrast aerobic and anaerobic respiration</li> <li>To investigate the body's response to exercise</li> <li>To explain the importance of sugars, amino acids, fatty acids and glycerol in the synthesis and breakdown of carbohydrates, proteins and lipids</li> <li>To be able to explain what metabolism is</li> </ul>	<ul> <li>Key Knowledge:         <ul> <li>To define atoms, elements and compounds</li> <li>To use the periodic table to extract key information about the first 20 elements</li> <li>To understand the development of the periodic table</li> <li>To write word equations and balanced symbol equations for relevant reactions</li> <li>To define and recognise mixtures and be able to describe appropriate separation techniques</li> <li>To describe the development of the atom</li> </ul> </li> </ul>	<ul> <li>Key Knowledge:</li> <li>To distinguish between pure substances and formulations.</li> <li>To conduct chromatography experiments and calculate Rf values</li> <li>To be able to successfully test for the common gases: hydrogen, oxygen, carbon dioxide and chlorine.</li> <li>To recall the composition of the Earth's atmosphere today and the Earth's early atmosphere and describe how this has evolved over time.</li> <li>To explain how oxygen in the atmosphere has increased over time.</li> <li>To explain how carbon dioxide in the atmosphere has decreased over time.</li> <li>To explain the role of carbon dioxide and methane as greenhouse gases.</li> </ul>	<ul> <li>Key Knowledge: <ul> <li>To calculate the changes in energy involved when a system is changed by: heating, work done by forces, work done when a current flows</li> <li>Use, kinetic energy = 0.5 × mass × s peed 2</li> <li>Use, elastic potential energy = 0.5 × s pring constant × extension <sup>2</sup></li> <li>Use, g . p . e . = mass × gravitational field strength × height</li> <li>Use, change in thermal energy = mass × specific heat capacity × temperature change</li> <li>Use Power = Energy Transferred/Time and,</li> </ul> </li> </ul>	<ul> <li>Key Knowledge: <ul> <li>To calculate the density of materials using Density = Mass/ Volume</li> <li>to recognise/draw simple diagrams to model the difference between solids, liquids and gases</li> <li>To describe how, when substances change state (melt, freeze, boil, evaporate, condense or sublimate), mass is conserved</li> <li>To recall that the increase in temperature depends on the mass of the substance heated, the type of material and the energy input to the system</li> <li>To use Change in thermal</li> </ul> </li> </ul>

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Image: construct of the patterns of patterns of patterns of physical &• To construct the molecules in a gas is chemical properties of group 1, group 7• To compare and compare both its related to and its pressure elements.Image: construct the molecules physical &• To compare and compare and contrast ionic,• To compare and contrast ionic,		hence to their		the application	heat
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group 1, group 7       and contrast       temperature         & group 0       both       and its pressure         elements.       To measure       To explain         To compare and       current,       qualitatively         contrast ionic,       To resistance and       the relation		properties of		-	both its
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To compare and current, qualitatively contrast ionic, the relation					•
contrast ionic, resistance and the relation		To compare an	E L		-
covalent and potential between the		covalent and			between the
metallic difference in temperature of					
bonding. To be a gas and its					

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able to	series and pressure at
represent each	parallel circuits constant
type of bonding	to explain the volume
with	difference
appropriate	between direct
diagrams.	and
To explain how	alternating
bonding	potential
determines	difference
structures	To describe
which give rise	the domestic
to the various	uses and
properties of	safety features
different	involved with
substances.	mains
To describe the	electricity
properties of	When
ionic	discussing
compounds,	energy
small molecules,	transfers be
polymers, giant	able to use
covalent	Power =
structures and	Potential
metals.	Difference x
To compare and	Current
contrast the	to describe
allotropes of	how different
carbon	domestic
(graphite,	
diamond,	appliances transfer
graphene and	energy from
fullerines)	
ruliennes)	batteries or ac
	mains to the
	kinetic
	energy of
	electric motors
	or the energy
	of heating
	devices
	to explain why
	the National
	Grid system is

	<b>Assessment:</b> Year 9 Cell Biology & Organisation Test	<b>Assessment:</b> Year 9 Bioenergetics Test	<b>Assessment:</b> Year 9 Atomic Structure & Bonding Test	<b>Assessment:</b> Year 9 Chemical Analysis & The Atmosphere Test	an efficient way to transfer energy <b>Assessment:</b> Year 9 Energy & Electricity Test	Assessment: Year 9 Particle model of matter Test
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