	Science Years 7- 9 Curriculum Intent
Years 7 and 8	Our Key Stage 3 (KS3) course follows AQA Science Syllabus. Our aim is to develop students into scientists and promote a love for science by providing students with opportunities to access many experiences with potential for embarking upon STEM-based careers. We support all pupils to have a broad and deep understanding of the sciences through immersion in our engaging spiral curriculum. Using the big ideas principle, the generalisations, principles and models which connect concepts are at the heart of our KS3 curriculum. We believe this is how students learn to see the world analytically, to explain phenomena and make predictions – all skills they need for their next stage of scientific learning.
	Our KS3 curriculum Content is divided under 10 big idea headings for Y7 and 8: Forces, Electromagnetism, Energy, Waves, Matter, Reactions, Earth, Organisms, Ecosystems and Genes & Variation. Each big idea topic contains four smaller topics that build in complexity. For example 'Waves', topics are ordered from simpler, more concrete topics 'Light' and 'Sound', to more abstract ones 'Wave properties' and 'Wave effects'. These have been created to avoid repetition, draw on various scientific skills and use different contexts. By connecting smaller ideas to more abstract ideas, students will be better prepared to apply these concepts when approaching an unfamiliar topic. The department has constructed a new unit for 'Becoming A Scientist' to develop all year 7 pupils practical and enquiry skills, critical understanding of evidence and communication. We link our Big Ideas to the potential careers in Science and the routes through A levels and higher education.
	We have embedded the Cognitive Acceleration through Science Education (CASE) in our Curriculum. The CASE is delivered over two years (year 7 and 8) to challenge students' thinking, develop their metacognitive skills, and encourage cooperative learning. We believe that the CASE materials are effective in raising achievement because they are built around a strong model of how children learn.
Year 9	All students in Year 9 study this subject. Students continue to study National Curriculum content and develop transferable skills and foundation knowledge in order to support the transition to KS4 and GCSE study. Some appropriate GCSE content will be covered from the autumn term of Year 9.

	Curriculum Implementation							
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2		
Year 7	<b>Being a Scientist</b> Calculate a mean from a set of data. Spot a data point that does not fit the pattern.	<b>Cells</b> Be able to use light microscope to observe and draw cell.	<b>Ecosystem</b> Identify parts of the flower and link their structure to their function.	<b>Reactions</b> Describe an oxidation, displacement, or metal acid reaction with a word equation.	<b>Electricity</b> Calculate resistance using the formula: resistance (Ω) =	Waves Explain observations where sound is reflected, transmitted or		

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each piece of evidence helps a particular (hours) x price (per particles.	5					on the arrangement and
		journey to the moon.				
I supports your opinion.				helps a particular		particles.
	supports your opinion.				kWh).	

Explain why each piece of evidence does not support other opinions. Earth Explain why a rock has a particular property based on how it was formed. Identify the causes of	Investigate factors that affect the size of frictional or drag forces Investigate how pressure from your foot onto the ground varies with different footwear Describe the difference between contact and	species in a changing environment. Explain how characteristics of a species are adapted to	Compare the amounts of energy transferred by different foods and activities. Explain the advantages	Explain changes in states in terms of changes to the energy of particles.
<ul> <li>weathering and erosion and describe how they occur.</li> <li>Construct a labelled diagram to identify the processes of the rock cycle.</li> <li>Identify circumstances that indicate fast processes of change on Earth and those that indicate slower processes.</li> <li>Describe the appearance of planets or moons from diagrams showing their position in relation to the Earth and Sun.</li> <li>Explain why places on the Earth experience different daylight hours and amounts of sunlight</li> </ul>		particular environmental conditions. Explain whether substances are passed from the mother to the foetus or not. Use a diagram to show stages in development of a foetus from the production of sex cells to birth. Identify key events on a diagram of the menstrual cycle.	and disadvantages of different energy resources. Represent the energy transfers from a renewable or non-renewable resource to an electrical device in the home. Compare the running costs of fluorescent and filament light bulbs Show how energy is transferred between energy stores in a range of real-life examples. Calculate the useful energy and the amount dissipated, given values of input and output energy. Describe how electricity is generated using renewable and non-renewable energy sources.	Draw before and after diagrams of particles to explain observations about changes of state, gas pressure and diffusion. Explain how substances dissolve using the particle model. Understand how substances dissolve and the factors that affect solubility and be able to interpret solubility curves. Differentiate between compounds and mixtures and start looking at different separation techniques. Choose the most suitable technique to separate out a mixture of substances.
the Earth experience different daylight hours			non-renewable energy sources.	
Describe how space exploration and observations of stars			dissipated in a range of situations.	

	are affected by the scale of the universe. Explain the choice of particular units for measuring distance. Predict patterns in day length, the Sun's intensity or an object's shadow at different latitudes.					
Year 8	Genes Describe the theories of evolutions Evaluate whether evidence for a species changing over time supports natural selection. Explain how a lack of biodiversity can affect an ecosystem. Evaluate ways of preserving plant or animal material for future generations. Use a diagram to show the relationship between DNA, chromosomes and genes. Use a diagram to show how genes are inherited. Explain how a change in the DNA (mutation) may affect an organism and its future offspring.	Forces Describe how materials behave as they are stretched or squashed. Describe what happens to the length of a spring when the force on it changes. Explain whether an object in an unfamiliar situation is in equilibrium. Using force and extension data, compare the behaviour of different materials in deformation using the idea of proportionality. Explain why objects either sink or float depending upon their weight and the upthrust acting on them. Given unfamiliar situations, use the	Earth Use a diagram to show how carbon is recycled in the environment and through living things. Describe how human activities affect the carbon cycle. Describe how global warming can impact on climate and local weather patterns. Evaluate the implications of a proposal to reduce carbon emissions. Evaluate claims that human activity is causing global warming or climate change. Explain why recycling of some materials is particularly important. Describe how Earth's resources are turned	Ecosystem Use word equations to describe aerobic and anaerobic respiration. Explain how specific activities involve aerobic or anaerobic respiration. Describe ways in which plants obtain resources for photosynthesis. Explain why other organisms are dependent on photosynthesis. Use lab tests on variegated leaves to show that chlorophyll is essential for photosynthesis. Energy Draw a diagram to explain how a lever makes a job easier.	Electromagnetism Use a diagram to explain how an electromagnet can be made and how to change its strength. Explain the choice of electromagnets or permanent magnets for a device in terms of their properties. Suggest how bells, circuit breakers and loudspeakers work, from diagrams. Use the idea of field lines to show how the direction or strength of the field around a magnet varies. Explain observations about navigation using Earth's magnetic field. Predict how an object made of a magnetic material will behave if	

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		formula to calculate fluid	into useful materials or	Use the formula: work	placed in or rolled	
	Explain why offspring	pressure or stress on a	recycled.	done (J) = force (N) x	through a magnetic	
	from the same parents	, surface.	, ,	distance moved (m)	field.	
	look similar but are not		Justify the choice of	Compare and contrast		
	usually identical.	Organisms	extraction method for a	the advantages of	Waves	
	\$	Describe how organs	metal, given data about	different levers in terms	Describe the	
	Suggest arguments for	and tissues involved in	reactivity.	of the forces need and	longitudinal and	
	and against genetic	digestion are adapted	,	distance moved.	transverse waves	
	modification.	for their role	Reactions		Be able to use wave	
		Describe the events	Use experimental	Explain how an electric	equation v=fλ	
	Matter	that take place in order	observations to	motor raising a weight is		
	Be able to read periodic	to turn a meal into	distinguish exothermic	doing work	Use ray diagrams to	
	in periods and groups.	simple food molecules	and endothermic	Explain observations	model how light passes	
		inside a cell.	reactions.	about changing	through lenses and	
	Describe the reaction of			temperature in terms of	transparent materials	
	an unfamiliar Group 1 or	Describe the respiratory	Use a diagram of	energy transfer.	Understand that light,	
	7 element.	system	relative energy levels of		like all waves can be	
		Explain how the parts of	particles to explain	Describe how an	reflected.	
	Use observations of a	the gas exchange	energy changes	object's temperature		
	pattern in chemical	system are adapted to	observed during a	changes over time when	Explain what is meant	
	reactions to predict the	their function.	change of state.	heated or cooled.	Explain what is meant	
	behaviour of an element				by refraction.	
	in a group.	Explain how changes in	Predict whether a	Explain how a method		
		volume and pressure	chemical reaction will be	of thermal insulation	Identify the difference	
	Name compounds using	inside the chest move	exothermic or	works in terms of	,	
	their chemical formulae.	gases in and out of the	endothermic given data	conduction, convection	between refraction and	
		lungs.	on bond strengths.	and radiation.	reflection.	
	Given chemical					
	formulae, name the		Use energy data to	Sketch diagrams to	Drow a simple diagram	
	elements present and		select a reaction for a	show convection	Draw a simple diagram	
	their relative		chemical hand warmer	currents in unfamiliar	to show how light is	
	proportions.		or cool pack.	situations.	refracted when	
			Predict the products of		travelling from air to	
	Represent atoms,		the combustion or	Compare and contrast	glass to air.	
	molecules and		thermal decomposition	the three ways that		
	elements, mixtures and		of a given reactant and	energy can be moved		
	compounds using		show the reaction as a	from one place to	Describe the path of	
	particle diagrams.		word equation.	another by heating.	light from its source	
			Evaloin abactisticat		through your eye.	
	Use observations from		Explain observations			
	chemical reactions to		about mass in a		Describe how refraction	
	decide if an unknown		chemical or physical		leads to the formation of	
	substance is an element		change.		a focused image.	
	or a compound.					

	Compare and contrast the properties of elements and compounds and give a reason for their differences. Describe and explain the properties of ceramics and composites		Use particle diagrams to show what happens in a reaction.		Explain the effect of convex and concave lenses on a light ray. Explain how lenses can be used to correct problems with vision.	
Year 9	the properties of ceramics and		<b>Bonding</b> : In this topic we Chemists who use theorem of the properties of materials. structures that atoms can some of which are mole giant structures. We could be bonding to explain how together in these struct future where scientists structure and bonding to materials with desirable properties of these materials with desirable properties of these materials with desirable properties. <b>Electricity</b> : In this physical that electric charge property of matter every ensure students underst the microstructure of constructions in a range technologies. We also many circuits are power electric the microstructure of the many circuits are power electricity, but portable use batteries of some k topic as electrical power el	bries of structure and obysical and chemical We also analyse the an be arranged in, ecular while others are ver the theories of atoms are held ures. We look to the use this knowledge of o engineer new e properties. The erials may offer new of different sics topic we cover the e is a fundamental ywhere. We try to stand the difference in onductors, sulators which makes it ponents and build o cover the idea that red with mains electrical devices must ind. This is an essential	Completion of whichever from the spring term. Infection: In this topic we pathogens are microorge viruses and bacteria that diseases in animals and on their host to provide nutrients that they need reproduce. They freque damage tissues and massection will explore how diseases by reducing convert well as how the body us pathogens. Once inside system is triggered whice enough to destroy the p disease. When at risk for dangerous diseases out can be enhanced by the We also look at historica medicines for examples range of antibiotics have which have proved succonverted unfortunately many group now become resistant to	ve cover the ideas that lanisms such as at cause infectious d plants. They depend the conditions and to grow and ntly produce toxins that ake us feel ill. This we can avoid ontact with them, as ses barriers against the body our immune ch is usually strong athogen and prevent om unusual or r body's natural system e use of vaccination. al development of since the 1940s a e been developed cessful against a es caused by bacteria. ertain future as ups of bacteria have