Sandhill View

Science Curriculum Policy

Aspire, Achieve, Enjoy

Academy Aim

Here at Sandhill View Academy, we aim to securely equip <u>all</u> of our students for life beyond school as successful, confident, responsible and respectful citizens. We believe that education provides the key to **social mobility** and our curriculum is designed to build strong foundations in the knowledge, understanding and skills which lead to **academic and personal success**. We want our students to **enjoy** the challenges that learning offers. Ultimately, we want students to '*Know More, Do More and Go Further*'

Our aims are underpinned by a culture of **high aspirations**. Through developing positive relationships, we work towards every individual having a strong belief in their own abilities so that they work hard, build resilience and **achieve** their very best.

<u>Intent</u>

We aim to provide a high-quality science education that provides the foundations for understanding the world through the disciplines of biology, chemistry and physics. Science is vital to the world's future prosperity, and our curriculum allows students to develop and apply their substantive knowledge, disciplinary knowledge and discover and participate within STEM careers. Through building up a body of core knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The curriculum aims to ensure that knowledge is taught to be remembered, not encountered. The curriculum embraces learning from cognitive science about memory, forgetting and the power of retrieval practice. Knowledge for each scheme is planned to be interleaved with prior and future learning to support students' understanding of the most complex concepts.

The curriculum aims for pupils to:

- Develop scientific substantive knowledge;
- Develop understanding of the nature, processes and methods of science through different types of scientific enquiry that help them answer scientific questions about the world around them;
- Develop and apply disciplinary knowledge such as: observational, practical, modelling, enquiry, problem solving and mathematical skills, both in the laboratory, in the field and other environments;
- Develop their ability to evaluate claims based on science through critical analysis of the methodology, evidence and conclusions, both qualitatively and quantitatively.

Each topic within the programme of study has a career attached which is covered, in detail, on a local, national, and global level. In addition to subject specific links, we aim to explicitly reinforce the skills and aptitudes which employers say are important in the workplace;

- Resilience (Aiming High, Staying Positive);
- Collaboration (Teamwork, Leadership, Listening, Speaking);
- Creativity (Problem Solving).

The British values of democracy, the rule of law, individual liberty, and mutual respect of those with different faiths and beliefs are taught explicitly and reinforced in the way in which the school operates.

Sequence and structure

COVID Recovery 'Unlocking Learning'

As the impact of COVID is now impacting on students who missed learning during KS2 all students complete a baseline assessment upon entering the Science curriculum in September. This allows for an understanding of the gaps in pupil knowledge and how to further support their progress in future planning. Many students missed the opportunity to complete practical activities that further develop their disciplinary knowledge and therefore an emphasis on students accessing practical experimental work is made. Students complete skills-based units throughout Year 7 and Year 8 to support student transition to Secondary education.

Literacy

We know that students who read well achieve well. As such all subject areas are committed to providing regular opportunities to read extensively. In Science we provide opportunities for students to read Tier 2 and Tier 3 vocabulary with an emphasis on comprehension and application. We also support our students to use ambitious vocabulary including using Frayer models and 'push' techniques to widen the vocabulary students can confidently include in the work they produce. Coherent and fluent writing skills are also imperative for student achievement, so we support student writing skills by offering opportunities for extended writing, with modelling, and sentence stems to support.

The Key Stage 3 Science Curriculum:

KNOW MORE: Our Key Stage 3 Science Curriculum includes the following areas of study:

Three year KS3 where students complete the KS3 National Curriculum as well as bridging topics known as 'Fundamentals' to support students accessing KS4. There are 8 hours per fortnight for Year 7 & 8, and then 10 hours per fortnight for Year 9.

KS3	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Year	Topic title and	Topic title and	Topic title	Topic title	Topic title and	Topic title and
7	key concept:	key concept:	and key	and key	key concept:	key concept:
	Introduction to	Particle Model	concept:	concept:	Human	Elements –
	Science – a	– the three	Speed – this	Earth's	reproduction –	an
	topic focused on	states of	topic focuses	Structure – a	the study of	introduction
	key scientific	matter and the	on	topic	how humans	to atoms,
	apparatus and	processes of	calculating	focussed on	develop as they	elements,
	practical skills.	changing	and	how rocks	go through	and
		between them.	investigating	are formed	puberty as well	compounds
	Substantive	This unit also	speed of	including the	as the parts of	and how
	Knowledge:	includes a	objects and	composition	the	these are
	What are key	focus on gases	how this can	of the Earth	reproductive	written as
	pieces of	and how they	be	and specific	systems and	scientific
	apparatus and	exert pressure	represented	formations	how fertilisation	notifications.
	how are they	on objects.	graphically.	such as	and gestation	Cultortenting
	used?	Cultortouting	There are	ceramics.	occur. Students	Substantive
	Disciplinary	Substantive	also links to	Cubatantius	also discuss	Knowledge:
	knowledge	Knowledge:	changes in	Substantive	contraception	What is the
	Students	What are the	speed and	Knowledge:	and infertility.	difference
	complete	three states		How are		between

	practical	of matter and	the ideas of	rocks	Substantive	atoms,
	activities	what are the	acceleration.	formed?	Knowledge:	elements,
	including lighting	processes		lonnou	How do	and
	a bunsen	involved in	Substantive		animals	compounds
	burner, heating	changing	Knowledge:		reproduce?	and how are
	water, making a	between	How can	Disciplinary		these
	flare as well as	them?	speed be	knowledge:		represented
	labelling key		measured,	Practical		?
	scientific		calculated,	investigations	Disciplinary	•
	apparatus and		and	<u>in this unit</u>	knowledge:	
	introductions to	Disciplinary	represented	<u>include</u>	Students look	
	hazard symbols	knowledge:	graphically?	reactions of	at models of	Disciplinary
	and their	Practical		metals and	concepts such	knowledge:
	meanings.	activities		<u>rocks to</u>	as gestation,	Students can
	<u>meanings.</u>	include melting	Dissiplinary	observe their	conception and	<u>complete</u>
		and freezing	Disciplinary knowledge:	composition.	discuss ethical	<u>practical</u>
		substances	There is a		issues with	activities
	Cross-curricular	and measuring	practical		contraception	focussing on
	knowledge:	<u>the</u>	investigation	Cross-	and infertility	conservation
	Links to maths –	temperature of	included in	curricular		of mass and
	reading from a	<u>this.</u>	this topic that	knowledge:		how this links
	scale.	<u>Demonstration</u>	focuses on	Links to	Cross-curricular	to word
	Topic title and	<u>s of gas</u>	calculating	geography	knowledge:	equations
	key concept:	pressure are	speed by	and outdoor	Links to child	
	ney concept.	also used to	measuring	learning but	development	
	Cells – the study	<u>integrate</u>	the distance	studying how	and the	Cross-
	of animal and	learning with	travelled and	rocks are	gestation	curricular
	plant cells and	practical	time of a	formed and	period of the	knowledge:
	their organelles	observations.	moving	how this rock	foetus	•
	including		object.	cycle leads to		Links to
	specialised cells		Students also	changes in	Topic title and	maths for
	, in animals and	Cross-	work on	rock	key concept:	balancing
	plants. Students	curricular	graphs	formation.	Variation – this	equations
	, also focus on	knowledge:	representing			Topic title and
	key concepts	Graph skills		Topic title	topic focusses on the variation	Topic title and
	such as	link with maths	<u>journeys as</u> both	and key		key concept:
	diffusion to link		distance-time	concept:	within species and how this	Periodic
	with substances	Topic title and	and velocity-	Universe –	variation can be	Table – A
	entering and	key concept:	time graphs.	this topic	beneficial for	study of the
	exiting cells.	Separating	There are	consists of	evolution	properties of
	-	mixtures – the	also	objects in the	ovolution	elements in
	Substantive	study of	opportunities	night sky and	Substantive	different
	Knowledge:	compounds	to use	the night sky and	Knowledge:	groups based
	What is the	and mixtures	equations	as well as	How does	on their
	structure and	and scientific	and calculate	how they	variation	positions in
	function of	techniques	speed, and	influence our	occur in	, the periodic
	organelles in	used to	acceleration	understandin	humans?	, table.
	different cells?	separate them.	from formula.	g of		
		30parate 1110111.		y oi phenomena		Substantive
		Substantive		on earth such	Disciplinary	Knowledge:
	<u>Disciplinary</u>	Knowledge:		as the	Disciplinary knowledge:	How is the
	knowledge:	-	Cross-	seasons and		
	Practical		curricular	SEASUIS dIIU	<u>Students</u>	periodic
I			I			

activities in this	How can	knowledge:	the phases of	investigate	table
topic include	mixtures be	Links to the	the moon	environmental	organised?
preparing slides	separated	maths		and inherited	5
of animal and	based on	curriculum	Substantive	characteristics	
plant cells and	their	through the	Knowledge:	and how this	Dissipling
viewing these	component	speed =	What is the	variation is	<u>Disciplinary</u>
under a	substances?	distance/time	composition	representative	knowledge:
microscope.		equation as	of space?	of the human	Students
Students can		well as		population	complete a
also complete	Dissipling	calculating		·	practical
calculations of	Disciplinary	acceleration	Disciplinary		investigation
magnification for	knowledge:	using the	knowledge: A		of the
microscopic	There are	rearrangeme	practical	Cross-curricular	properties of
samples.	several	nt of formula	investigation	knowledge:	group 1
	practical	and	into the	Links to the	metals.
	activities in this	substitution.	impact of	mathematics	Students
	topic including		meteors on	curriculum	complete an
Cross-curricular	filtering	Topic title	the surface of	through the	investigation
knowledge: Links to	insoluble	and key	the Earth and	study of data; continuous and	into
	solids and	concept:	how	discontinuous	displacement
adaptations of cells including	solvents,	Interdenende	scientists can	and how it can	reactions.
single celled	crystallisation	Interdepende nce –	determine	be displayed	
organisms to	of soluble	students	information	be displayed	
Geography	solids and	study the	about these		Cross-
Coography	solvents,	relationships	meteors from		curricular
Topic title and	distillation of	between	their craters.		knowledge:
key concept:	mixtures of	predators			knowledge.
	liquids, and	and prey and			Links to
Movement – the	chromatograph	how they	Cross-		engineering
study of how the	<u>y used to</u>	connect	curricular		and the
human body	<u>separate</u>	through food	knowledge:		properties of
facilitates movement	<u>colours.</u>	chains and	Links to the		materials
including joints,	Students also	food webs.	mathematics		Topic title and
muscles, and	focus on	There is also	curriculum		key concept:
bones.	<u>scientific</u>	a focus of	including		νελ τουτερί.
00100.	method	how humans	calculations		Acids and
Substantive	including	affect these	of orbits		alkalis – this
Knowledge:	<u>planning</u>	including	Tani (11		topic focus on
How do	practical motheda and	using	Topic title		testing for
muscles,	methods and	chemicals	and key		acids and
bones, and	graph skills.	such as	concept:		alkalis as well
joints create		pesticides	Energy costs		as indicators
movement in		and	and transfers		and how
the human	Cross-	fertilisers.	- how		neutralisation
body?	curricular	Substantive	electricity is		reactions
	knowledge:	Knowledge:	generated		occur.
	Links to graph	How are	and the cost		Substantive
Disciplinary	skills covered	animals and	of this to		Knowledge:
knowledge:	in the maths	plants	people		How can we
Practical	curriculum	connected?	Output th		identify
activities include			Substantive		
<u>a muscle</u>			Knowledge:		

	a funa na actile	Tania (10) - 1		Mile of star 14	a al al a ser l
	<u>strength</u>	Topic title and		What does it	acids and
	practical	key concept:	Disciplinery	cost to	alkalis?
	focussing on	Orrest the state	Disciplinary	generate	
	antagonistic	Gravity – the	knowledge:	electricity?	
	muscles.	study of	Students		Dissipling
		gravity, mass,	develop their		<u>Disciplinary</u>
		and weight	<u>understandin</u>		knowledge:
		and the	g of scientific	Disciplinary	Students
	Cross-curricular	physical laws	diagrams and	knowledge:	<u>investigate</u>
	knowledge:	that connect	how they can	<u>The</u>	<u>different</u>
	Links to PE and	them.	be explained	development	indicators and
	muscle strength		<u>be explained</u>	of	test
	including how	Substantive		mathematical	chemicals to
	muscles can be	Knowledge:		skills by	discover if
		Kilowieuge.	Cross-		
	built through	How are	curricular	calculating	they are
	exercise.	mass, weight,	knowledge:	<u>energy in</u>	acidic or
			Links to the	<u>various</u>	alkaline.
		and gravity		<u>scenarios</u>	Students will
		connected?	geography		<u>complete</u>
			and outdoor		neutralisation
			learning	Cross-	reactions and
		Disciplinary	curriculum		discover what
		knowledge:	through the	curricular	happens
		intowiougo.	use of	knowledge:	when acids
		Practical	fertilisers and	Links to	and alkalis
		activities	pesticides	engineering	
		include	and how they	and how	are
		measuring	lead to	electricity is	combined.
			bioaccumulat	generated in	
		forces using		power	
		newton meters	ion	stations	Cross-
		for different	Topic title	otationio	curricular
		masses to	and key		knowledge:
		determine the	concept:		knowledge.
		value of	concept.		Links to food
		gravitational	Plant		technology as
		field strength	reproduction		students test
		on Earth.	– the main		some foods
		Students are	reproductive		
		also able to			using different
		draw	organs in		
		conclusions	plants and		indicators
		from	how they		Topic title and
		demonstration	lead to		
			pollination		key concept:
		<u>s of objects</u>	and		Electricity –
		falling in a	germination.		this topic
		vacuum.			includes
			Substantive		circuit
			Knowledge:		
		Cross-	How do		symbols and
		curricular	plants		their uses as
		knowledge:	reproduce?		well as the
		•	-		concepts of
		Links to using			potential
		and			 difference,
·		•		·	

			Director			
		rearranging	Disciplinary			current and
		equations with	knowledge:			how static
		the maths	Students			electricity is
		curriculum as	<u>complete a</u>			caused.
		well as a focus	practical			
		on graph skills.	activity			Substantive
			related to the			Knowledge:
			shape of			How are
			seeds and			circuits
			their			made and
			dispersal			what
			methods			materials
			including			can be
			graphical			used?
			skills, writing			
			<u>methods,</u>			Dissipling
			apparatus,			Disciplinary
			and writing			knowledge:
			conclusions			<u>Students</u>
			and			<u>make a</u>
			evaluations.			variety of
						circuits using
						<u>different</u>
			Cross-			<u>components</u>
			curricular			and test
						materials to
			knowledge:			see whether
			Links to			they can be
			geography			used in
			and outdoor			electrical
			learning for			
			how plants			<u>circuits.</u>
			spread their			
			seeds and			
			are fertilised			Cross-
			by pollinators			curricular
						knowledge:
						Links to
						engineering
						and electrical
						circuits
						circuits
	—	—	—	-	— • • • • •	—
Year	Topic title and	Topic title and	Topic title	Topic title	Topic title and	Topic title and
8	key concept:	key concept:	and key	and key	key concept:	key concept:
	Lightways	Digoctions the	concept:	concept:	Inhoritonas	Climate the
	Light waves –	Digestion: the	Dhat II		Inheritance –	Climate – the
	light is a wave	main nutrients	Photosynthes	Contact	students	study of the
	that transfers	found in food	is – the study	forces – the	develop their	Earth's

energy from a	and how are	of the	study of	understanding	atmosphere,
			forces and	-	
luminous object.	they broken	process of		of genetics	changes to
Light travels in	down in the	photosynthes	how forces	including the	this including
straight lines	body.	is and some	can cause	history of DNA	climate
and can reflect	Substantive	factors that	movement	and how	change and
and refract	Knowledge:	can affect the	when they	characteristics	how the
based on the	What is a	rate	are not in	are inherited	carbon cycle
density and	balanced diet	Substantive	equilibrium	Substantive	is affected by
surface of an	and how does	Knowledge:	Substantive	Knowledge:	living
object.	our body	How do	Knowledge	What is the	organisms
Substantive		plants	How do	structure of	Substantive
	digest food?	•	different	DNA?	
Knowledge:		produce		DNA (Knowledge:
What is light		glucose?	forces affect		What is the
and how does	Disciplinary		objects?		carbon cycle
it travel?	knowledge:			Disciplinary	and how do
Disciplinary	The main	Disciplinary		knowledge:	humans
knowledge:	practical	knowledge:	Disciplinary	Students	affect it?
Practical	activity is	Students	knowledge:	develop their	
activities include	testing foods	investigate	Students	understanding	
investigating	for different	some factors	complete	of data by	Disciplinary
	nutrients	that affect the	practical	focussing on	knowledge:
angles of reflection as well	including how	rate of	activities	continuous and	Students
	to recognise	photosynthes	focussing on	discontinuous	develop their
as angles of refraction.	positive tests.	is	elastic	data and how	understandin
		<u> </u>	objects, as	this is displayed	g of data by
<u>Students also</u>			well as drag		focussing on
focus on	0	0	forces for		analysing
improving their	Cross-	Cross-	solids, and		graphs
mathematical	curricular	curricular	liquids.	Cross-curricular	showing
skills by using a	knowledge:	knowledge:	<u></u>	knowledge:	carbon
protractor to	Links to	Links to		Links to the	dioxide levels
measure angles.	catering and a	geography		maths	in the
	balanced diet.	and	Cross-	curriculum and	atmosphere
	Topic title and	adaptations	curricular	displaying data	over time
Cross-curricular	key concept:	of plants for	knowledge:	Topic title and	
knowledge:	Ney concept.	different	Links to	key concept:	
Links to	Breathing:	climates	engineering	Ney concept.	
mathematics	What the	Ciinales	based on	Evolution – the	Cross-
and measuring	composition of	Topic title	moments and	study of how	curricular
angles using a	the air is and	and key	the effect of	DNA	knowledge:
protractor	how gases	concept:	turning	inheritance can	Links to
	travel through		forces.	cause changes	Geography
Topic title and	the body to the	Chemical	Topic 44	in species over	and how the
key concept:	alveoli to be	Energy – this	Topic title	time	changing
Original	diffused into	topic	and key		climate
Sound waves:	the blood.	focusses on	concept:	Substantive	affects
sound is a		energy	Pressure –	Knowledge:	populations
longitudinal	Substantive	changes	this topic	What is the	
wave that	Knowledge:	during	studies	process of	Topic title and
requires a	What is the	chemical	pressure in	evolution?	key concept:
medium to travel	_	reactions and	solids,		Forth's
through.			liquids, and		Earth's
					resources –

Students focus	process of	how this can	(2000)		students
on the pitch and	breathing?		gases		discover how
,	breathing :	be measured	including	Disciplinary	
loudness of		Substantive	some factors	knowledge:	metals are
sounds and how		Knowledge:	that affect	Students	extracted
oscilloscope	Disciplinary	Kilowieuge.	this.	analyse data to	from the
traces represent	knowledge:	What are	Cubatantiva	-	Earth and
sound waves as	Students	endothermic	Substantive	<u>identify</u>	how humans
well as uses of	completed	and	Knowledge:	<u>changes in</u>	try to
sound waves by	skills work on	exothermic	What are	species over	conserve
humans and		reactions?	factors that	<u>time</u>	these
animals.	measuring their lung	reactions :	affect		materials
	their lung		pressure in		through
Substantive	volume and		different	Cross-curricular	recycling
Knowledge:	comparing this	Disciplinary	changes of	knowledge:	, c c y cg
	to other body	knowledge:	state?	Links to	
How can the	qualities such				
pitch and	as height.	Students		mathematics	Substantive
loudness of		complete a	Dissi	including	Knowledge:
sound waves		skills	Disciplinary	displaying and	How are
be changed?	Cross-	investigation	knowledge:	analysing data	metals
	curricular	focussed on	Students		obtained?
Disciplinary		temperature	watch		
knowledge:	knowledge:	changes in	<u>demonstratio</u>		
Teacher led	Links to PE	chemical	<u>ns of</u>		D
demonstrations	and the effect	reactions.	pressure in		Disciplinary
of sound in a	of exercise on	Students also	solids,		knowledge:
vacuum.	the body.		liquids, and		Students
	Tania (10 and	focus on	gases		<u>focus on</u>
	Topic title and	graph skills	including how		extracting
	key concept:	and	factors can		methods
Cross-curricular	Respiration:	<u>representing</u>	affect		<u>used by</u>
knowledge:		<u>data in</u>	pressure.		scientists and
Links to pitch	the study of	<u>different</u>	<u>prossuro.</u>		how these
and loudness of	the process of	<u>forms.</u>			have
sound waves to	respiration				changed over
Music	including the		Cross-		time
	different types	Cross-	curricular		<u></u>
	and how it is	curricular	knowledge:		
	used to make		Links to		
	products such	knowledge:	engineering		Cross-
	as alcoholic	Links to the	as the use of		curricular
	drinks and	mathematics	hydraulics		knowledge:
	bread.	curriculum	.,		Links to
		through			engineering
	Substantive	calculating			and how
	Knowledge:	means, and			metals are
	What are the	data analysis			extracted
	different	including			from the
	types of	graph skills			Earth
	respiration				
	and how are	Topic title			Topic title and
	they used?	and key			key concept:
	-	concept:			Metals and
		Types of			Non-Metals –
		reaction – in			the study of
					and study of

Disciplinary	this topic		the reactions
knowledge:	students		of metals and
Practical	develop their		non-metals
activity on the	understandin		with other
effect of	g of chemical		chemicals
exercise on	reactions		such as acids
	including		
breathing rate	•		and oxygen.
and heart rate	chemical and		Substantive
	physical		
	changes as		Knowledge:
Cross-	well as		How do
	thermal		metals react
curricular	decompositio		with
knowledge:	n and		different
Links to PE	combustion		chemicals?
and how			
respiration in	as examples		
exercise	of chemical		
affects the	reactions		Disciplinary
body			knowledge:
bouy	Substantive		
	Knowledge:		Students
	What are		identify
	different		properties of
	types of		metals and
	chemical		
			non-metals
	reactions?		by testing
			them. There
			<u>is also an</u>
	Disciplinary		investigation
			into the
	knowledge:		reactions of
	Students		metals and
	<u>complete</u>		
	practical		acids and
	activities		<u>how this links</u>
	including		to the
	combustion,		<u>reactivity</u>
	and thermal		series
			—
	decompositio		
	<u>n. There is a</u>		_
	<u>development</u>		Cross-
	of student		curricular
	understandin		knowledge:
	<u>g of</u>		J
	<u>conservation</u>		Links to
	of mass		mathematics
			and data
	through		analysis
	investigations		-
	into mass		including
	changes.		calculating a
			mean and
			representing
			data in

Cross-	graphical
curricular	forms.
knowledge:	
Links to	Topic title and
geography	key concept:
relating	Electromagne
changes of	ts – the study
state to	of permanent
physical	and
changes	temporary
rather than	
chemical	magnets and
changes.	how different
changes.	materials are
	affected in
	their
	magnetic
	fields
	noido
	Substantive
	Knowledge:
	What are
	permanent
	and
	temporary
	magnetic
	fields?
	Disciplinary
	knowledge:
	Students test
	different
	materials to
	materials to
	discover
	<u>discover</u> magnetic and
	discover magnetic and non-magnetic
	<u>discover</u> magnetic and
	discover magnetic and non-magnetic
	discover magnetic and non-magnetic materials. Students also
	discover magnetic and non-magnetic materials. Students also complete a
	discover magnetic and non-magnetic materials. Students also complete a skills
	discover magnetic and non-magnetic materials. Students also complete a skills investigation
	discovermagnetic andnon-magneticmaterials.Students alsocomplete askillsinvestigationinto factors
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	discover magnetic and non-magnetic materials. Students also complete a skills investigation into factors that affect the strength of temporary magnetic fields
	discover magnetic and non-magnetic materials. Students also complete a skills investigation into factors that affect the strength of temporary magnetic fields

						Links to engineering and the development of locking mechanisms as well as loudspeakers and microphones using the motor effect
Year	Topic title and	Topic title and	Topic title	Topic title	Topic title and	Topic title and
9	key concept:	key concept:	and key	and key	key concept:	key concept:
			concept:	concept:		
	Fundamentals:	Fundamentals: Materials -	Fundamental	Fundamental	Fundamentals: Reactions –	Fundamental s: Atoms –
	The Body – Students	Students	Fundamental s: Energy	s: Plants –	Students	s. Alonis – students
	develop their	develop their	Transfers –	students	investigate how	discover how
	understanding	understanding	students	develop their	to identify	different
	of cells by	of elements,	work on	understandin	gases	materials can
	studying	compounds,	describing	g of plants by	produced in	change
	prokaryotes and	and mixtures	and	looking at	chemical	between
	eukaryotes and	including how	calculating	plant tissues	reactions such	states and
	viewing cells	mixtures are	energy	and organ	as the	link this to the
	under a	separated.	transfers and	systems. The	conservation of	density of the
	microscope.	Students also	link this to electric	topic includes	mass	substance.
	Students also link the	focus on the layout of the	circuits.	the equation for	examples. This topic also	Students also focus on the
	movement of	periodic table	Students also	photosynthes	includes a	structure of
	substances in	and the mass	discover how	is and biotic	study of the	the atom and
	and out of cells	and formula of	forces are	and abiotic	process of	how our
	to the processes	compounds.	involved in	factors that	electrolysis and	model of the
	the substances		energy	affect plants.	separating ionic	atom has
	are involved in.	Substantive	transfers and	Substanting	compounds.	developed
	Students also	Knowledge: What are	how reaction	Substantive Knowledge:	Substantive	over time.
	look at the	elements,	time and	What are	Knowledge:	Substantive
	movement of	compounds,	stopping	factors that	What are the	Knowledge:
	pathogens into	and mixtures	distance are affected by	affect plant	tests for	How is the
	the body and the recognisable	and how are	different	tissues and	different	density of
	symptoms they	elements	factors	organs?	gases?	objects
	produce in the	displayed on				affected by
	body.	the periodic	Substantive		How does electrolysis	changes of
	-	table?	Knowledge:	Disciplinary	separate ionic	state?
	Substantive	Disciplinary	What are	knowledge:Pr	compounds?	What is the
	Knowledge: What	knowledge:	energy transfers	<u>actical</u>		structure of
	substances	Practical	and how are	activities for		the atom and
	move into and	activities in this	they	this topic can	Disciplinary	how has our
	out of	topic include	described in	include	knowledge:	modelling of
L	341.01				Michaelye.	

how are they used?Disciplinary knowledge: Students use microscopes to view a variety of cells and practice preparing slides for viewing. Practical investigations also include changes in mass related to osmosis.Cross-curricular knowledge: Links to the mathematics curriculum related to changes in mass and data analysis of trends in diseases over time.	of mass Cross- curricular knowledge: Links to the mathematics curriculum during calculations of relative	scenarios? Disciplinary knowledge: Practical activities include an investigation into the relationship between weight and mass Cross- curricular knowledge: Links to the mathematics curriculum through the substitution and rearrangeme nt of equations for calculating energy transfers	stomata under a microscope and observing photosynthes is related to factors that may affect it Cross- curricular knowledge: Links to Geography related to biotic and abiotic factors for plant growth.	benefit from demonstrations of chemical reactions that produce gases and what positive tests for each gas are. Students can also complete investigations into electrolysis. Students can complete practical investigations into endothermic and exothermic reactions and how these reactions are measured using temperature changes Cross-curricular knowledge: Links to engineering and the extraction of metals using electrolysis	over time?
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KNOW MORE: Our Key Stage 4 Curriculum

The KS4 Curriculum is taught over 2 years. Y10 and Y11 have 12 hours of Science per fortnight. 11/Sc1 complete AQA GCSE Separate Science (8461, 8462, 8463) whilst all other classes complete AQA GCSE Combined Science (8464).

KS3	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6

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Cross-curricular knowledge: Links to History and the development ofobjects. Students can also benefit from measuring theand from compoundsand factors that can affect this including the intake ofmeasuring the manner.practical activities in this topic including the			<u>irregular</u>				
knowledge: Links to History and the development ofStudents can also benefit from measuring thecompounds ?that can affect this including the intake ofStudents activities in this topic including the measurement			objects.				
Links to History and the development ofalso benefit from measuring the?anect this including the including theinvestigate how concentration, temperature, orthis topic including the		-	Students can				
and the development of from measuring the from How can including the intake of involugitor now concentration, temperature, or including the including the measurement			also benefit	-			
measuring the How can temperature, or measurement			from				
density of scientists		development of	measuring the	How can	Intake of		
					1	tomporature, or	measurement

medicine over	liquids.	determine if	caffeine and	surface area	of weight and
			distractions.		
time	Students	a substance is acidic or		affect rates of	<u>mass to</u>
Topic title and	investigate the			reaction.	determine the
key concept:	specific heat	alkaline and			<u>value of</u>
noy concepti	capacity of	what is	Cross-		gravitational
Quantitative	different	neutralisatio	curricular	Cross-curricular	field strength
Chemistry –	materials and	n?	knowledge:	knowledge:	on Earth.
students focus	practice setting		Links to the	Links to	Students
on calculations	<u>up electric</u>		PE	Outdoor	<u>investigate</u>
related to	circuits and	Disciplinary	curriculum	Learning and	acceleration
chemical	<u>taking</u>	knowledge:	measuring	the production	and how the
reactions	measurements	Practical	reaction time	of fertilisers	force applied
including	from these.	activities for		using dynamic	<u>to an object</u>
conservation of	Students can	this topic		equilibrium	can increase
mass.	also measure	include		- 4	<u>its</u>
	temperature	neutralisation			acceleration
Substantive	<u>changes</u>	reactions			proportionally
Knowledge:	<u>during</u>	producing			÷
What is	changes of	different salts			
conservation	state to create	as well as			
of mass?	their own	reactions			Cross-
	heating or	between			curricular
<u>Disciplinary</u>	cooling curves.	acids and			knowledge:
knowledge:	_	metals and			Links to the
Students can	Cross-	the products			mathematics
benefit from	curricular	of these.			curriculum as
demonstrations	knowledge:	Students can			
and practical	Links to the				students
investigations	mathematics	<u>also</u>			rearrange, substitute and
where mass	curriculum	investigate			
appears to	related to the	electrolysis of			calculate
<u>change during a</u>	displaying of	<u>different</u>			quantities
<u>chemical</u>	data for	substances			using
reaction	heating or	and discover			equations
0	cooling curves	the products			
Cross-curricular	as well as	<u>of</u>			
knowledge:	calculations	electrolysis.			
Links to the	using				
mathematics	equations				
curriculum	including	Cross-			
related to using	rearranging	curricular			
equations	and	knowledge:			
(rearranging and	substitution.	Links to			
substitution)		engineering			
	Topic title and	and the			
	key concept:	extraction of			
	Bioenergetics	metal from			
	– this topic	ores in the			
	focusses on	Earth			
	photosynthesis and respiration				
	which are the				

[]	turo manina	Topic Hills		
	two main	Topic title		
	processes in	and key		
	living things.	concept:		
	Students	Enorgy		
	investigate	Energy		
	factors that	Changes –		
	affect	this topic		
	photosynthesis	focusses on		
	and discuss	energy		
	the uses of	changes in		
	glucose in	chemical		
	plants as well	reactions		
	as different	such as		
	types of	endothermic		
	respiration and	and		
	uses of these.	exothermic		
		reactions		
	Substantive	with students		
	Knowledge:	representing		
	How do living	these		
	things	graphically		
	produce	as reaction		
	glucose and	profiles and		
	release	calculating		
	energy from	bond		
	it?	energies.		
	Disciplinary	Substantive		
	knowledge:	Knowledge:		
	<u>Students</u>	_		
	investigate	What are		
	factors that	energy		
	affect	changes in		
	photosynthesis	chemical		
	including light	reactions	1	
1 1	intensity and	and how can		
	intensity and wavelengths of	and how can they be		
	wavelengths of			
	wavelengths of light. Students	they be		
	wavelengths of light. Students also observe	they be mathematic		
	wavelengths of light. Students also observe the presence	they be mathematic ally		
	wavelengths of light. Students also observe the presence of starch in	they be mathematic ally represented		
	wavelengths of light. Students also observe the presence of starch in leaves as	they be mathematic ally represented		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of	they be mathematic ally represented ?		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from	they be mathematic ally represented ? Disciplinary		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis	they be mathematic ally represented ?		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are	they be mathematic ally represented ? Disciplinary knowledge:		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are opportunities	they be mathematic ally represented ? Disciplinary knowledge: Practical		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are opportunities to investigate	they be mathematic ally represented ? Disciplinary knowledge: Practical investigations		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are opportunities to investigate respiration	they be mathematic ally represented ? Disciplinary knowledge: Practical investigations in this topic		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are opportunities to investigate	they be mathematic ally represented ? Disciplinary knowledge: Practical investigations in this topic include		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are opportunities to investigate respiration	they be mathematic ally represented ? Disciplinary knowledge: Practical investigations in this topic include endothermic		
	wavelengths of light. Students also observe the presence of starch in leaves as storage of glucose from photosynthesis . There are opportunities to investigate respiration including	they be mathematic ally represented ? Disciplinary knowledge: Practical investigations in this topic include		

I	1	
	using yeast cells.Cross- curricular knowledge: Links to food technology and how fermentation as an exampl of anaerobic	<u>reactions.</u> <u>Students can</u> then
	respiration is used in the food industry.	graphically. Cross-
		curricular knowledge: Links to the mathematics curriculum including
		calculationsof bondenergies andreactionprofile graphanalysis
		Topic title and key concept:
		Atomic Structure – this topic focusses on nuclear radiation
		including the structure of the atom and how radiation is released
		as well as properties of the different types of radiation
		Substantive Knowledge: What is

nuclear radiation and what are its properties?	
Disciplinary knowledge: Students discuss models of the atom and how observational evidence has caused scientists to change these models. Students also use a modelled example to investigate half-life of nuclear radiation samples.	
Cross- curricular knowledge: Links to the mathematics curriculum including exponential graphs and how to interpret these.	

	Toute Cities and	Taula Clarand	Taula titla	Taula CH.		04
Year	Topic title and	Topic title and	Topic title	Topic title	Students will be	Students will
11	key concept:	key concept:	and key	and key	focussing on	have left after
	Rate and Extent	Inheritance	concept:	concept:	preparing for	their Summer
	of Change –	and Variation –	Chemical	Chemistry of	their Summer	Examinations
	students	this topic	analysis –	the	Examinations	
	investigate rates	focuses on	students	Atmosphere		
	of reaction in	DNA and how	discover how	– a study of		
	this topic	this is passed	chemical	the		
	including factors	on through	analysis	composition		
	that can	sexual and	techniques	of our		
	increase or	asexual	can be used	atmosphere		
	decrease this	reproduction.	to determine	and how this		
	rate. Students	Students also	the presence	has changed		
	also cover	discover how	of different	over the		
	dynamic	characteristics	gases as well	history of the		
	equilibrium and	are inherited	as soluble	Earth as well		
	Le Chatelier's	and that	substances	as the impact		
	principle and	variation in	found in	of humans on		
	how this is used	species can	chromatogra	this.		
	in industry to	lead to	ms. Students	uns.		
	produce	evolution in a	also work on	Substantive		
	products such	species and	chemical	Knowledge:		
	as ammonia.	how species	measuremen	How has the		
	do animonia.	that are unable	ts such as	Earth's		
	Substantive	to evolve risk	spectroscopy	atmosphere		
	Knowledge:	becoming	and	changed		
	What are	extinct.	identifying	over time		
	factors that	oxtimot.	ions in	and how		
	affect rates of	Substantive	substances.	have		
	reaction?	Knowledge:	cubotanooon	humans		
		What is the	Substantive	affected		
		structure of	Knowledge:	these		
	Disciplinary	DNA and how	How can	changes?		
	knowledge:	is it	scientists			
	<u>iaiomedgei</u>	replicated?	identify			
	Practical		unknown	Disciplinary		
	activities in this	What is	substances	knowledge:		
	topic are varied	evolution and	using			
	and include an	how can organisms	chemical	Students can		
	evaluation of	evolve over	analysis?	analyse data		
	how to collect	time?		<u>representatio</u>		
	gas released	ume :		<u>ns of</u>		
	from a chemical		Disciplinary	changes to		
	reaction in the		knowledge:	<u>the</u>		
	most accurate	Disciplinary		atmosphere		
	manner.	knowledge:	Students	of the Earth		
	<u>Students</u>	Students have	create their			
	investigate how	the opportunity	own			
	concentration,		chromatogra	Cross-		
	temperature, or	to create	ms and use	curricular		
	surface area	models of the	these to	knowledge:		
		double helix	determine	5-		

effect veter of	at we at the af	the e	Links to the	
affect rates of	structure of	the	Links to the	
reaction.	DNA. Students	<u>composition</u>	mathematics	
	use various	of different	curriculum as	
	models to	substances.	students	
Cross-curricular	show the	Students can	analyse	
knowledge:	process of	<u>also</u>	graphical	
Ŭ	evolution and	complete gas	representatio	
Links to Outdoor	how a change	<u>tests to</u>	ns of the	
Learning and	in environment	<u>determine</u>	Earth's	
the production	and variation	results of	atmosphere	
of fertilisers	<u>do not always</u>	positive tests	Tania titla	
using dynamic	lead to an	for different	Topic title	
equilibrium	<u>organism</u>	gases.	and key	
	evolving.	Students	concept:	
		studying	Using	
		Separate	Resources –	
	Cross-	Science can	a study of	
Topic title and	curricular	evaluate	sustainability	
key concept:		different	and the	
2 Parter	knowledge:	substances	environmenta	
Forces – the	Links to the	for the ions		
study of contact	History	which they	l impact of	
and non-contact	curriculum	contain using	products over	
forces and how	through the	flame tests	their life time	
these forces can	study of	and	including	
be measured	genetic	spectroscopy	minimising	
and calculated	inheritance		damaging	
in various	and how	-	effects.	
scenarios.	lineages used		Substantive	
Students also	genetic		Knowledge:	
study the motion	inheritance to	Topic title	Kilowieuge.	
of objects and	determine	and key	What is the	
calculate the		concept:	impact of	
velocities and	heirs	Maria the	products	
accelerations of	Topic title and	Waves – the	over their	
objects.	key concept:	study of	life cycle?	
	· · · · · · · · · · · · · · · · · · ·	energy	How can the	
Substantive	Organic	transfers in	impact of	
Knowledge:	Chemistry –	the form of	products be	
	the study of	transverse	reduced	
What are	organic	and	over time?	
forces and how	chemicals	longitudinal		
can they be	collected from	waves.		
calculated?	crude oil and	Students		
How can the	separated in	discover	Disciplinary	
motion of	fractional	more about	knowledge:	
	distillation.	the family of	Students	
objects be described and	Students	waves known	investigate	
	studying	as the	how potable	
quantified	separate	electromagne	water is	
based on the	science also	tic spectrum	made and	
forces acting	study various	and how	<u>the</u>	
on it?	reactions of	these are	processes	

	these	used in	involved in	
	hydrocarbons	various	treating	
Disciplinary	and how we	employment		
knowledge:	use them to	sectors.	sewage water and	
There are a	make	3001013.		
variety of	substances	Substantive	<u>ground</u>	
practical		Knowledge:	water.	
activities in this	such as	j		
topic including	carboxylic	What are		
the	acids, esters,	different	Cross-	
measurement of	alcohols and	types of	curricular	
weight and	polymers.	waves and	knowledge:	
mass to	Substantive	what are	Links to	
determine the	Knowledge:	they used	Geography	
value of	Kilowieuge.	for?	and the	
gravitational	What is crude		environmenta	
	oil and what		l impact of	
field strength on	does it	Dissipling	products	
Earth. Students	contain?	Disciplinary		
investigate		<u>knowledge:</u> T	Topic title	
acceleration and	How can	Transverse	and key	
how the force	crude oil be	and	concept:	
applied to an	separated?	longitudinal		
object can		waves are	Electromagn	
increase its		modelled by	etism – a	
acceleration	Disciplinary	teaching staff	study of	
proportionally.		<u>to</u>	magnetic	
	knowledge:	demonstrate	fields and the	
	Students can	<u>this</u>	link between	
Cross-curricular	test	unobservable	electricity	
knowledge:	substances to	<u>phenomenon</u>	and	
Links to the	discover if they	<u>. Students</u>	magnetism	
mathematics	are alkanes or	participate in		
curriculum as	alkenes using	calculating	Substantive	
students	bromine water.	the speed of	Knowledge:	
rearrange,		<u>a wave</u>	What are	
substitute and		based on	permanent	
calculate	Cross-	measuring	and	
quantities using	curricular	the	temporary	
equations	knowledge:	wavelength	magnets	
equalions	Links to	and	and the	
	engineering	frequency of	factors that	
	and the use of	a water wave	affect the	
	different	and a	strength of	
	substances in	standing	their fields?	
	crude oil being	wave.		
	used as fuels			
			Disciplinary	
			knowledge:	
		Cross-	Students are	
		curricular		
		knowledge:	<u>given the</u>	
		Links to the	opportunity to	
		IT curriculum	<u>investigate</u>	
			permanent	

and uses of	and
electromagne	temporary
tic waves in	<u>magnets</u>
transmitting	including
data	which
	materials
Topic title	they affect
and key	and factors
concept:	that can
	increase the
Ecology – the	
study of living	strength of
organisms in	the magnetic
communities	fields.
and how	Students
these	studying
communities	<u>Separate</u>
interact and	Science also
affect each	investigate
other.	the motor
Students	effect and
	how this
study	generates
scientific	movement.
techniques	
such as	
sampling and	
discuss how	Cross-
sampling can	curricular
be used to	knowledge:
identify	Links to the
populations	mathematics
in an area.	curriculum
	using
Substantive	equations
Knowledge:	including
How do	rearranging,
populations	substituting,
interact with	
each other	and
and what	calculating
factors	different
affect	quantities.
communitie	
s?	
Disciplinary	
knowledge:	
Practical	
activities	
include	
sampling	
techniques	

whore
where
students
estimate
population
numbers and
discuss
factors that
can affect
these
populations.
<u>Students also</u>
study a
variety of
graphical
representatio
ns of
changes to
populations
over time.
Cross
Cross-
curricular
knowledge:
Links to the
mathematics
curriculum as
students
analyse
graphs. Links
to the
Geography
curriculum
and the
factors that
affect living
communities.

DO MORE: Milestone assessment end points

Disciplinary knowledge in Science is often discussed as 'Working Scientifically' which has a range of skills related to practical work, modelling, analysis, and evaluation. The end points for this knowledge is split into different categories as shown below.

However, students must also be able to complete skills such as applying knowledge, evaluating data and hypotheses, explaining key concepts, and defining key terms. Below are end points for each of the year groups and topics based on these core skills.

|--|

Safety and Risk	Safety and Risk	Safety and Risk
Recognise risks when prompted	Act on suggestions to minimise risk	Independently recognise risks
<u>Apparatus</u>	<u>Apparatus</u>	<u>Apparatus</u>
Identify basic apparatus used in	Choose correct equipment from a	Independently choose the correct
investigations	selected list with prompts	equipment
Method	<u>Method</u>	Method
Suggest ways to investigate a	Hypothesise a result based on an	Suggest ways to investigate a
question	investigation	question
<u>Variables</u>	<u>Variables</u>	<u>Variables</u>
Name the three variables	Name a control variable from a list	Identify variables that are difficult to
<u>Graphs</u>	of variables	control
Label axes on a basic line or bar	<u>Graphs</u>	<u>Graphs</u>
graph	Label units on axes on basic line or	Plot points on basic line or bar
Conclusion and Evaluation	bar graphs	graphs
Identify straightforward patterns in	Conclusion and Evaluation	Conclusion and Evaluation
data	Make simple conclusions	Suggest ways to improve a method
Scientific method	Scientific method	Identify anomalies
Give examples of how scientific	Identify methods that can be used	Scientific method
methods and theories have changed	to tackle problems caused by	Describe specified examples of the
over time	human impacts on the environment	technological applications of science
Recognise/draw/interpret diagrams	Translate data to a representation	Describe methods that can be used
	with a model	to tackle problems caused by
		human impacts on the environment

Basic	Clear	Detailed
Safety and Risk	Safety and Risk	Safety and Risk
Act on suggestions to minimise risk	Independently recognise risks	Describe risks during specific
<u>Apparatus</u>	<u>Apparatus</u>	practical work
Choose correct equipment from a	Independently choose the correct	Identify hazards associated with
selected list with prompts	equipment	risks
<u>Method</u>	<u>Method</u>	<u>Apparatus</u>
Hypothesise a result based on an	Suggest ways to investigate a	Draw the set up of apparatus in
investigation	question	specific investigations
<u>Variables</u>	<u>Variables</u>	Method
Name a control variable from a list	Identify control variables	Describe a basic method including
of variables	independently	measurements that must be taken
<u>Graphs</u>	<u>Graphs</u>	Describe a basic method including
Label units on axes on basic line or	Plot points on basic line or bar	ranges and intervals
bar graphs	graphs	<u>Variables</u>
Conclusion and Evaluation	Conclusion and Evaluation	Recognise which variables to
Make simple conclusions	Suggest ways to improve a method	control, measure, and change
Scientific method	Identify anomalies	<u>Graphs</u>
Identify methods that can be used	Scientific method	Draw a line graph with support
to tackle problems caused by	Describe specified examples of the	Conclusion and Evaluation
human impacts on the environment	technological applications of science	Describe trends in graphs
		Describe trends in data

Translate data to a representation	Describe methods that can be used	Use data in conclusions
with a model	to tackle problems caused by	Scientific method
	human impacts on the environment	Explain why new data from
		experiments or observations led to
		changes in models or theories
		Use models in explanations or
		match features of a model to the
		data from experiments or
		observations that the model
		describes or explains
		Explain specified examples of the
		technological applications of science

Basic	Clear	Detailed
Safety and Risk	Safety and Risk	Safety and Risk
Independently recognise risks	Describe risks during specific	Independently recognise controls
<u>Apparatus</u>	practical work	for specific risks and hazards
Independently choose the correct	Identify hazards associated with	<u>Apparatus</u>
equipment	risks	Describe how apparatus can be set
Method	<u>Apparatus</u>	up for practical investigations
Suggest ways to investigate a	Draw the set up of apparatus in	Method
question	specific investigations	Describe a method including some
<u>Variables</u>	Method	of the variables
Identify variables that are difficult to	Describe a basic method including	<u>Variables</u>
control	measurements that must be taken	Explain why it is important to
<u>Graphs</u>	Describe a basic method including	control variables to minimise errors
Plot points on basic line or bar	ranges and intervals	Graphs
graphs	<u>Variables</u>	Draw a line graph independently
Conclusion and Evaluation	Recognise which variables to	Identify anomalies on a line graph
Suggest ways to improve a method	control, measure, and change	Conclusion and Evaluation
Identify anomalies	<u>Graphs</u>	Describe anomalies in terms of
Scientific method	Draw a line graph with support	methodology
Describe specified examples of the	Conclusion and Evaluation	Suggest practical improvements to
technological applications of science	Describe trends in graphs	methodology and data collection
Describe methods that can be used	Describe trends in data	Scientific method
to tackle problems caused by	Use data in conclusions	Decide whether or not given data
human impacts on the environment	Scientific method	supports a particular theory
	Explain why new data from	Give examples of ways in which a
	experiments or observations led to	model can be tested by observation
	changes in models or theories	or experiment
	Use models in explanations or	Make predictions or calculate
	match features of a model to the	quantities based on the model or
	data from experiments or	show its limitations

observations that the model describes or explains	
Explain specified examples of the technological applications of science	

Basic	Clear	Detailed
Safety and Risk	Safety and Risk	Safety and Risk
Describe risks during specific	Independently recognise controls	Explain risks and how these can be
practical work	for specific risks and hazards	controlled
Identify hazards associated with	<u>Apparatus</u>	<u>Apparatus</u>
risks	Describe measurements taken by	Describe measurements taken by
<u>Apparatus</u>	different pieces of apparatus	different pieces of apparatus
Draw the set up of apparatus in	Method	Method
specific investigations	Describe a method including some	Describe a full method including the
Method	of the variables	three variables
Describe a basic method including	<u>Variables</u>	Explain choices such as intervals and
measurements that must be taken	Explain the impact of not controlling	ranges of different variables
Describe a basic method including	specific variables	<u>Variables</u>
ranges and intervals	<u>Graphs</u>	Explain the impact of not controlling
<u>Variables</u>	Draw a line graph independently	specific variables
Recognise which variables to	Identify anomalies on a line graph	<u>Graphs</u>
control, measure, and change	Conclusion and Evaluation	Draw curves of best fit
<u>Graphs</u>	Describe anomalies in terms of	Conclusion and Evaluation
Draw a line graph with support	methodology	Identify quantitative relationships
Conclusion and Evaluation	Suggest practical improvements to	such as direct proportionality
Describe trends in graphs	methodology and data collection	Critically interpret data
Describe trends in data	Scientific method	Scientific method
Use data in conclusions	Decide whether or not given data	Evaluate methods that can be used
Scientific method	supports a particular theory	to tackle problems caused by
Explain why new data from	Give examples of ways in which a	human impacts on the environment
experiments or observations led to	model can be tested by observation	Suggest why the perception of risk
changes in models or theories	or experiment	is very often different from the
Use models in explanations or	Make predictions or calculate	measured risk
match features of a model to the	quantities based on the model or	
data from experiments or	show its limitations	

ſ	observations that the model
	describes or explains
	Explain specified examples of the
	technological applications of science

Basic	Clear	Detailed
Safety and Risk	Safety and Risk	Safety and Risk
Independently recognise controls	Explain risks and how these can be	Create a risk assessment using
for specific risks and hazards	controlled	suggested controls
<u>Apparatus</u>	<u>Apparatus</u>	Create a risk assessment
Describe how apparatus can be set	Explain how precise measurements	independently
up for practical investigations	can be taken using different pieces	<u>Apparatus</u>
Describe measurements taken by	of apparatus	Independently explain resolution of
different pieces of apparatus	Method	various apparatus
Method	Describe a full method including the	Method
Describe a method including some	three variables	Explain how your method will
of the variables	Explain choices such as intervals and	minimise errors
<u>Variables</u>	ranges of different variables	Evaluate methods and suggest
Explain the impact of not controlling	<u>Variables</u>	improvements that will affect
specific variables	Explain the impact of not controlling	accuracy
<u>Graphs</u>	specific variables	<u>Variables</u>
Draw a line graph independently	<u>Graphs</u>	Explain independent and dependent
Identify anomalies on a line graph	Draw curves of best fit	variables in terms of ranges and
Conclusion and Evaluation	Conclusion and Evaluation	intervals
Describe anomalies in terms of	Identify quantitative relationships	<u>Graphs</u>
methodology	such as direct proportionality	Read data from line or bar graphs
Suggest practical improvements to	Critically interpret data	Conclusion and Evaluation
methodology and data collection	Scientific method	Evaluate conflicting evidence
Scientific method	Evaluate methods that can be used	Justify improvements for
Decide whether or not given data	to tackle problems caused by	methodology
supports a particular theory	human impacts on the environment	Suggest how to improve reliability
Give examples of ways in which a	Suggest why the perception of risk	of data
model can be tested by observation	is very often different from the	Consider limitations in methodology
or experiment	measured risk	and data collection
Make predictions or calculate		Scientific method
quantities based on the model or		Explain that the process of peer
show its limitations		review helps to detect false claims

	and to establish a consensus about
	which claims should be regarded as
	valid
	Explain that reports of scientific
	developments in the popular media
	are not subjected to peer review
	and may be oversimplified,
	inaccurate, or biased

GO FURTHER: Skills Builder

We are also explicitly embedding transferable 'Skills Builder' skills such as problem solving, aiming high and teamwork to prepare our students for higher education and employability skills for the future. This year in History we will focus on **TEAMWORK** including group decision making and recognising the value of others. **PROBLEM SOLVING** by exploring complex problems by analysing cause and effect, and understanding through research. Furthermore, we want our students to **AIM HIGH** by setting goals, prioritising tasks and involving others.

How does our Curriculum cater for students with SEND?

Sandhill View is an inclusive academy where every child is valued and respected. We are committed to the inclusion, progress and independence of all our students, including those with SEN. We work to support our students to make progress in their learning, their emotional and social development and their independence. We actively work to support the learning and needs of all members of our community.

A child or young person has SEN if they have a learning difficulty or disability which calls for special educational provision to be made that is additional to or different from that made generally for other children or young people of the same age. (CoP 2015, p16)

Teachers are responsible for the progress of ALL students in their class and high-quality teaching is carefully planned; this is the first step in supporting students who may have SEND. All students are challenged to do their very best and all students at the Academy are expected to make at least good progress.

Specific approaches which are used within Science include:

- Seating to allow inclusion
- Scaffolding to stretch and support in all lessons
- Resources are accessible yet challenging
- Displays and visual learning tools are used where necessary
- Where appropriate, support from additional adults is planned to scaffold students learning
- Group work and discussion
- Clear teacher/student communication
- Feedback that allows students to make progress, whether written or verbal
- Independent study/homework.
- Intervention when required

How does our curriculum cater for disadvantaged students and those from minority groups?

As a school serving an area with high levels of deprivation, we work tirelessly to raise the attainment for all students and to close any gaps that exist due to social contexts. The deliberate allocation of funding and

resources has ensured that attainment gaps are closing in our drive to ensure that all pupils are equally successful when they leave the Academy. More specifically within the teaching of Science, we;

- work to identify barriers, interests and what might help each pupil make the next steps in learning.
- provide targeted support for under-performing pupils during lesson time, such as targeted questioning, live marking and seating
- ensure there are opportunities for students to make use of resources and gain homework support outside of lesson time through the use of Teams
- provide students with revision materials to reduce financial burden on families

How do we make sure that our curriculum is implemented effectively?

- The Science curriculum leader is responsible for the design and implementation of the curriculum including quality assurance of lesson resources, schemes of learning, and assessments, as well as the monitoring and evaluation of this implementation to measure the impact.
- The subject leader's monitoring is validated by senior leaders.
- Staff have regular access to professional development/training to ensure that curriculum requirements are met and subject knowledge developed.
- Effective assessment informs staff about areas in which interventions are required. These interventions are delivered during curriculum time to enhance pupils' capacity to access the full curriculum.
- Curriculum resources are selected carefully and reviewed regularly.
- Assessments are designed thoughtfully to assess student progress, long term knowledge retrieval and also to shape future learning.
- Assessments are checked for reliability within departments and across the Trust.

There are several Science staff who mark for exam boards and provide vital CPD to the rest of the department to ensure reliability of data.

Gap analysis spreadsheets are used to identify areas of development for students at KS4 to identify areas of weakness. Enhanced results analysis is also used to identify departmental priorities for development to ensure students are making the highest progress.

How do we make sure our curriculum is having the desired impact?

- Examination results analysis and evaluation.
- Half-termly assessments based upon substantive and disciplinary knowledge covered during this time.
- Lesson observations.
- Learning walks for KS3 and KS4 based upon departmental priorities.
- Work sample for each year group.
- Regular feedback from teaching staff during department meetings.
- Regular feedback from Middle Leaders during curriculum meetings.
- Pupil Surveys.
- Parental feedback.
- Staff feedback through staff voice surveys.