<u>Year 7</u>

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 Health and safety: Lab rules, using a Bunsen burner Energy 1: Energy costs and energy transfers Matter 1: Particle Model and Separating Mixtures Organisms 1: Movement and Cells 	 Energy 1: Energy costs and energy transfers Matter 1: Particle Model and Separating Mixtures Organisms 1: Movement and Cells 	 Electromagnets 1: Voltage, resistance and current Reactions 1: Metals and non-metals, acids and alkalis Ecosystems 1: Interdependence and Plant reproduction
		Skills:
Skills:	Skills:	Graph drawing
 Scientific drawing 	Reading tables	Variables in experiments
• Equipment used in a science lab	Measurements	• Equipment used in the lab
Converting units	Equipment used in the lab	
Microscopes		
Term 4	Term 5	Term 6
Knowledge:	Knowledge:	Knowledge:
• Electromagnets 1: Voltage, resistance	• Forces 1: Speed and Gravity	• Forces 1: Speed and Gravity
and current	Waves 1: Sound and Light	Waves 1: Sound and Light
 Reactions 1: Metals and non-metals, 	Genes 1: Variation and Human	Genes 1: Variation and Human
acids and alkalis	Reproduction	Reproduction
 Ecosystems 1: Interdependence and Plant reproduction 	• Earth 1 : Earth's Structure and Universe	• Earth 1: Earth's Structure and Universe
	Skills:	Skills:
Skills:	Lines of best fit	 Rounding and significant figures
Reading tables	Long answer questions	Using graphs
Graph drawing	Using numbers	Experimental write ups
Converting units		Presentation skills
		Revision techniques

<u>Year 8</u>

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 Electromagnets 2: Magnetism and electromagnets Reactions 2: Chemical Energy and Types of Reactions Ecosystems 2: Respiration and Photosynthesis 	 Electromagnets 2: Magnetism and electromagnets Reactions 2: Chemical Energy and Types of Reactions Ecosystems 2: Respiration and Photosynthesis 	 Energy 2: Work and Heating and cooling Matter 2: Periodic Table and Elements Organisms 2: Breathing and digestion
Skills:	Skills:	Skills:
MeasurementsEquipment used in a labUsing graphs	 Converting units Equipment used in a lab Scientific drawing Graph drawing 	Reading tablesVariables
Term 4	Term 5	Term 6
Knowledge:	Knowledge:	Knowledge:
 Energy 2: Work and Heating and cooling Matter 2: Periodic Table and Elements Organisms 2: Breathing and digestion Skills: Graph drawing 	 Forces 2: Contact Forces and Pressure Waves 2: Wave Effects and Wave Properties Genes 2: Evolution and Inheritance Earth 2: Climate and Earth's Resources 	 Forces 2: Contact Forces and Pressure Waves 2: Wave Effects and Wave Properties Genes 2: Evolution and Inheritance Earth 2: Climate and Earth's Resources Science project
 Rounding and significant figures 	Lines of best fit	Skills:
 Using numbers 	Reading tables	 Planning and writing up an investigation Graph drawing Presentation skills Revision techniques

<u>Year 9 Trilogy</u>

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 <u>Cell Biology</u> – cell structure, microscopy, cell division, differentiation and specialisation. <u>Rate of chemical change</u> – collision theory, factors affecting the rate of reaction, reversible reactions and equilibrium Skills: 	 <u>Cell Biology</u> (ctd) <u>Photosynthesis</u> – the photosynthesis equation, leaf structure, transpiration and translocation. <u>Organic chemistry</u> – crude oil, hydrocarbons and their properties, fractional distillation, alkanes and alkenes 	 <u>Energy</u> – types of energy, energy transfer, power, specific heat capacity and energy resources. <u>Chemical analysis</u> – pure substances, formulations, chromatography, gas tests Skills: Select and manipulate equations, use the
 Using a microscope, scientific drawing, manipulating the magnification equation and conversion between units including the use of standard form. Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations. 	 Skills: Variables, measuring rate of reaction by oxygen gas production, graph drawing and lines/curves of best fit. Use models to represent ideas, visualise and represent 2D and 3D structures, extract and interpret information from charts, graphs and tables. 	 correct SI units, use scientific theories and explanations and hypotheses, make and record observations, draw conclusions based on experimental data. Calculation of Rf values to identify a range of substances.
Term 4	Term 5	Term 6
Knowledge:	Knowledge:	Knowledge:
 <u>Electricity</u> - series and parallel circuits, resistance, I-V characteristics of components, transmitting electricity and power. <u>Atmosphere</u> – evolution of Earth's atmosphere, global climate change, reducing carbon footprints 	 <u>Electricity (ctd)</u> <u>Atmosphere (ctd)</u> <u>Particle model</u> - particle model and changes of state, density, internal energy, specific heat capacity and latent heat. <u>Health</u> - communicable and non-communicable diseases, immunity, 	 Particle model (ctd) Health (ctd) Skills: Use models, significant figures, calculate means, calculate areas of triangles and rectangles, surface areas and volumes of
Skills:	making new drugs, Skills:	cubes, calculate the density of regular and irregular objects.

•	Select and manipulate equations, use the	٠	Use models, significant figures, calculate	•	Investigate the effect of antiseptics or
	correct SI units, identify patterns/trends		means, calculate areas of triangles and		antibiotics on bacterial growth using agar
	and draw conclusions		rectangles, surface areas and volumes of		plates and measuring zones of inhibition.
•	Use ratios, fractions and percentages,		cubes, calculate the density of regular		
	translate information between numerical		and irregular objects.		
	and graphical form.	•	Investigate the effect of antiseptics or		
			antibiotics on bacterial growth using agar		
			plates and measuring zones of inhibition.		

Year 9 Triple

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 <u>Biology</u>: <u>Cell Biology</u> – cell structure, microscopy, cell division, differentiation and specialisation. <u>Chemistry</u>: <u>Atomic structure</u> – atoms, formulae equations, development of the periodic table and groups in the table. <u>Physics</u>: <u>Energy</u> – types of energy, energy transfer, power, specific heat capacity and energy resources. 	 <u>Biology: Cell Biology</u> (ctd) and <u>Photosynthesis</u> – the photosynthesis equation, leaf structure, transpiration and translocation. <u>Chemistry: Atomic structure (ctd)</u> and <u>Energy changes</u> – endo and exothermic reactions, reaction profiles <u>Physics: Energy (ctd)</u> and <u>Electricity</u> - series and parallel circuits, resistance, I-V characteristics of components, transmitting electricity and power. 	 <u>Biology: Photosynthesis</u> (ctd) <u>Chemistry: Energy changes (ctd)</u> and <u>Structures, bonding and the properties of</u> <u>matter</u> - ionic, covalent and metallic bonding and the properties of these compounds. <u>Physics: Electricity</u> (ctd)
 Skills: Using a microscope, scientific drawing, manipulating the magnification equation and conversion between units including the use of standard form. Drawing electronic configurations, making estimates and using standard form. Select and manipulate equations, use the correct SI units, use scientific theories and explanations and hypotheses, make and record observations, draw conclusions based on experimental data. 	 Skills: Variables, measuring rate of reaction by oxygen gas production, graph drawing and lines/curves of best fit. Make and record observations and measurements using a range of apparatus and methods, evaluate methods and suggest possible improvements and further investigations, recognise and use expressions in decimal form. Select and manipulate equations, use the correct SI units, identify patterns/trends and draw conclusions 	 Skills: Variables, measuring rate of reaction by oxygen gas production, graph drawing and lines/curves of best fit. Using models to represent ideas, orders of magnitude, visualising and representing 2D and 3D structures. Select and manipulate equations, use the correct SI units, identify patterns/trends and draw conclusions.

Term 4	Term 5	Term 6
Knowledge:	Knowledge:	Knowledge:
 <u>Biology: Health</u> – communicable and non-communicable diseases, immunity, making new drugs, plant defences, monoclonal antibodies <u>Chemistry: Structures, bonding and the</u> <u>properties of matter</u> (ctd) <u>Physics: Particle model of matter</u> – particle model and changes of state, density, internal energy, specific heat capacity and latent heat. 	 <u>Biology: Health (ctd)</u> <u>Moving and changing materials</u> – diffusion, osmosis and active transport, the digestive, circulatory and gas exchange systems. <u>Chemistry: Quantitative Chemistry</u> – relative formula mass, mass changes in reactions, uncertainty, moles and concentrations of solutions <u>Physics: Particle model of matter</u> (ctd) 	 <u>Biology: Moving and changing materials</u> (ctd) <u>Chemistry: Chemical changes</u> – reactivity series, making salts, electrolysis, oxidation and reduction <u>Physics: Atomic structure</u> – radioactive decay, half-life, radiation and its hazards Skills:
 Skills: Investigate the effect of antiseptics or antibiotics on bacterial growth using agar plates and measuring zones of inhibition. Using models to represent ideas, orders of magnitude, visualising and representing 2D and 3D structures. Use models, significant figures, calculate means, calculate areas of triangles and rectangles, surface areas and volumes of cubes, calculate the density of regular and irregular objects. 	 Skills: Use qualitative reagents to test for a range of carbohydrates, lipids and proteins, use scientific theories and explanations and hypotheses, make and record observations, graph drawing, calculate rate. Changing the subject of an equation, calculations of moles, using moles to balance equations. Use models, significant figures, calculate means, calculate areas of triangles and rectangles, surface areas and volumes of cubes, calculate the density of regular and irregular objects. 	 Ose qualitative reagents to test for a range of carbohydrates, lipids and proteins, use scientific theories and explanations and hypotheses, make and record observations, graph drawing, calculate rate. Preparation of a salt, electrolysis of aqueous solutions. Drawing and interpreting graphs, using ratios and proportional reasoning.

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 Particle model of matter – particle model and changes of state, density, internal energy, specific heat capacity and latent heat. Energy changes – endo and exothermic reactions, reaction profiles Chemical changes – reactivity series, making salts, electrolysis, oxidation and reduction Skills: Use models, significant figures, calculate means, calculate areas of triangles and rectangles, surface areas and volumes of cubes, calculate the density of regular and irregular objects. Make and record observations and measurements using a range of apparatus and methods, evaluate methods and suggest possible improvements and further investigations. Preparation of a salt, electrolysis of aqueous solutions, 	 Energy changes (ctd) Chemical changes (ctd) Skills: Make and record observations and measurements using a range of apparatus and methods, evaluate methods and suggest possible improvements and further investigations. Extracting and interpreting information, analysing and evaluating data, sampling. Select and manipulate equations, use the correct SI units, make and record observations, draw conclusions based on experimental data, graph drawing and lines/curves of best fit, proportionality. 	 Forces – Speed, acceleration, Newton's laws of motion, momentum, road safety and energy in springs Atomic structure – radioactive decay, half-life, radiation and its hazards Health – communicable and non-communicable diseases, immunity, making new drugs Skills: Select and manipulate equations, use the correct SI units, make and record observations, draw conclusions based on experimental data, graph drawing and lines/curves of best fit, proportionality. Drawing and interpreting graphs, using ratios and proportional reasoning.
Term 4	Term 5	Term 6
 Knowledge: <u>Health</u> (ctd) <u>Genetics</u> – DNA, human genome project, cell division, patterns of inheritance, genetic disorders <u>Rate of chemical change</u> – collision theory, factors affecting the rate of reaction, reversible reactions and equilibrium 	 Knowledge: <u>Genetics</u> (ctd) <u>Variation and evolution</u> – variation, classification, evolution, natural selection, genetic engineering, selective breeding <u>Rate of chemical change</u> (ctd) Skills: 	 Knowledge: <u>Variation and evolution</u> (ctd) <u>Organic chemistry</u> – crude oil, hydrocarbons and their properties, fractional distillation, alkanes and alkenes Skills:
Skills:		

 Interpreting genetic crosses,	 Interpreting genetic crosses,	 Extract and interpret information from
construction of Punnett squares,	construction of Punnett squares,	charts, graphs and tables, understand
fractions, ratio, proportion and	fractions, ratio, proportion and	how scientific methods and theories
probability.	probability.	develop over time.
 Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations. 	 Extract and interpret information from charts, graphs and tables, understand how scientific methods and theories develop over time. Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations. 	 Use models to represent ideas, visualise and represent 2D and 3D structures, extract and interpret information from charts, graphs and tables.

Year 10 Triple

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 <u>Biology: Moving and changing materials</u> diffusion, osmosis and active transport, the digestive, circulatory and gas exchange systems. <u>Chemistry: Chemical changes</u> – reactivity series, making salts, electrolysis, oxidation and reduction <u>Physics: Atomic structure</u> – radioactive decay, half-life, radiation and its hazards 	 <u>Biology: Health</u> (ctd) and <u>Genetics</u> – DNA, human genome project, cell division, patterns of inheritance, genetic disorders <u>Chemistry: Chemical changes</u> (ctd) <u>Physics: Forces</u> – Speed, acceleration, Newton's laws of motion, momentum, road safety and energy in springs 	 <u>Biology: Genetics</u> (ctd) <u>Chemistry: Energy changes</u> – endo and exothermic reactions, reaction profiles <u>Physics: Forces</u> (ctd)
 Skills: Use qualitative reagents to test for a range of carbohydrates, lipids and proteins, use scientific theories and explanations and hypotheses, make and record observations, graph drawing, calculate rate. Preparation of a salt, electrolysis of aqueous solutions, carry out titrations. 	 Skills: Interpreting genetic crosses, construction of Punnett squares, fractions, ratio, proportion and probability. Preparation of a salt, electrolysis of aqueous solutions, carry out titrations. Select and manipulate equations, use the correct SI units, make and record observations, draw conclusions based on 	 Skills: Interpreting genetic crosses, construction of Punnett squares, fractions, ratio, proportion and probability. Make and record observations and measurements using a range of apparatus and methods, evaluate methods and suggest possible

		lines/curves of best fit, proportionality.
 <u>Biology: Variation and evolution</u> - variation, classification, evolution, natural selection, genetic engineering, selective breeding <u>Chemistry: Rate of chemical change</u> – collision theory, factors affecting the rate of reaction, reversible reactions and equilibrium <u>Physics: Waves</u> – types of waves, 	 <u>Variation and evolution</u> (ctd) <u>Rate of chemical change</u> (ctd) <u>Waves</u> (ctd) Skills: Extract and interpret information from charts, graphs and tables, understand how scientific methods and theories develop over time. 	 <u>Ecology</u> – biotic and abiotic factors, transfer of energy, cycles, maintaining biodiversity <u>Organic chemistry</u> - hydrocarbons and their properties, fractional distillation, alkanes and alkenes, alcohols, carboxylic acids <u>Electromagnetism</u> – magnets, magnetic fields, electromagnets and their uses,
 reflection, refraction, electromagnetic spectrum, lenses, images and magnification Skills: Extract and interpret information from charts, graphs and tables, understand how scientific methods and theories develop over time. Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations. Manipulation of equations, SI units, measuring the wavelength frequency 	 Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations. Manipulation of equations, SI units, measuring the wavelength, frequency and speed of waves. 	 transformers Skills: Safe use of microorganisms, measurement of rate of decay by pH change, calculate rate changes. Use models to represent ideas, visualise and represent 2D and 3D structures, extract and interpret information from charts, graphs and tables. Manipulation of equations and evaluating the impact of different technological advancements.

<u>Year 11 Trilogy</u>

Term 1	Term 2	Term 3
Knowledge:	Knowledge:	Knowledge:
 <u>Rate of chemical change</u> – collision theory, factors affecting the rate of reaction, reversible reactions and equilibrium <u>Atmosphere</u> – evolution of Earth's atmosphere, global climate change, reducing carbon footprints <u>Sustainable development</u> – potable water, metal extraction, life cycle assessments 	 <u>Chemical analysis</u> – pure substances, formulations, chromatography, gas tests <u>Waves</u> – types of waves, reflection, electromagnetic spectrum <u>Coordination and control</u> – homeostasis, the nervous and endocrine system, diabetes, human reproduction and IVF, contraception Skills: Plan an investigation to measure 	 <u>Electromagnetism</u> – magnets, magnetic fields, electromagnets and their uses, transformers <u>Ecology</u> – ecosystems, energy transfers, carbon and water cycles, human impact Skills: Extract and interpret information from charts, graphs and tables. Sampling techniques Manipulation of equations and
 Skills: Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations. Use ratios, fractions and percentages. Evaluate methods and suggest improvements, translate information between numerical and graphical form. 	 reaction time, make and record observations, draw conclusions. Calculation of Rf values to identify a range of substances. Manipulation of equations, SI units, measuring the wavelength, frequency and speed of waves. 	evaluating the impact of different technological advancements.
Term 4	Term 5	Term 6
Knowledge: • <u>Electromagnetism (ctd)</u> • <u>Ecology (</u> ctd)	Exam preparation	Examinations
 Skills: Manipulation of equations and evaluating the impact of different technological advancements. Extract and interpret information from charts, graphs and tables. Sampling 		

Year 11 Triple

Term 1

Knowledge:

- <u>Biology: Genetics</u> DNA, human genome project, cell division, patterns of inheritance, genetic disorders
- <u>Chemistry (11X1): Atmosphere</u> evolution of Earth's atmosphere, global climate change, reducing carbon footprints
- <u>Chemistry (11Y1): Rate of chemical</u> <u>change</u> – collision theory, factors affecting the rate of reaction, reversible reactions and equilibrium
- <u>Physics: Forces</u> Speed, acceleration, Newton's laws of motion, momentum, road safety and energy in springs

Skills:

- Interpreting genetic crosses, construction of Punnett squares, fractions, ratio, proportion and probability.
- Use ratios, fractions and percentages, translate information between numerical and graphical form.
- Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations.
- Select and manipulate equations, use the correct SI units, make and record observations, draw conclusions based on experimental data, graph drawing and lines/curves of best fit, proportionality.

Term 2

Knowledge:

- <u>Biology: Variation and evolution</u> variation, classification, evolution, natural selection, genetic engineering, selective breeding
- <u>Chemistry (11X1): Rate of chemical</u> <u>change</u> – collision theory, factors affecting the rate of reaction, reversible reactions and equilibrium
- <u>Chemistry (11Y1): Atmosphere</u> evolution of Earth's atmosphere, global climate change, reducing carbon footprints
- <u>Physics: Forces</u> (ctd)

Skills:

- Extract and interpret information from charts, graphs and tables, understand how scientific methods and theories develop over time.
- Measurement and calculation of rate, graph drawing, using tangents to measure the rate of change, molar calculations.
- Use ratios, fractions and percentages, translate information between numerical and graphical form.
- Select and manipulate equations, use the correct SI units, make and record observations, draw conclusions based on experimental data, graph drawing and lines/curves of best fit, proportionality.

Term 3

Knowledge:

- <u>Biology: Coordination and control</u> homeostasis, the nervous and endocrine system, eye defects, diabetes, the kidney, human reproduction and IVF, contraception, plant hormones.
- <u>Chemistry: Organic chemistry</u> hydrocarbons and their properties, fractional distillation, alkanes and alkenes, alcohols, carboxylic acids
- <u>Physics: Electromagnetism</u> magnets, magnetic fields, electromagnets and their uses, transformers

Skills:

- Plan investigations to measure reaction time and investigate plant tropisms, make and record observations, draw conclusions.
- Use models to represent ideas, visualise and represent 2D and 3D structures, extract and interpret information from charts, graphs and tables.
- Manipulation of equations and evaluating the impact of different technological advancements.

Term 4		Term 5	Term 6
Knowledge:			
•	Biology: Coordination and control (ctd)	Exam preparation	Examinations
•	<u> Chemistry: Chemical analysis</u> – pure		
9	substances, formulations,		
(chromatography, gas tests and		
2	Sustainable development – potable		
,	water, metal extraction, life cycle		
i	assessments		
•	Physics: Space – the solar system, life		
(cycle of stars, red shift		
Skills:			
•	Extract and interpret information from		
(charts, graphs and tables.		
• (Calculation of Rf values to identify a		
1	range of substances, flame tests to		
i	identify ions		
•	Evaluate methods and suggest		
i	improvements, translate information		
I	between numerical and graphical form.		
•	Using scale and standard form		