

Key Stage 3 Long Term Planning

Year 7 2021-2022 INTENT: To develop and build upon pupils' KS2 knowledge to produce well rounded, literate scientists, with a broad range of knowledge and skills.

Faculty Area:

Year 7	Transition	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Knowledge	Safety, Lab equipment, Bunsen Burner, Method writing, Carrying out an experiment, analysing results	<p>1.5 Matter</p> <ul style="list-style-type: none"> •Using particles to explain matter •Understanding solids and gases •Exploring diffusion •Explaining changes of state •Separating mixtures •Exploring solutions •Understanding distillation •Exploring chromatography <p>1.8 Organisms</p> <ul style="list-style-type: none"> •Exploring the human skeleton •Understanding the role of joints and muscles •Examining interacting muscles •Exploring problems with the skeletal system •Understanding organisation of organisms •Describing animal and plant cells •Understanding adaptations of cells •Exploring cells •Understanding unicellular organisms 	<p>1.3 Energy</p> <ul style="list-style-type: none"> •Looking at the cost of energy use in the home •Using electricity responsibly •Understanding energy transfer by fuels and food •Comparing rates of energy transfers •Getting the electricity we need •Energy stores and transfers •Exploring energy transfers •Understanding potential energy and kinetic energy •Understanding elastic energy <p>1.6 Reactions</p> <ul style="list-style-type: none"> •Using metals and non-metals •Exploring the reactions of metals with acids •Understanding displacement reactions •Understanding oxidation reactions •Exploring the reactions of metals with acids •Exploring acids •Exploring alkalis •Using indicators •Exploring neutralisation •Investigating neutralization 	<p>1.6 Reactions</p> <ul style="list-style-type: none"> •Using metals and non-metals •Exploring the reactions of metals with acids •Understanding displacement reactions •Understanding oxidation reactions •Exploring the reactions of metals with acids •Exploring acids •Exploring alkalis •Using indicators •Exploring neutralisation •Investigating neutralization <p>1.9 Ecosystems</p> <ul style="list-style-type: none"> •Understanding food webs •Understanding the effects of toxins in the environment •Exploring the importance of insects •Exploring ecological balance •Exploring flowering plants •Exploring fertilisation •Understanding how seeds are dispersed •Understanding how fruits disperse seeds 	<p>1.1 Forces-</p> <ul style="list-style-type: none"> •Understanding Speed •Describing journeys with distance-time graphs •Exploring journeys on distance-time graphs •Investigating the motion of a car on a ramp •Understanding relative motion •Understanding forces •Understanding gravitational fields •Understanding mass and weight •Understanding gravity <p>1.2 Electromagnets</p> <ul style="list-style-type: none"> •Describing electric circuits •Understanding energy in circuits •Explaining resistance •Describing series and parallel circuits •Comparing series and parallel circuits •Explaining resistance •Describing series and parallel circuits •Comparing series and parallel circuits •Investigating static charge •Explaining static charge •Understanding electric fields 	<p>1.7 Earth</p> <ul style="list-style-type: none"> •Understanding the structure of the Earth •Exploring igneous rocks •Exploring sedimentary rocks •Exploring metamorphic rocks •Understanding the rock cycle •Describing stars and galaxies •Explaining the effects of the Earth's motion •Exploring our neighbours in the Universe •Using models in science 	<p>1.10 Genes</p> <ul style="list-style-type: none"> •Looking at variation •Exploring causes of variation •Considering the importance of variation •Understanding the female reproductive system and fertility •Understanding the male reproductive system and fertilisation •Learning how a foetus develops •Understanding factors affecting a developing foetus •Communicating ideas about smoking in pregnancy

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				<p>1.4 Waves</p> <ul style="list-style-type: none"> •Exploring sound •Describing sound •Hearing sounds •Understanding how sound travels through materials •Learning about the reflection and •absorption of sound •Exploring properties of light •Exploring reflection •Exploring refraction •Seeing clearly •Exploring coloured light 			
Skills	<p>Working scientifically</p> <p>Using Bunsen Burners to heat liquids, Draw conclusions, construct explanations, analyse patterns, estimate risks, present data, devise questions, plan methods</p>	<p>Working scientifically:</p> <p>1.5 Matter Review theories, construct explanations, analyse patterns, examine consequences, plan variables, review theories, collect data</p> <p>1.8 Organisms Construct explanations, analyse patterns, draw conclusions, communicate ideas, examine consequences, collect data</p>	<p>Working scientifically:</p> <p>1.3 Energy Examine consequences, draw conclusions, present data, estimate risks, review theories</p> <p>1.6 Reactions Draw conclusions, construct explanations, analyse patterns, estimate risks, present data, devise questions</p>	<p>Working scientifically:</p> <p>1.6 Reactions Draw conclusions, construct explanations, analyse patterns, estimate risks, present data, devise questions</p> <p>1.9 Ecosystems Examine consequences, review theories, estimate risks, draw conclusions, construct explanations, plan variables, test hypotheses, justify opinions</p>	<p>Working scientifically:</p> <p>1.7 Earth Construct explanations, analyse patterns, construct explanations, construct explanations, analyse patterns, review theories, examine consequences, interrogate sources Review theories</p>	<p>Working scientifically:</p> <p>1.1-Forces Construct explanations; Present data scientifically; Analyse patterns; Collect data</p> <p>1.2-Electromagnets Present data; Analyse patterns; Construct explanations; Draw conclusions; Estimate risks</p>	<p>Working scientifically:</p> <p>1.10 Genes Devise questions, examine consequences, communicate ideas, construct explanations, review theories, interrogate sources</p>
Connections to previous learning	Whole school transition from Primary to Secondary.	1.5 Matter KS2-States of matter/Reversible changes such as ice melting and freezing/dissolving and	1.3 Energy KS2-Materials can change/Living things need energy/Objects can move in various ways/Light and sound	1.6 Reactions KS2-grouping of metals based on properties/chemical changes to make new	1.7 Earth KS2-rocks can be grouped/ fossils/ the sun, earth and moon as spherical objects/rotation of the	1.1-Forces KS2-Movement/ Contact Forces/Gravity	1.10 Genes KS2-Variations in living things/animals and plants/

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		solubility such as dissolving salt or sugar 1.8 Organisms KS2-Movement and the skeleton/body systems such as the digestive system	travel as waves/Electricity can do useful work 1.6 Reactions KS2-grouping of metals based on properties/chemical changes to make new substances/burning wood and wax	substances/burning wood and wax 1.9 Ecosystems KS2-The environment and food chains/reproduction in plants	earth on its axis	(cells/wires/bulbs). Changing voltage	
Assessment	Practical assessments- safe use of the Bunsen Burner Written assessment – writing a method	End of topic tests •1.5	End of topic tests •1.8 (mixed test to include 25% marks from topic 1.5) •1.3 (mixed test to include 33% marks from topic 1.8/1.5)	End of topic tests •1.6 (mixed test to include 33% marks from topic 1.8/1.3)	End of topic tests •1.9 (mixed test to include 33% marks from topic 1.6/1.5) •1.1 (mixed test to include 33% marks from topic 1.9/1.6)	End of topic tests •1.2 (mixed test to include 33% marks from topic 1.1/1.8)	End of topic tests •1.7 (mixed test to include 33% marks from topic 1.9/1.6) •1.10 (mixed test to include 33% marks from topic 1.7/1.3) End of Year Exam Covering all units studied
Homework	Weekly homework selected from homework packs and tailored to individuals via weekly PLC self-assessments						
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)
Literacy	Opportunities for reading out in class, discussion and giving verbal feedback, Written opportunities include planning and analysing an investigation	1.5 Matter • apply models to develop explanations • develop explanations using ideas and evidence • create key or flow diagram • explain how models can be adapted to fit new situations • incorporate features such as comparisons and risks in written accounts	1.8 Organisms • use writing to construct justified suggestions • speculate upon consequences of a situation • develop explanations using ideas and evidence • develop explanations using ideas and evidence make comparisons and suggest improvements • summarise key ideas by tabulation 1.3 Energy • extract evidence to support the construction	1.6 Reactions • incorporate key information in descriptions and explanations • express reactions as word equations • draw conclusions from experimental evidence • summarise key ideas about reactions • develop explanations using ideas and evidence • identifying and summarizing common features • make comparisons	1.9 Ecosystems •develop explanations using ideas from diagrams •develop explanations using ideas and evidence •summarise and evaluate key points •describe how a model can be manipulated and what this shows •summarise advantages and disadvantages •tabulate key information plan investigation, draw conclusions and	1.2-Electromagnets • Use analogies to understand phenomena • Use comparisons and analogies to construct explanations • Apply analogies to construct explanations • Describe disadvantages with a presented solution • Identify and describe evidence • Construct descriptions and explanations	1.7 Earth •interpret diagrams to develop explanations •make and describe comparisons •accurate use of key terminology •use ideas and evidence to develop explanations •apply ideas and evidence to develop explanations •evaluate a range of models •using appropriate ideas and terminology 1.10 Genes •summarise key points using ideas and

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			<p>of explanations</p> <ul style="list-style-type: none"> • extract information from text to use • identify and suggest various solutions • explain differences and compare and contrast situations • justify ideas and suggest how ideas can be presented persuasively • critique application of an analogy • translate between written and diagrammatically presented information • interpret diagrams to develop explanations • devise describe investigation 	<p>and identify advantages</p> <ul style="list-style-type: none"> • summarise key features of an experiment in writing • critically evaluate a procedure 	<p>analyse outcomes</p> <ul style="list-style-type: none"> • account for management of variables; use ideas from tables to support assertions • suggest possible explanation in writing <p>1.1-Forces</p> <ul style="list-style-type: none"> • Develop explanations considering several factors • Evaluate the benefits of natural and artificial designs. • Develop explanations from observations and peer assess other explanations • Use key scientific terminology to develop explanations • Use sentence stems to link scientific ideas and evidence 		<p>evidence</p> <ul style="list-style-type: none"> • develop explanations using ideas and evidence • structure writing to present solutions to problems • describe features and identify crucial differences • summarise key points • comment on specified features of research reports • present ideas and assertions with supporting evidence
Numeracy	<p>Drawing a graph, measuring using different equipment, extract and use data from tables</p>	<p>1.5 Matter</p> <ul style="list-style-type: none"> • interpret diagrams of three dimensional phenomena • understand and apply numerical scales • interpret diagrams of three dimensional phenomena • understand and apply concepts such as 'concentration gradient' • relate numerical scales to ideas such as melting and boiling points • interpret graphs • relate numerical scales to ideas such as boiling points • relate features on a chromatogram to relative solubility 	<p>1.3 Energy</p> <ul style="list-style-type: none"> • extract and interpret data • use formulae to calculate solutions • extract and use data to perform calculations • extract and use data from tables • understand how models can be used to represent changing quantities • communicate numerical information diagrammatically • identify increasing and decreasing quantities <p>1.6 Reactions</p> <ul style="list-style-type: none"> • relate word equations to rearrangement of particles in reactions 	<p>1.6 Reactions</p> <ul style="list-style-type: none"> • relate word equations to rearrangement of particles in reactions • construct and interpret grids • tabulating reactions between various combinations of reactants record and • process data relating to mass change • relate terms such as dilute and concentrated to proportions of particles • relate numerical scales to pH • relate word 	<p>1.1 Forces</p> <ul style="list-style-type: none"> • Use units correctly • Gather data • Construct and interpret line graphs • Use formulae to perform calculations and understand units <p>1.2 Electromagnets</p> <ul style="list-style-type: none"> • use symbols to represent physical objects • identify trends and patterns • use formulae to perform calculations • identify patterns in data • identify trends in data • identify and recognise factors 	<p>1.7 Earth</p> <ul style="list-style-type: none"> • understand relationships between variables • understanding graphical representations • interpret graphs • understand diagrams representing three dimensional phenomena • using large numbers interpret diagrams of three dimensional phenomena 	<p>1.10 Genes</p> <ul style="list-style-type: none"> • interpret graphs • interpret timelines • understand data in research summary

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		<p>1.8 Organisms</p> <ul style="list-style-type: none"> •relate position of muscle to direction of force applied •relate drawings to three dimensional phenomena •understanding scale and magnification 	<ul style="list-style-type: none"> •construct and interpret grids •tabulating reactions between various combinations of reactants record and •process data relating to mass change •relate terms such as dilute and concentrated to proportions of particles •relate numerical scales to pH •relate word equations to rearrangements of particles in a reaction •evaluate quality of data using concepts such as repeatability 	<p>equations to rearrangements of particles in a reaction</p> <ul style="list-style-type: none"> •evaluate quality of data using concepts such as repeatability <p>1.9 Ecosystems</p> <ul style="list-style-type: none"> •understand and interpret network diagrams •understand concentrations and accumulation. •plot and interpret graphs •identify variables and select appropriate values to use; gather data. extract data to identify patterns •interpret information from graphs 	<ul style="list-style-type: none"> • use ideas about positive and negative values • use positive and negative values 		
<p>CIAG Links will be made to various careers in lessons via PowerPoints</p>	<p>HT1: The 2013 Institute of Physics Schools Lecture - Defying Gravity: Laura Thomas, an independent science communicator with a background in astrophysics, talks about the physics of space flight. She explains how studying physics and mathematics could help towards a career in space.</p>			<p><u>HT4:</u> All year groups to take part in NCW STEM lessons – where can science take you?</p>		<p>HT6: Year 7: Working scientifically – lesson covering STEM skills and specific links made to careers that use these</p>	

Key Stage 3 Long Term Planning

Year 8 2021-2022 INTENT:

Faculty Area: To develop and build upon pupils' knowledge in Yr 7 to produce well rounded, literate scientists, with a broad range of knowledge and skills.

Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Knowledge	<p>1.4 +2.4 Waves</p> <ul style="list-style-type: none"> •Exploring sound •Describing sound •Hearing sounds •Understanding how sound travels through materials •Learning about the reflection and absorption of sound •Exploring properties of light •Exploring reflection •Exploring refraction •Seeing clearly •Exploring coloured light •Sound systems •Exploring light •Comparing transverse and longitudinal waves •Exploring waves <p>2.5 Matter</p> <ul style="list-style-type: none"> •Looking at the Periodic Table of elements •Exploring metals in the periodic table •Exploring non-metals in the periodic table •Analysing wider patterns within the periodic table •Combining elements •Comparing elements and compounds •Exploring polymers •Exploring ceramics and composites 	<p>2.8 Organisms</p> <ul style="list-style-type: none"> •Understanding how we breathe •Measuring breathing •Explaining gas exchange in humans •Exploring the effects of disease and lifestyle •Exploring a healthy diet •Understanding the effects of an unbalanced diet •Understanding the human digestive system •Understanding the roles of the digestive organs <p>2.3 Energy</p> <ul style="list-style-type: none"> •Doing work •Making work easier •Explaining thermal energy •Heating •How to stop energy from travelling •Energy and temperature 	<p>2.6 Reactions</p> <ul style="list-style-type: none"> •Understanding exothermic reactions •Comparing endothermic and exothermic changes •Investigating endothermic reactions •Explaining the use of catalysts •Exploring combustion •Exploring the use of fuels •Understanding thermal decomposition •Explaining changes 	<p>2.9 Ecosystems</p> <ul style="list-style-type: none"> •Understanding aerobic respiration •Exploring respiration in sport •Understanding anaerobic respiration •Investigating fermentation •Comparing aerobic and anaerobic respiration •Exploring how plants make food •Looking at leaves •Exploring the movement of water and minerals in plants •Investigating the importance of minerals to plants •Investigating photosynthesis <p>2.1 Forces-</p> <ul style="list-style-type: none"> •Analysing equilibrium •What a drag! •Understanding stretch and compression •Investigating Hooke's Law •Exploring pressure on a solid surface •Exploring pressure in a fluid •Calculating 	<p>2.2 Electromagnets</p> <ul style="list-style-type: none"> •Forces and fields •Using ideas about fields •Investigating electromagnetism •Using electromagnets •Investigating strength of electromagnets <p>2.7 Earth</p> <ul style="list-style-type: none"> •Understanding our atmosphere •Understanding how carbon is recycled •Exploring how humans affect the carbon cycle •Understanding global warming •Exploring damage to the Earth's resources •Considering the importance of recycling •How to extract metals 	<p>2.10 Genes</p> <ul style="list-style-type: none"> •Explaining natural selection •Understanding the importance of biodiversity •Explaining extinction •Understanding the nature of genetic material •Exploring the role of chromosomes •Understanding variation •Modelling inheritance

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				pressure •Explaining sinking and floating		
Skills	<p>Working scientifically:</p> <p>1.4 +2.4 Waves Construct explanations, analyse patterns, examine consequences, construct explanations, collect data, draw conclusions</p> <p>2.5 Matter Review theories, construct explanations, analyse patterns, examine consequences, plan variables, review theories, collect data</p>	<p>Working scientifically:</p> <p>2.3 Energy Examine consequences, draw conclusions, present data, estimate risks, review theories, construct explanations, test hypotheses and analyse patterns</p> <p>2.8 Organisms Draw conclusions, plan variables, communicate ideas, review theories and critique claims</p>	<p>Working scientifically:</p> <p>2.6 Reactions Draw conclusions, construct explanations, analyse patterns, estimate risks, present data, devise questions, collect data, discuss limitations and test hypotheses</p>	<p>Working scientifically:</p> <p>2.9 Ecosystems Construct explanations, communicate ideas, discuss limitations, estimate risks, collect data, test hypotheses and plan variables</p> <p>2.1-Forces Construct explanations; Present data scientifically; Analyse patterns; Collect data</p>	<p>Working scientifically:</p> <p>2.2-Electromagnets Present data; Analyse patterns; Construct explanations; Draw conclusions; Estimate risks; devise questions; test hypotheses; collect data and plan variables</p> <p>2.7 Earth Construct explanations, analyse patterns, construct explanations, analyse patterns, review theories, examine consequences, interrogate sources Review theories</p>	<p>Working scientifically:</p> <p>2.10 Genes Present data, review theories, communicate ideas, examine consequences, construct explanations and analyse patterns</p>
Connections to previous learning	<p>1.4+2.4 Waves KS2-Different sounds can be made/sounds are vibrations/light travels in straight lines/light reflects into the eye</p> <p>2.5 Matter Yr7-Materials make up different substances and have different properties</p> <p>2.1-Forces Yr7-Forces/Friction and resistance/Floating and sinking/resultant forces</p>	<p>2.8 Organisms Yr7-Breathing and gas exchange/diet and nutrition/digestion</p> <p>2.3 Energy Yr7-energy stores and transfer/using simple machines/thermal energy</p>	<p>2.6 Reactions Yr7-changes in chemical reactions/combustion/physical and chemical changes/reversible and non-reversible changes</p>	<p>2.9 Ecosystems Yr7-Cells and organelles/plants and their need for water and nutrients/photosynthesis (intro)</p>	<p>2.2-Electromagnets Yr7-Magnetic fields/magnetic attraction and repulsion/electrical circuits and components</p> <p>2.7 Earth Yr7-changing earth and cycles of nature/using and re-using the earth's resources</p>	<p>2.10 Genes Yr7-evolution arising from environmental changes/variation over time/inheritance and offspring</p>
Assessment	<p>End of topic tests</p> <ul style="list-style-type: none"> •1.4/2.4 •2.5 (mixed test to include 25% marks from topic 2.4) 	<p>End of topic tests</p> <ul style="list-style-type: none"> •2.8 (mixed test to include 33% marks from topic 2.4/2.5) 	<p>End of topic tests</p> <ul style="list-style-type: none"> •2.6 (mixed test to include 33% marks from topic 2.8/3) 	<p>End of topic tests</p> <ul style="list-style-type: none"> •2.9 (mixed test to include 33% marks from topic 2.4/3) 	<p>End of topic tests</p> <ul style="list-style-type: none"> •2.2 (mixed test to include 33% marks from topic 2.5/6) 	<p>End of topic tests</p> <ul style="list-style-type: none"> •2.10 (mixed test to include 33% marks from topic 2.8/1.9)

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		•2.3 (mixed test to include 33% marks from topic 2.8/2.5)			•2.7 (mixed test to include 33% marks from topic 2.2/2.9)	End of Year Exam Covering all units studied
Homework	Weekly homework selected from homework packs and tailored to individuals via weekly PLC self-assessments					
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular		TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)	TBC (Sun alliance)
Literacy	<p>1.4+2.4 Waves</p> <ul style="list-style-type: none"> • use information to construct proposals • interpret diagrams to develop explanations • extract information from diagrams • interpret diagrams to develop explanations • Develop explanations of familiar contexts using ideas and evidence. • Develop explanations using key terminology • Extract information to support explanations • Translate information from diagrams to written form <p>2.5 Matter</p> <ul style="list-style-type: none"> • apply models to develop explanations • develop explanations using ideas and evidence • create key or flow diagram • explain how models can be adapted to fit new situations • incorporate features such as comparisons and risks in written accounts 	<p>2.3 Energy</p> <ul style="list-style-type: none"> • extract evidence to support the construction of explanations • extract information from text to use • identify and suggest various solutions • critique application of an analogy • translate between written and diagrammatically presented information • interpret diagrams to develop explanations • devise describe investigation • Describe the relationship between factors in a formula • Plan investigations to test hypotheses construction of explanations • Describe relationships from graphical information <p>2.8 Organisms</p> <ul style="list-style-type: none"> • Analyse and evaluate a model • Identify bias in reporting and explain its role in influencing our ideas about smoking 	<p>2.6 Reactions</p> <ul style="list-style-type: none"> • Devise and refine questions from observations • instruction writing • construct conclusions to answer scientific questions • Use evidence to evaluate an experimental method • Explore the differences between a description and explanation • Construct explanations using evidence from observations 	<p>2.1-Forces</p> <ul style="list-style-type: none"> • Develop explanations considering several factors • Evaluate the benefits of natural and artificial designs. • Develop explanations from observations and peer assess other explanations • Use key scientific terminology to develop explanations • Use sentence stems to link scientific ideas and evidence • Describe relationships between factors and link these to observations • Describe in words the relationships shown in formulae <p>2.9 Ecosystems</p> <ul style="list-style-type: none"> • Construct justified suggestions • Make written comparisons • Write instructions and give feedback using identified success criteria 	<p>2.2-Electromagnets</p> <ul style="list-style-type: none"> • Use analogies to understand phenomena • Use comparisons and analogies to construct explanations • Apply analogies to construct explanations • Describe disadvantages with a presented solution • Identify and describe evidence • Construct descriptions and explanations <p>2.7 Earth</p> <ul style="list-style-type: none"> • Suggest how the atmosphere has changed over time and the consequences of the changes • Translate diagrammatical information into text • Express opinions supported by evidence • Present evidence to support a theory • Summarise key points from text through research 	<p>2.10 Genes</p> <ul style="list-style-type: none"> • Develop explanations to support observations • Present an idea using persuasive writing • Suggest how ideas and evidence can be used persuasively • Assess the influence of scientists on each other • Collect valid information through research • Explore and explain differences

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		<ul style="list-style-type: none"> • Justify choices through verbal discussions • Evaluate a model and consider what the model can show us • Apply scientific ideas to relate structure to function • Use ideas about science to relate structure to function 		<ul style="list-style-type: none"> • construct and interpret graphs • Identify hazards and suggest measures to control risk • Use scientific ideas to evaluate adaptations • Plan investigations and draw conclusions 		
Numeracy	<p>1.4+2.4 Waves</p> <ul style="list-style-type: none"> • extract data and compare quantities • interpret graphical representations • interpret graphical representations • use and interpret diagrammatical representations • measuring and recording angles • spotting trends in data • interpret diagrams that represent three dimensional arrangements • interpret diagrams • using various shapes interpret data in tables • use prefixes for units when handling large numbers relate quantities to graphical representations • Apply units correctly • Consider measurements of a small scale and appropriate units • Record measurements <p>2.5 Matter</p> <ul style="list-style-type: none"> • Extract data • interpret tabular and graphical data • Interpret graphs • Plot graphs and identify outliers • Understand and 	<p>2.3 Energy</p> <ul style="list-style-type: none"> • Collect data and use appropriate units • Present and interpret data • Sketch graphs based on predictions <p>2.8 Organisms</p> <ul style="list-style-type: none"> • Extract and use data from graphs • make suggestions based on numerical data • Explain the meaning of chemical formulae • Identify appropriate equipment and values of reactants 	<p>2.6 Reactions</p> <ul style="list-style-type: none"> • Balancing chemical equations • sketching graphs to compare energy changes • construct graphs • construct graphs to display primary data • calculate an average (mean) • Balance symbol equations • perform calculations using formulae 	<p>2.1 Forces</p> <ul style="list-style-type: none"> • Use units correctly • Gather data • Construct and interpret line graphs • Use formulae to perform calculations and understand units • Understand surface area • Make careful measurements, using appropriate units <p>2.9 Ecosystems</p> <ul style="list-style-type: none"> • Understand efficiency in terms of energy generation • understand scale and magnification • Understand ratios 	<p>2.2 Electromagnets</p> <ul style="list-style-type: none"> • use symbols to represent physical objects • identify trends and patterns • use formulae to perform calculations • identify patterns in data • identify trends in data • Display data in tables and graphs • Collect and present data <p>2.7 Earth</p> <ul style="list-style-type: none"> • Understanding of scale • Interpret graphs • Interpret information from tables • understand diagrams representing three dimensional phenomena • using large numbers interpret diagrams of three dimensional phenomena 	<p>2.10 Genes</p> <ul style="list-style-type: none"> • Construct and interpret graphs • Identify a double helix structure • Awareness of timelines • Calculate numbers of chromosomes • Calculate and explain ratios and percentages

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	<p>express ratios</p> <ul style="list-style-type: none"> • Balance symbol equations • Extract and use data from tables 					
<p>CIAG</p> <p>Links made to various careers in lessons via PowerPoints</p>			<p><u>HT3:</u></p> <p>Year 8: The Institute of Physics Schools Lecture - Defying Gravity</p>	<p><u>HT4:</u></p> <p>All year groups to take part in NCW STEM lessons – where can science take you?</p>		