

**INTENT-**

- To develop knowledge and understanding of key Biology, Chemistry and Physics topics
- Students to apply this knowledge and explain key ideas within Science, applying them to a range of typical and frequent assessment points.
- To develop basic practical skills and data analysis.

**The bigger picture:**

The year 7 curriculum starts to develop an understanding of key scientific concepts needed throughout the curriculum and creating a building block for later years. The curriculum is also designed to start developing an enquiring mind through key practical's that will allow for skills needed for Required practical's at GCSE to be built on.

**Bilton School Planning for Progress over Time Programme of Study**

**IMPLEMENTATION**

	Term 1 Introduction to Science, Acids & Alkalis, Cells								Term 2 Cells, Energy, Particles							Term 3 Particles, Reproduction						Term 4 Solubility Investigation, Electricity					Term 5 Electricity, Atoms & Elements						Term 6 Ecosystems, Ecosystems Project						
KS3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Year 7	TTD x 2, Intro to Science L1	Intro to Science L2, 3, 4	Intro to Science L5, 6, 7 (Review)	Acids & Alkalis L1, 2	Acids & Alkalis L3, 4, 4.5 (Mid Review)	Acids & Alkalis L5, 6 (Research Lesson), 7RP	Acids & Alkalis L8RP, 9 (Revision), ETT Cells 1	Cells L2, 3, 4	Cells L4.5 (Mid Review), 5 (Research Lesson), 6	Cells L7RP, 8RP, 9 (Revision)	Energy L1, 2	Energy L3, 4, 4.5 (Mid Review)	Energy L5, 6, 7RP	Energy L8RP, 9 (Revision), ETT Particles L1	Particles L2, 3, 4	Particles L4.5 (Mid Review), 5, 6	Particles L7RP, 8RP, 9 (Revision)	Reproduction L1, 2, 3	Reproduction L4, 4.5 (Mid Review), 5	Reproduction L6, 7RP, 8RP	Reproduction L9 (Revision), ETT, Solubility Invest. L1	Solubility Investigation L2, 3, 4	Solubility Investigation L5, 6 (Review), Electricity L1	Science Week Lessons, Electricity L2	Electricity L3, 4, 4.5 (Mid Review)	Electricity Lesson L5, 6, 7RP	Electricity L8RP, 9 (Revision), ETT	Atoms & Elements L1, 2 (Research Lesson), 3	Atoms & Elements L4, 4.5 (Mid Review), 5	Atoms & Elements L6, EOY Assessment Revision x 2	EOY Assessment Revision x 3	EOY Assessment Revision x 2 EOY Assessment	Atoms & Elements L7RP, 8RP, 9 (Revision)	Ecosystems L1, 2, 3	Ecosystems L4, EOY Assessment Review/FAR	Ecosystems L4.5 (Mid Review), 5, 6	Ecosystems L7RP, 8RP, 9 (Revision)	Ecosystems Project L1, 2, 3	Ecosystems Project L4, 5, 6
Progress and assessment	End of topic test (ETT)  Follow on questions to test previous knowledge through the Unit.  FAR completed approximately every 6 lessons.								End of topic test (ETT)  Follow on questions to test previous knowledge through the Unit.  FAR completed approximately every 6 lessons.							End of topic test (ETT)  Follow on questions to test previous knowledge through the Unit.  FAR completed approximately every 6 lessons.						End of topic test (ETT)  Follow on questions to test previous knowledge through the Unit.  FAR completed approximately every 6 lessons.					Follow on questions to test previous knowledge through the Unit.  FAR completed approximately every 6 lessons.						End of topic test (ETT)  Follow on questions to test previous knowledge through the Unit.  FAR completed approximately every 6 lessons.						
Required Practical (RP)	<b>Introduction to Science:</b> Skills throughout Topic Diagrams/Units/Graphs  <b>Acids and Alkalis:</b> Testing Substances with UI Making and recording observations.								<b>Cells:</b> Studying Cells Using a Microscope Writing a method  <b>Energy:</b> Testing Energy in Food Graph							<b>Particles:</b> Making Crystals Writing a risk assessment.  <b>Reproduction:</b> Skills Converting Units						<b>Solubility Investigation</b>  <b>Electricity: Voltage/Current Investigation</b> Graph					<b>Atoms and Elements:</b> Skills Variables  Group 1 metals Demo						<b>Ecosystems:</b> Quadrat Sampling Planning an Investigation						
Numeracy Skills	Reading from equipment and interpreting scales								Comparing size of cells and organisms with reference to a microscope							Converting between different units of time, distance and mass.  Use of standard form and a calculator						Use of calculator and mental arithmetic in calculating current, charge, potential difference and power of devices  Conversion between appropriate units					Using data from tables to plot appropriate graphs Interpreting information from graphs and tables						Calculating area using random sampling.  Using decimals and fractions in calculations						
Homework	Educake Homework								Educake Homework							Educake Homework						Educake Homework					Educake Homework												
Key Vocabulary/literacy opportunities	<b>Introduction to Science:</b> Laboratory, Safety, Goggles, Equipment, Method, Table, Graph, Results, Conclusion. <b>Acids and Alkalis:</b> Acid, Alkali, Neutral, Neutralisation, Indicator, pH Scale <b>Cells:</b> Cell, Nucleus, Cell Membrane, Cytoplasm, Cell Wall, Chloroplast, Specialised Cell, Diffusion, Osmosis, Organ, Organ System.								<b>Cells:</b> Cell, Nucleus, Cell Membrane, Cytoplasm, Cell Wall, Chloroplast, Specialised Cell, Diffusion, Osmosis, Organ, Organ System. <b>Energy:</b> Energy, Kinetic, Thermal, Light, Sound, Electrical, Chemical, Nuclear, Gravitational Potential, Elastic Potential, Transfer, Power, Work Done, Efficiency, Fuel							<b>Particles:</b> Particle, Solid, Liquid, Gas, Vibrate, Melting, Boiling, Diffusion, Pressure <b>Reproduction:</b> Reproduction, Sperm, Egg, Fertilisation, Foetus, Pollination, Seed Dispersal, Germination.  <b>Guided Reading Activity:</b> Reproduction – To be confirmed						<b>Solubility:</b> Soluble, Solute, Solvent, solution, insoluble, filtration  <b>Electricity:</b> Electricity, Ammeter, Voltmeter, Current, Potential Difference, Resistance, Series Circuit, Parallel Circuit					<b>Atom and Elements:</b> Atom, Element, Periodic Table, Properties, Metal, Non-metal, Groups, Periods <b>Ecosystems:</b> Respiration, Classification, Food Web, Food Chain, Producers, Consumers, Pesticides, Ecosystem, Habitat, Population.  <b>Guided Reading Activity:</b> Exploration of the dangers of electricity and features of electrical devices that help to protect us from these dangers.						<b>Ecosystems:</b> Respiration, Classification, Food Web, Food Chain, Producers, Consumers, Pesticides, Ecosystem, Habitat, Population.  <b>Guided Reading Activity:</b> Exploration of the different types of zoo and an evaluation of the advantages and disadvantages of their use in conservation.						

<p><b>National curriculum links</b></p>	<p><b>Acids and alkalis:</b></p> <ul style="list-style-type: none"> <li>defining acids and alkalis in terms of neutralisation reactions</li> <li>the pH scale for measuring acidity/alkalinity; and indicators</li> <li>reactions of acids with metals to produce a salt plus hydrogen</li> <li>reactions of acids with alkalis to produce a salt plus water</li> </ul> <p><b>Cells:</b></p> <ul style="list-style-type: none"> <li>cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope</li> <li>the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts</li> <li>the similarities and differences between plant and animal cells</li> </ul>	<p><b>Cells:</b></p> <ul style="list-style-type: none"> <li>cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope</li> <li>the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts</li> <li>the similarities and differences between plant and animal cells</li> </ul> <p><b>Energy:</b></p> <ul style="list-style-type: none"> <li>comparing energy values of different foods (from labels) (kJ)</li> <li>comparing power ratings of appliances in watts (W, kW)</li> <li>comparing amounts of energy transferred (J, kJ, kW hour)</li> <li>simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged</li> <li>other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.</li> </ul>	<p><b>Particles:</b></p> <ul style="list-style-type: none"> <li>the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure</li> <li>changes of state in terms of the particle model.</li> <li>conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving diffusion in liquids and gases driven by differences in concentration</li> </ul> <p><b>Reproduction:</b></p> <ul style="list-style-type: none"> <li>reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta</li> <li>reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</li> </ul>	<p><b>Electricity:</b></p> <ul style="list-style-type: none"> <li>electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge</li> <li>potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current</li> <li>differences in resistance between conducting and insulating components (quantitative).</li> </ul>	<p><b>Atoms and Elements:</b></p> <ul style="list-style-type: none"> <li>a simple (Dalton) atomic model</li> <li>differences between atoms, elements and compounds</li> <li>chemical symbols and formulae for elements and compounds</li> <li>the varying physical and chemical properties of different elements</li> <li>the principles underpinning the Mendeleev Periodic Table</li> <li>the Periodic Table: periods and groups; metals and non-metals</li> <li>how patterns in reactions can be predicted with reference to the Periodic Table</li> </ul> <p><b>Ecosystems:</b></p> <ul style="list-style-type: none"> <li>the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops</li> <li>the importance of plant reproduction through insect pollination in human food security</li> <li>how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.</li> </ul>	<p><b>Ecosystems:</b></p> <ul style="list-style-type: none"> <li>the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops</li> <li>the importance of plant reproduction through insect pollination in human food security</li> <li>how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.</li> </ul>
<p><b>Connected knowledge</b></p>	<p><b>Maths</b> To know units of measurement To know metric measures Converting between metric units</p> <p><b>KS3 Links</b> Links to photosynthesis Links to reproductive cells</p> <p><b>KS4 Links</b> Links to Chemical changes Links to Cell Biology</p>	<p><b>KS3 Links</b> Links to Types of reaction – Year 9</p> <p><b>KS4 Links</b> Links to Energy Links to Particles - Physics</p>	<p><b>Maths</b> To know units of measurement To know metric measures Converting between metric units</p> <p><b>KS3 Links</b> Links to Variation – Year 9</p> <p><b>KS4 Links</b> Links to Inheritance, variation and evolution Links to reproduction</p>	<p><b>Maths</b> To multiply and divide integers To be able to use mental methods of addition and subtraction To be able to use written methods of addition and subtraction of integers (including negatives) To calculate using order of operations (BIDMAS) To multiply and divide by powers of 10 To do mental multiplication and division To use written methods of multiplication and division.</p> <p><b>KS4 Links</b> Links to Energy and Electricity topics</p>	<p><b>Geography</b> Destruction of Habitats Food security</p> <p><b>KS4 Links</b> Links to Structure and bonding Links to Atomic structure and the periodic table Links to ecosystems in KS4</p>	<p><b>Geography</b> Destruction of Habitats Food security</p> <p><b>KS4 Links</b> Links to ecosystems in KS4</p>
<p><b>Spiritual, Moral, Social and cultural.</b></p>	<p>Linking their understanding to the chemicals around them in everyday life.</p>		<p>Understand the process of reproduction to be able to consider different viewpoints outside of science.</p>		<p>Understand the importance of different scientists in the development of the periodic table.</p>	<p>Linking their understanding to different species and the environment.</p> <p>Building students self-knowledge, self-esteem and self-confidence when looking at new situations of how conservation can have a positive impact on the environment.</p>

<p><b>British Values</b></p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Reproduction – Understanding the scientific process of reproduction to be able to understand moral and ethical viewpoints linked to this.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Respect for others, the natural world and our environment.</p> <p>Following the laboratory rules when conducting practical work.</p>
<p><b>Cultural Capital</b></p>	<p>Science - Careers display on W side corridor.</p> <p>Understand where chemicals are used in everyday life along with the hazards.</p> <p>Careers posters in all Science rooms</p>	<p>Science - Careers display on W side corridor.</p> <p>Careers posters in all Science rooms</p>	<p>Science - Careers display on W side corridor.</p> <p>Careers posters in all Science rooms</p>	<p>Science - Careers display on W side corridor.</p> <p>Science Week.</p> <p>Careers posters in all Science rooms</p>	<p>Science - Careers display on W side corridor.</p> <p>Careers posters in all Science rooms</p>	<p>Science - Careers display on W side corridor.</p> <p>Students will have an appreciation for the environment around them and the wider world through the topic content and visiting a local zoo.</p> <p>Careers posters in all Science rooms</p>