

## Subject Intent: Science

		Term 1		Term 2		Term 3	
Weeks	7	7	6	6	6	7	
Core Knowledge/ Skills and Concepts	<b><u>Cells – the Building Blocks of Life</u></b>	<b><u>Mixing, Dissolving and Separating</u></b>	<b><u>Forces and their effects</u></b>	<b><u>Eating, Drinking, Breathing</u></b>	<b><u>Elements, compounds and reactions</u></b>	<b><u>Energy Transfers and sound</u></b>	
	<ul style="list-style-type: none"> <li>Cells as the fundamental unit of living organisms, including how to observe 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 animal and plant cells</li> <li>The structural adaptations of some unicellular organisms</li> <li>The role of diffusion in the movement of materials in and between cells</li> <li>Diffusion in liquids and gases driven by differences in concentration</li> <li>Hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms</li> <li>Reproduction in plants, including flower structure, wind and insect pollination, fertilisation</li> <li>The importance of plant reproduction through insect pollination in human food security.</li> <li>Seed and fruit formation and dispersal</li> <li>Quantitative investigation of some dispersal mechanisms</li> <li>Reproduction in humans (as an example of a mammal), including the structure and function of</li> </ul>	<ul style="list-style-type: none"> <li>Differences between atoms, elements and compounds</li> <li>Chemical symbols and formulae for elements and compounds</li> <li>The concept of a pure substance</li> <li>Mixtures, including dissolving</li> <li>Simple techniques for separating mixtures:</li> <li>Filtration, evaporation, distillation, chromatography</li> <li>The composition of the atmosphere</li> <li>The identification of pure substances</li> <li>Conservation of mass, changes of state and chemical reactions</li> </ul>	<ul style="list-style-type: none"> <li>Forces as pushes or pulls arising from the interaction between two objects</li> <li>Using force arrows in diagrams</li> <li>Forces measured in newtons</li> <li>Gravity forces acting at a distance on Earth and in space</li> <li>Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion</li> <li>Forces associated with deforming objects</li> <li>Measurements of stretch or compression as force is changed</li> <li>objects; stretching and squashing – springs</li> <li>Measurements of stretch or compression as force is changed</li> <li>Force–extension linear relation; Hooke’s Law as a special case</li> <li>Rubbing and friction forces between surfaces</li> <li>Forces: pushing things out of the way; resistance to motion of air and water</li> <li>Balanced and unbalanced forces</li> <li>Change depending on direction of force and its size</li> <li>Speed and the quantitative relationship between average speed, distance and time</li> <li>(speed = distance ÷ time)</li> </ul>	<ul style="list-style-type: none"> <li>Calculations of energy requirements in a healthy daily diet</li> <li>Comparing energy values of different foods (from labels) (kJ)</li> <li>The consequences of imbalances in the diet including obesity, starvation and deficiency diseases</li> <li>The tissues and organs of the digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)</li> <li>The importance of bacteria in the human digestive system</li> <li>The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases</li> <li>Simple measurements of lung volume</li> <li>The structure and functions of the gas exchange system in humans, including adaptations to function</li> <li>Diffusion in liquids and gases driven by differences in concentration and in terms of the particle model</li> <li>The impact of exercise, asthma and smoking</li> </ul>	<ul style="list-style-type: none"> <li>Chemical symbols and formulas for elements and compounds</li> <li>The principles underpinning the Mendeleev Periodic Table</li> <li>The Periodic Table: periods and groups; metals and non-metals</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 properties of metals and non-metals</li> <li>Chemical symbols and formulae for elements and compounds</li> <li>Chemical reactions as the rearrangement of atoms</li> <li>Representing chemical reactions using formulae and using equations</li> <li>The chemical properties of metal and non-metal oxides with respect to acidity</li> <li>The varying physical and chemical properties of different elements</li> <li>Representing chemical reactions using formulae and using equations</li> <li>Conservation of mass changes of state and chemical reactions</li> <li>Combustion, thermal decomposition, oxidation</li> </ul>	<ul style="list-style-type: none"> <li>Processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, burning fuels, changing motion, dropping an object, stretching a spring.</li> <li>Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change</li> <li>Work done and energy changes on deformation</li> <li>Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy in elastic distortions</li> <li>Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one</li> <li>Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with temperatures</li> <li>Fuels and energy resources; other processes that involve energy transfer: burning fuels, metabolism of food</li> <li>Comparing the starting with the final conditions of a system and describing increases and</li> </ul>	
Year 7							

	<p>the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth</p> <ul style="list-style-type: none"> <li>The effect of maternal lifestyle on the foetus through the placenta</li> </ul>		<ul style="list-style-type: none"> <li>Moment as the turning effect of a force</li> </ul>	<p>on the human gas exchange system</p>		<p>decreases in the amounts of energy in chemical compositions</p> <ul style="list-style-type: none"> <li>Sound produced by vibrations of objects; sound waves are longitudinal</li> <li>Sound produced by vibrations of objects, in loudspeakers; detected by their effect on microphone diaphragm and the ear drum</li> <li>Frequencies of sound waves, measured in hertz (Hz)</li> <li>Echoes; the speed of sound in air</li> <li>Sound needs a medium to travel; the speed of sound in air, in water, in solids</li> <li>Echoes, reflection and absorption of sound</li> <li>Sound produced by vibrations of objects, detected by their effects on microphone diaphragm and the ear drum</li> <li>Waves transferring information for conversion to electrical signals by microphone</li> <li>Auditory range of humans and animals</li> <li>Pressure waves transferring energy; use for cleaning and physiotherapy by ultrasound</li> </ul>
<i>How will it be assessed?</i>	<p>Year 7 baseline test 3 end of topic tests (Collins) Yellow sticker feedback weekly Revision exercise fortnightly</p>	<p>2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly</p>	<p>2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly</p>	<p>2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly</p>	<p>2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly</p>	<p>2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly EOY GL Assessment</p>
<i>Why are we doing this now? How does this build on prior knowledge and the knowledge still to come?</i>	<p>An introduction for year 7 to a science topic that should be accessible to all students. Cells reappears at GCSE as</p>	<p>An introduction to equipment for year 7 students. The beginning of a key concept of atoms, extended in Summer to elements.</p>	<p>Extension of forces learnt in primary school. Introduction of force arrows, data collection and graph drawing</p>	<p>Introduction of diffusion, a key concept in biology. Building on digestion learnt in primary school. Introduction of term enzyme as a chemical that breaks another chemical down.</p>	<p>Forming idea of metals and non metals. First look at a Periodic Table and its history. The beginning of identifying patterns in elements and recognising specific chemical reactions</p>	<p>Key concept: energy can be stored, transferred, dissipated but not lost. Labelling energy in terms of what we see it do eg light. Introduction of waves and how they produce sound.</p>

<i>Weekly Focus</i>	<p>1.Comparing plant and animal cells</p> <p>Describing cells</p> <p>2.understanding unicellular organisms</p> <p>Understanding diffusion</p> <p>3.organisation in multicellular organisms</p> <p>Comparing flowering plants</p> <p>4.knowing how pollination leads to fertilisation</p> <p>5.the challenges facing pollinators</p> <p>Disperal of seeds by the wind</p> <p>6. Disperal of fruit seeds</p> <p>The male reproductive system</p> <p>7. The female reproductive system and fertility</p> <p>Puberty</p> <p>How the foetus develops</p>	<p>1.Working safely in a laboratory</p> <p>Recording experiments</p> <p>Recognising materials, substances and elements</p> <p>2.understanding water</p> <p>Dissolving</p> <p>Separating mixtures</p> <p>3.Dissolving and evaporating</p> <p>Extracting salt</p> <p>Understanding distillation</p> <p>4.what is air made of?</p> <p>Exploring chromatography</p> <p>5.Using chromatography</p> <p>6.Finding the best solvent</p> <p>7.modelling mixtures and separation</p>	<p>1Discovering and measuring forces.</p> <p>Understanding weight on other planets.</p> <p>Exploring the effects of forces</p> <p>2.understanding stretch and compression</p> <p>Hooke’s Law</p> <p>3.friction</p> <p>The benefits of friction</p> <p>4.air and water resistance</p> <p>Streamlining</p> <p>Fores and motion</p> <p>5.how forces affect speed and direction</p> <p>speed calculations</p> <p>6.turning forces</p> <p>moments</p>	<p>1.Exploring a healthy diet</p> <p>Testing foods</p> <p>Comparing energy needs</p> <p>2.Exploring Obesity and starvation</p> <p>Deficiency diseases</p> <p>Understanding the Human Digestive System</p> <p>Understanding the start of digestion</p> <p>3.the role of digestive organs</p> <p>Introducing enzymes</p> <p>The role of bacteria</p> <p>4. How we breathe</p> <p>Measuring breathing</p> <p>5.Evaluating gas exchange in Humans</p> <p>Investigating Diffusion</p> <p>6.Exploring the effects of disease and lifestyle</p>	<p>1. Identifying metalloids</p> <p>Discovering the origin of metals</p> <p>2. Choosing elements for a purpose</p> <p>3. Combining elements</p> <p>Using models to understand chemistry</p> <p>4. Understanding what happens when an element burns</p> <p>Observing how elements react in different ways</p> <p>5. Identifying the special features of carbon</p> <p>Understanding oxidation</p> <p>6. Investigating carbonates</p> <p>Explaining changes</p>	<p>1. Exploring energy transfers</p> <p>Understanding potential energy and kinetic energy</p> <p>Doing work</p> <p>2. Looking at dynamos</p> <p>Understanding elastic potential energy</p> <p>3. Knowing the difference between heat and temperature</p> <p>Thinking about fuels</p> <p>4. Investigating fuels</p> <p>5. Exploring sound</p> <p>Describing sound</p> <p>Measuring the speed of sound</p> <p>6. Understanding how sounds travels through materials</p> <p>Learning about the reflection and absorption of sound</p> <p>Hearing sounds</p> <p>7. Understanding factors affecting hearing</p> <p>Finding out about sounds we cannot hear</p>
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<i>Core Knowledge/ Skills and Concepts</i>	<p><b><u>Getting the energy Your Body Needs</u></b></p> <ul style="list-style-type: none"> <li>The structure and functions of the human skeleton, to include support, protection, movement and making blood cells</li> <li>The function and antagonistic actions of major muscle groups</li> <li>Biomechanics – the interaction between skeleton and muscles, including the measurement of force by different muscles</li> <li>Aerobic and anaerobic respiration in living</li> </ul>	<p><b><u>Explaining Physical Changes</u></b></p> <ul style="list-style-type: none"> <li>The properties of different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure</li> <li>Brownian motion in gases</li> <li>Changes of state in terms of the particle model</li> <li>Energy changes on changes of state (qualitative)</li> <li>Changes with temperature in motion and spacing of particles</li> <li>A simple Dalton atomic model</li> </ul>	<p><b><u>Exploring Contact and Non-Contact Forces</u></b></p> <ul style="list-style-type: none"> <li>Non-contact forces: forces between magnets</li> <li>Magnetic poles, attraction and repulsion</li> <li>Magnetic fields by plotting with compass, representation by field lines</li> <li>Earth’s magnetism</li> <li>Non-contact forces: forces due to static electricity</li> <li>Separation of positive or negative charges when objects are rubbed together: transfer of</li> </ul>	<p><b><u>Looking at Plants and Ecosystems</u></b></p> <ul style="list-style-type: none"> <li>The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere</li> <li>The reactants in, and products of, photosynthesis, and a word summary for photosynthesis</li> </ul>	<p><b><u>Explaining Chemical Changes</u></b></p> <ul style="list-style-type: none"> <li>Defining acids and alkalis in terms of neutralisation reactions</li> <li>The chemical properties of metal and non-metal oxides with respect to acidity</li> <li>Chemical symbols and formulae for elements and compounds</li> <li>The pH scale for measuring acidity/alkalinity; and indicators</li> <li>Defining acids and alkalis in terms of neutralisation reactions</li> <li>The pH scale for measuring</li> </ul>	<p><b><u>Magnetism and Electricity</u></b></p> <ul style="list-style-type: none"> <li>Earth’s magnetism, compass and navigation</li> <li>Magnetic poles, attraction and repulsion</li> <li>Earth’s magnetism, compass and navigation</li> <li>The magnetic effect of a current, electromagnets and D.C. motors (principles only)</li> <li>Transfer of electrons, forces between charged objects</li> <li>Other processes that involve energy transfer: completing an electrical circuit; electric current,</li> </ul>
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	<p>organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life</p> <ul style="list-style-type: none"> <li>• The word summary for aerobic respiration</li> <li>• The process of anaerobic respiration in humans and micro-organisms, including fermentation.</li> <li>• The word summary for anaerobic respiration</li> <li>• The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism</li> </ul>	<ul style="list-style-type: none"> <li>• The similarities and differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition</li> <li>• The properties of different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure</li> <li>• Diffusion in liquids and gases driven by differences in concentration</li> <li>• Diffusion in terms of the particle model</li> <li>• Conservation of material and mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving</li> <li>• Mixtures, including dissolving</li> <li>• The difference between chemical and physical changes</li> <li>• The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition</li> </ul>	<p>electrons, forces between charged objects</p> <ul style="list-style-type: none"> <li>• The idea of electric field, forces acting across the space between objects not in contact</li> <li>• Non-contact forces: gravity forces acting at a distance on Earth and in space</li> <li>• Pressure measured by ratio of force over area – acting normal to any surface</li> <li>• Pressure in liquids, increasing with depth; upthrust effects, floating and sinking</li> <li>• Atmospheric pressure, decreases with increase of height as weight of air above decreases with height</li> </ul>	<ul style="list-style-type: none"> <li>• Plants making carbohydrates in their leaves by photosynthesis</li> <li>• The adaptations of leaves for photosynthesis</li> <li>• The role of leaf stomata in gas exchange in</li> <li>• Reactants in, and products of, photosynthesis, and the word equation for photosynthesis</li> <li>• Plants gaining mineral nutrients and water from the soil via their roots</li> <li>• The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops as an example</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>acidity/alkalinity; and indicators</p> <ul style="list-style-type: none"> <li>• Reactions of acids with alkalis to produce salt and water</li> <li>• Representing chemical reactions using formulae and using equations</li> <li>• Chemical reactions as the rearrangement of atoms</li> <li>• Reaction of acids with metals to produce salts and hydrogen</li> <li>• Combustion</li> <li>• Conservation of mass chemical reactions</li> </ul>	<p>measured in amperes, in circuits</p> <ul style="list-style-type: none"> <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> <li>• Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge</li> </ul>
<i>How will it be assessed?</i>	2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly	2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly	2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly	2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly	2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly	2 end of topic tests Yellow sticker feedback weekly Revision exercise fortnightly EOY GL ASSESSMENT
<i>Why are we doing this now? How does this build on prior knowledge and the knowledge still to come?</i>	This is building on prior knowledge of cells, developing the concept of organ systems. The second half of the topic deals with respiration. It is key that all students know the word summary for respiration	Students should know materials are made of atoms. This topic develops the idea that depending on the arrangement and movement of the atoms, you have a solid, liquid or gas. Each material can move between states and that movement has a term eg melting.	Students should know what forces do and how to draw force diagrams. This topic has a closer look at non- contact forces : gravity, magnetism and electrostatic. The topic leads into pressure as a measurement of force/area.	Building on the knowledge of plant structure (primary) and reproduction, this topic helps students understand the function and adaptations of leaves. It delves into photosynthesis, a key topic in GCSE. Accumulation of toxins is repeated at GCSE, so it is useful	A detailed topic introducing combustion and neutralisation. Some interesting lab skills including checking if a reaction has happened (indicators).	Developing knowledge of magnetism gained in primary school (repulsion, attraction, poles) and observing the effect in DC motors. This will be developed further at GCSE when students should be able to explain the effect. Simple electrical circuits with the introduction of resistance. A

		It develops how gases and liquids move by diffusion (first met in biology). This is the first time students label an atom.		to introduce it here in preparation for KS4		difficult but key concept which is added onto at KS4.
<i>Weekly Focus</i>	<p>1. Exploring the human skeleton Analysing the skeleton Understanding the role of skeletal joints</p> <p>2. Investigating muscle strength Analysing muscle strength Examining interacting muscles</p> <p>3. Exploring problems with the skeletal system Understanding how our muscles get energy</p> <p>4. Investigating respiration Analysing adaptations for respiration</p> <p>5. Interrogating links between respiration and body systems Exploring respiration in sport</p> <p>6. Understanding anaerobic respiration Investigating fermentation</p> <p>7. Comparing aerobic and anaerobic respiration</p>	<p>1. Using particles to explain matter Understanding solids Exploring Brownian motion</p> <p>2. Understanding liquids and gases Changing state Understanding evaporation</p> <p>3. Exploring thermal expansion Making sense of models</p> <p>4. Explaining density of solids and liquids Explaining the density of gases</p> <p>5. Explaining concentration and pressure Exploring diffusion</p> <p>6. Conserving mass Deciding between physical and chemical changes</p> <p>7. Explaining the properties of mixtures Using particle models</p>	<p>1. Exploring magnets Understanding magnetic fields Investigating static charge</p> <p>2. Explaining static charge Understanding electric fields Applying what we know about electrostatics</p> <p>3. Exploring gravity on Earth Applying our understanding of gravity to space travel</p> <p>4. Exploring pressure on a solid surface Calculating pressure</p> <p>5. Exploring pressure in a liquid Explaining floating and sinking</p> <p>6. Exploring pressure of a gas Working with pressure</p>	<p>1. Understanding the importance of plants Exploring how plants make food Looking at leaves</p> <p>2. Exploring the role of stomata Investigating photosynthesis</p> <p>3. Exploring the movement of water and minerals in plants Investigating the importance of minerals to plants Making food differently</p> <p>4. Transferring energy Exploring the importance of insects Looking at other examples of interdependence</p> <p>5. Interacting with the environment Keeping a balance</p> <p>6. Understanding the effects of toxins in the environment Living together</p>	<p>1. Exploring acids Exploring alkalis Using indicators</p> <p>2. Using universal indicator Exploring neutralisation Explaining neutralisation</p> <p>3. Understanding salts Exploring the reactions of acids with metals Exploring the reactions of acids with carbonates</p> <p>4. Investigating the effectiveness of antacids Understanding the importance of acids and alkalis</p> <p>5. Exploring combustion Understanding combustion and the use of fuels</p> <p>6. Exploring the effects of burning Understanding acid rain</p>	<p>1. Finding out the history of magnets Exploring magnetic materials</p> <p>2. Testing the strength of magnets Describing the Earth's magnetic field</p> <p>3. Investigating electromagnetism Using electromagnetism</p> <p>4. Exploring D.C. motors Investigating batteries</p> <p>5. Describing electric circuits Energy in circuits</p> <p>6. Explaining resistance Investigating factors affecting resistance</p> <p>7. Explaining circuits using models</p>
<i>Weeks</i>	7	7	6	6	6	7
<i>Core Knowledge/ Skills and Concepts</i>	<p><b>Variation and Inheritance</b></p> <ul style="list-style-type: none"> <li>Differences between species</li> <li>The variation between species</li> <li>The importance of maintaining biodiversity</li> <li>The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation</li> <li>The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection</li> <li>Heredity as the process by which genetic information is transmitted from one generation to the next</li> </ul>	<p><b>Obtaining Useful Materials</b></p> <ul style="list-style-type: none"> <li>Earth as a source of limited resources</li> <li>The order of metals and carbon in the reactivity series</li> <li>Representing chemical reactions using formulae and using equations</li> <li>Thermal decomposition</li> <li>Displacement reactions</li> <li>Conservation of mass and chemical reactions</li> <li>The use of carbon in obtaining metals from metal oxides</li> <li>Representing chemical reactions using formulae and using equations</li> <li>The production of carbon dioxide by human activity and the impact on climate</li> </ul>	<p><b>Motion on Earth and in Space</b></p> <ul style="list-style-type: none"> <li>The representation of a journey on a distance–time graph</li> <li>Relative motion: trains and cars passing one another</li> <li>Opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface</li> <li>Adding forces in one dimension</li> <li>Gravity force, weight = mass × gravitational field strength (g), on earth g = 10 N/kg, different on other planets and stars</li> <li>Gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)</li> </ul>	<p><b>Our Health and the Effects of Drugs</b></p> <ul style="list-style-type: none"> <li>The effects of ‘recreational’ drugs (including substance misuse) on behaviour, health and life processes</li> <li>The impact of exercise, asthma and smoking on the human gas exchange system</li> <li>These topics are aimed at embedding and developing ideas from topics earlier in the scheme, including cell structure and function, and body systems, in the context of health</li> </ul>	<p><b>Using our Earth Sustainably</b></p> <ul style="list-style-type: none"> <li>The composition of the Earth</li> <li>The composition of the atmosphere</li> <li>The production of carbon dioxide by human activity and the impact on climate</li> <li>The carbon cycle</li> <li>Earth as a source of limited resources</li> <li>The efficacy of recycling</li> <li>The structure of the Earth</li> <li>The rock cycle and the formation of igneous, sedimentary and metamorphic rocks</li> </ul>	<p><b>Waves and Energy Transfer</b></p> <ul style="list-style-type: none"> <li>Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition</li> <li>The similarities and differences between light and waves in matter</li> <li>Light waves travelling through a vacuum; speed of light</li> <li>The transmission of light through materials: absorption, diffuse scattering and specular reflection</li> <li>Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and convex lens in</li> </ul>



<i>Why are we doing this now? How does this build on prior knowledge and the knowledge still to come?</i>	Leading on from cells contain a nucleus with genetic information, this explores how the genetic information is passed on to future generations. It is also start of understanding the function of genetic information and how its structure in gametes leads to variation. Extracting DNA is demonstration only.	The first opportunity for learning about the reactivity series. This is key in understanding how we extract metals. Both this and thermal decomposition are concepts revisited in GCSE.	A topic including plenty of practice drawing time / distance graphs and seeing how we can represent a journey graphically.  Space has 2 key concepts that are essential for KS4 : weight and gravity	Some of these topics are extensions of previous topics and are included in the GCSE course or part of the PHSCE curriculum. This term could be modified for a different use.	Moving on from elements and compounds, this topic helps students to see the earth and atmosphere as one. It develops the idea that elements move from living and non –living entities and the balance can be disrupted by human activity.	This chapter gives a solid introduction to two topics developed further at GCSE (Electromagnetic Spectrum)
<i>Weekly Focus</i>	1.Exploring differences 2.Looking closer at variation Exploring the causes of variation 3.Learning about selective breeding Finding out how organisms survive 4.Exploring why siblings are different Looking inside the nucleus 5.Extracting DNA Exploring human chromosomes 6.Passing on genes Looking at cloning 7.Learning about extinction	. 1.Obtaining metal ores Decomposing metal carbonates 2.Displacement reactions Using carbon to extract iron 3.Using carbon to extract other metals Explaining issues with metal extraction 4.Understanding exothermic reactions Comparing endothermic and exothermic reactions 5.Explaining ceramics and their properties Matching properties of ceramics to their uses 6.Explaining natural polymers Using man-made polymers Explaining natural composites 7.Using metal and ceramic-based composites Using plastic-based composites	1.Drawing a distance–time graph Explaining a distance–time graph 2.Describing relative motion Understanding equilibrium 3.Exploring equilibrium Understanding a gravitational field 4.Applying ideas about gravitational fields Looking at motion in the Solar System 5.Describing stars and galaxies Explaining the effects of the Earth's orbital motion 6.Measuring distances in the Universe	1.Exploring types of drugs. Understanding the impact of smoking 2.Considering the dangers of cannabis Understanding the effects of alcohol 3.Understanding the effects of other drugs Exploring addiction 4.Understanding how diseases are spread Exploring the body's defences 5.Exploring microbes Investigating the growth of bacteria 6.Understanding antibiotics Understanding vaccination	1.Understanding our atmosphere Exploring the effects of human activity 2.Understanding the global warming debate Understanding how carbon is recycled 3.Exploring damage to the Earth's resources Considering the importance of recycling 4.Understanding the structure of the Earth Exploring igneous rocks 5.Studying sedimentary rocks Using metamorphic rocks 6.Understanding the rock cycle	1.Making waves Exploring light waves 2.Explaining properties of light waves Exploring the ray model 3.Understanding energy transfer by light Exploring coloured light 4.Understanding fuels and energy Explaining conduction and radiation 5.Quantifying energy transfers
<i>Weeks</i>	7	7	6	6	6	7
<i>Core Knowledge/ Skills and Concepts</i>	<b><u>The study of Living Systems - Unit 4</u></b>  This unit will enable pupils to develop their biology practical skills and their underpinning knowledge and understanding of biology, including applications in the workplace and effects on the environment and society. The knowledge and skills developed are essential for technicians and assistant practitioners working in biology, healthcare, food science, agriculture, horticulture, beauty therapy and other biology-related industries and laboratory	<b><u>Skills and Techniques for Chemistry Investigations - Unit 3</u></b>  In this unit pupils will cover some of the fundamental topics in chemistry, including extraction of raw materials from the Earth and its atmosphere, classification, properties of materials, chemical reactions and the factors that affect chemical reactions. Pupils will develop skills in the safe handling of laboratory apparatus, observation and measurement. They will also develop the skills and	<b><u>Physics and our universe- Unit 5</u></b>  This unit develops pupil's knowledge and understanding of some fundamental principles of physical science and enables them to apply these principles to a range of practical situations. Electrical power is readily transferred and controlled, and is therefore used in many industrial, service and domestic devices. Technicians need to be familiar with basic electric circuits so that they can handle electrical equipment	<b><u>Using Equipment to Make Scientific Observations and Measurements– Unit 2</u></b>  This unit will enable learners to become familiar with a range of accessible observation and measurement scenarios and techniques. They will become familiar with the key characteristics of some of the most commonly used equipment, along with the correct use of some technical and scientific terminology. Pupils will have the opportunity to make both qualitative and quantitative observations	<b><u>Practical Scientific Project Unit 11</u></b>  This unit begins with pupil's choosing and planning an appropriate scientific project, including identifying risks and health and safety considerations. Pupils are given opportunities to explore and investigate areas of scientific theory. The scientific project is designed to allow pupils to show their scientific knowledge and practical skills. Pupils will be asked to plan, carry out and analyse the results of their investigation and present it	<b><u>Healthy Living Unit 9</u></b>  In this unit pupils will explore key issues such as healthy diet, fitness, personal hygiene, personal safety and the positive and negative effects they have on health. They will be encouraged to examine their own daily activities and demonstrate ways in which they can contribute to their own healthy lifestyle. Pupils will be given the opportunity to plan activities of their own choosing and reflect on the impact it has on the healthiness of their own way

	<p>services. Pupils will investigate how body systems respond to internal and external environmental changes, using hormonal and nervous signals to maintain the body processes. Pupils will gain an appreciation of how living organisms interact with each other and their surroundings. They will also gain an awareness of how organisms adapt to their environment.</p>	<p>techniques needed to follow laboratory procedures and processes safely, carry out risk analyses and use correct scientific symbols and terminology</p>	<p>safely. Pupils will have the opportunity to gain hands-on experience of using practical devices and test instruments. Pupils should appreciate that space programmes involve many scientific applications. Pupils will have the opportunity to explore some of the instrumentation used and appreciate the benefits that it brings. They will develop relevant practical skills required by employees who work in the science sector.</p>	<p>and measurements in a variety of practical situations. The unit gives pupils the opportunity to develop knowledge, skills and understanding which will provide a foundation for progression and employment in industries associated with scientific activity.</p>	<p>as a scientific report. They will record the activities they undertake during their project and monitor the progress of the project against the original plan they submit to the tutor. Pupils will carry out research and apply it to the project outcomes, presenting them as a scientific report. They will then review the project, analysing information and drawing their own conclusions, and reviewing their own performance. Throughout the project it is important that clear communication and interpersonal skills are developed that enable pupils to understand how the scientific community communicates with a wider audience.</p>	<p>of living. Completing this unit will contribute to learners' overall personal and social development and develop the skills and knowledge they need to make informed choices about healthy living. This understanding will help them to select activities that will improve the health of their lifestyle in the future and to educate and inform others</p>
<p><i>How will it be assessed?</i></p>	<p>Pupils work will be marked every three lessons with a yellow feedback form attached, this will give pupils information on <a href="#">WWW</a> and <a href="#">EBI</a>, pupils will also be expected to respond to teacher feedback, improving their work.</p> <p>Weekly Kahoot quiz – The quiz will be based on the content delivered to pupils that week.</p> <p>At the end of each unit of work an assessment sheet will be added, this informs pupils if the criteria have been achieved and if not how to improve their work.</p>					
<p><i>Why are we doing this now? How does this build on prior knowledge and the knowledge still to come?</i></p>	<p>It is important that pupils studying an applied science programme have a good knowledge of the basic concepts of biology that they can develop, and use, in a variety of applications.</p> <p>Building on the information gained when studying cells in KS3 knowledge of basic cell structure and homeostasis. They will also study human interaction with the environment and the role of genes in inheritance</p>	<p>Building on knowledge gained from KS3 on atoms, elements and compounds. The purpose of this unit is to develop pupil's knowledge of some of the concepts underlying chemistry, along with the applications of chemistry to manufacturing and service industries.</p>	<p>Physics has a wide range of applications both in everyday life and in the science laboratory. This unit develops pupil's knowledge and understanding of some fundamental principles of physical science and enables them to apply these principles to a range of practical situations.</p>	<p>The aim of this unit is to give pupils the knowledge, skills and understanding required to make observations and measurements in order to undertake scientific explorations safely and effectively using the relevant equipment.</p>	<p>The aim of this unit is to allow pupils to build on existing theories or practical work by conducting a practical science project related to their area of interest. The unit provides a natural investigative approach to extend their understanding and studies.</p>	<p>To improve pupil's wellbeing. Healthy living is crucial to physical, social and mental wellbeing. There is considerable concern from governments and worldwide organisations that many people in modern society are living lifestyles that are detrimental to their health.</p>
<p><i>Weekly Focus</i></p>	<ol style="list-style-type: none"> <li>1.Cellular basis of life</li> <li>2.The role of the <u>nervous</u> system in homeostasis</li> <li>3. The role of the <u>endocrine</u> system in homeostasis</li> <li>4. Components and adaptations of an ecosystem</li> <li>5. Effects of humans on ecosystems</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify and classify elements 1-10 in the periodic table</li> <li>2. Compare simple ionic and covalent materials</li> <li>3. Construct simple chemical equations</li> <li>4. Chemical changes</li> <li>5. Earth and it's atmosphere</li> </ol>	<ol style="list-style-type: none"> <li>1. Energy Stores and transfers and their importance</li> <li>2. Different types of Ionising Radiation</li> <li>3. Electromagnetic Spectrum</li> <li>4. Electric Circuits and taking measurements</li> <li>5. Structure of the Universe</li> <li>6. Investigating Space</li> </ol>	<ol style="list-style-type: none"> <li>1. Types of Measurements and their units</li> <li>2. Scientific observation</li> <li>3. List equipment needed for basic scientific observations and measurements and make predictions</li> <li>4. Using equipment safely and recording results</li> </ol>	<ol style="list-style-type: none"> <li>1. Health and safety risks</li> <li>2. Produce a project plan</li> <li>3. identify and use equipment safely in order to collect scientific data</li> <li>4. Record scientific data</li> <li>5. Analyse scientific data</li> <li>6. Produce a scientific report</li> </ol>	<ol style="list-style-type: none"> <li>1. Key elements of a healthy lifestyle</li> <li>2. Why a healthy lifestyle is important</li> <li>3. Select health activities which contribute to a healthy lifestyle</li> <li>4. Carry out selected activities</li> <li>5. Review health activities</li> </ol>

	6. The role of genes inheritance 7. Roles of genes in variation	6.Future fuels 7.Create useful Chemical products		5.Present conclusions from given situations 6. Compare conclusions from scientific observations.		6. Benefits of the chosen activities on the individual's health 7.Pupils suggest further activities which contribute to a healthy lifestyle.
<b>Weeks</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>7</b>
<i>Core Knowledge/ Skills and Concepts</i>	<p><b><u>Causes of Disease and Maintaining Health. Unit 7</u></b></p> <p>The unit explores questions about health and disease in a way that helps pupils relate topics to themselves. They will investigate a range of factors affecting health and learn to recognise symptoms of disease. Pupils will gain an awareness of common diseases and their causes. They will also examine a range of particular diseases which are prevalent in the developed and the developing worlds and are of particular topical interest. Understanding health and disease is important, not only in everyday life, but also in vocational settings. The awareness gained in this unit creates a platform for further study in all areas of science and paves the way towards careers in a wide variety of business and industrial settings. On completion of this unit, learners will be able to recognise symptom profiles of common diseases, including some that are life threatening. They will also be able to identify factors contributing to ill health such as family history, diet, substance abuse and lifestyle choices. Pupils will be able to make informed choices about their own lifestyles and gain a better understanding of public health campaigns presented in the media. Finally, they will develop a greater awareness of global health concerns such as communicable diseases in the developing world.</p>	<p><b><u>Forensic Detection – Unit 8</u></b></p> <p>In this unit pupils are provided with the opportunity to learn about different types of biological, chemical and physical forensic evidence, how evidence is detected, collected and documented at the crime scene, and how to use scientific techniques to detect and identify evidence in the laboratory. Pupils are also introduced to the role and responsibilities of the SOCO, the forensic scientist and the forensic science laboratory. The unit introduces and develops the skills, understanding and knowledge of analytical scientific detection processes and their application to forensic science. The skills developed are essential for forensic science practitioners working in the forensic science workplace.</p>	<p><b><u>Starting Work in the Science Sector – unit 1</u></b></p> <p>In this unit pupils will explore the requirements for starting work in the science sector which offers a wide range of job opportunities. Pupils will find out about organisations that use science such as hospital trusts, plastic, glass, cement or paint manufacturers. There is a wide range of job roles for people employed in science-based organisations. Pupils will explore the scientific activities of local organisations and examine available jobs. They will investigate the skills and personal qualities needed for employment in the science sector. These include the ability to follow health and safety procedures.</p>	<p><b><u>Growing plants for Commerical Use – Unit 6</u></b></p> <p>The unit develops pupil's knowledge and the practical skills required to carry out successful plant experiments. To grow plants successfully pupils must research and determine the conditions that aid optimal growth. They will be introduced to factors that affect plant growth and will explore ways in which to obtain optimum plant growth or yield. Pupils will investigate the conditions fundamental for the successful growth of a variety of plant types, for example types of soil, water, pH, minerals, fertilisers, growth medium, pesticides, light and temperature. They will also consider the importance of organic techniques as a way of understanding the effects of commercial plant growth on the Earth and the environment, together with the views of society on these issues.</p>	<p><b><u>Environmental Science project</u></b></p> <p>This project has been designed to give pupils an understanding of the world around them and why it is important to contribute to lowering the carbon footprint. Pupils will be able to explain the causes and effects of acid rain and explain the effects of acid on limestone. Pupils will use their research skills to be able to explain what is meant by global warming and how it is caused.</p> <p>Using the information gained pupils will then be able to complete an assessment based on their learning.</p>	<p><b>Recap on learning Completing missing units (if any) Signing paperwork ready to be sent to the examiners.</b></p>
<i>How will it be assessed?</i>	<p>Pupils work will be marked every three lessons with a yellow feedback form attached, this will give pupils information on <b>WWW</b> and <b>EBI</b>, pupils will also be expected to respond to teacher feedback, improving their work.</p> <p>Weekly Kahoot quiz – The quiz will be based on the content delivered to pupils that week.</p> <p>At the end of each unit of work an assessment sheet will be added, this informs pupils if the criteria have been achieved and if not how to improve their work.</p>					

<p><i>Why are we doing this now? How does this build on prior knowledge and the knowledge still to come?</i></p>	<p>This unit aims to give pupils an understanding of the most significant factors affecting health and an awareness of the causes of particular diseases.</p>	<p>This unit aims to develop pupils skills, understanding and knowledge of scientific procedures by applying biological, chemical and physical analytical techniques to forensic science case studies.</p>	<p>Provides pupils with information to develop an awareness of the different types of job available in the science sector. They will also explore the skills and personal qualities that such jobs require.</p>	<p>It is important that pupils realise that growing plants is an important industry as plants are a source of a wide range of things including food, medicines, dyes, flavours and aromatic oils.</p>	<p>Provides pupils with information to develop an awareness of the affect humans are having on the environment.</p>	
<p><i>Weekly Focus</i></p>	<ol style="list-style-type: none"> <li>1.What is Health?</li> <li>2.Different types of disease</li> <li>3.Factors that can affect an individual's health</li> <li>4.Causes of communicable diseases</li> <li>5.Causes of non-Communicable diseases</li> <li>6.How to limit the spread of disease</li> <li>7.Assessment</li> </ol>	<ol style="list-style-type: none"> <li>1.Role and responsibilities of employees</li> <li>2. Types of forensic evidence</li> <li>3.Follow methods to detect forensic evidence</li> <li>4.Record forensic evidence</li> <li>5.Collect forensic evidence</li> <li>6.Analyse evidence</li> <li>7.Follow Scientific procedures used to identify evidence</li> </ol>	<ol style="list-style-type: none"> <li>1.Organisations that use science</li> <li>2.compare and contrast scientific activities of local organisations</li> <li>3. Roles in the science sector</li> <li>4.Specific skills and personal qualities needed for scientific job roles</li> <li>5.Terms and conditions of jobs in the science sector</li> <li>6. Assessment</li> </ol>	<ol style="list-style-type: none"> <li>1.Factors that affect plant growth</li> <li>2.Grow a plant under suitable conditions</li> <li>3.Measure and record the plants growth at appropriate intervals</li> <li>4.Report the evidence</li> <li>5.Suggest an improvement to the method and identify customer demand</li> <li>6.Costs of growing the plant commercially.</li> </ol>	<ol style="list-style-type: none"> <li>1.Causes of acid rain</li> <li>2.Explain the effects of acid on limestone</li> <li>3.Explain global warming</li> <li>4. Research task</li> <li>5. Presentation to class</li> <li>6. Assessment</li> </ol>	