




Science Curriculum Map	
<p><b>Endeavour Federation Curriculum vision</b></p> 	<p>At the Endeavour Federation, we follow an adapted National Curriculum, with wellbeing central to everything we do. We offer a broad and balanced curriculum, with all students having the opportunity to study a range of subjects, following bespoke pathways. The study of these subjects, allows pupils to apply theoretical knowledge to the practical elements of the curriculum.</p> <p>We believe in all our students and have high expectations for their futures. A comprehensive package of both pastoral and learning support, delivered by highly trained staff, allows them to navigate their learning journeys and improve their life outcomes, becoming the best versions of themselves.</p>
<p><b>Science vision</b></p> 	<p>Our vision aims for students to develop a sound knowledge of a range of key scientific concepts which will be built on throughout the curriculum. A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils will be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, analyse causes, encourage creativity and problem solve.</p>

Careers (CEIAG)	Cultural Capital	Enrichment Opportunities	Preparing for life in modern Britain	Literacy and Communication
				



Curriculum 'at a glance'




	Autumn		Spring		Summer	
KS2 Year 1	Plants	Living things and their habitats	Properties and changes of materials	Rocks	Forces	Light and sound
KS2 Year 2	Animals, including humans	Electricity	Evolution and Inheritance	Earth and Space	States of matter	Researching Scientists and inventors
Year 7	Cells – the Building Blocks of Life	Mixing, Dissolving and Separating	Forces and their effects	Eating, Drinking, Breathing	Elements, compounds and reactions	Energy Transfers and sound
Year 8	Getting the energy Your Body Needs	Explaining Physical Changes	Exploring Contact and Non-Contact Forces	Looking at Plants and Ecosystems	Explaining Chemical Changes	Magnetism and Electricity
Year 9	Variation and Inheritance	Obtaining Useful Materials	Motion on Earth and in Space	Our Health and the Effects of Drugs	Using our Earth Sustainably	Waves and Energy Transfer
Year 10	Unit 2 – Chemistry and our Earth  Investigate chemical reactivity and bonding	Unit 3 – Energy and Our universe  Understand ionising radiation, its uses and sources	Unit 4 – Biology and our environment  Investigate the relationships different organisms have with each other and their environment	Unit 2 – Chemistry and our Earth  Investigate the factors involved in the rate of chemical reactions and the factors affecting the earth's environment	Unit 3 – Energy and our universe  How electrical energy produced from different sources are transferred to homes and industry	Unit 4 – Biology and our environment  Investigate the relationships different organisms have with each other and their environment
Year 11	Unit 1 - Principles of applied science – Biology	Unit 1 - Principles of applied science – Chemistry	Unit 1 - Principles of applied science – Physics	Course work catch up  Unit 2 – Chemistry and our Earth Unit 3 – Energy and our universe Unit 4 – Biology and our environment		




Year 7 Curriculum Planning – Science						
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<p><b>Weekly focus</b></p> <p><i>Core Knowledge, Skills and Concepts</i></p> 	<p><b><u>Cells – the Building Blocks of Life</u></b></p> <p>This unit is about the structure and function of specialised plant and animal cells, organisation in multicellular organisms, different types and adaptations of unicellular organisms and how plants and humans are adapted to reproduce. They will explore linked processes, including diffusion, pollination, seed dispersal, menstruation and fertilisation. They will consider environmental factors in discussing the role of insects and reasons for their demise.</p> <p><b>Weekly Focus</b></p> <ol style="list-style-type: none"> <li>1. Comparing plant and animal cells. Describing cells.</li> <li>2. Understanding unicellular organisms</li> <li>3. Organisation in multicellular organisms</li> <li>4. Knowing how pollination leads to fertilisation</li> <li>5. The challenges facing pollinators. Formation and dispersal of seeds.</li> <li>6. Dispersal of fruit seeds, The male reproductive system</li> <li>7. The female reproductive system, fertility, puberty and how the foetus develops</li> </ol>	<p><b><u>Mixing, Dissolving and Separating</u></b></p> <p>This unit will extend and further develop their ideas on separation from KS2 – for example revisiting the use of sieving and developing this to include filtration. New separation techniques – chromatography and distillation – are introduced. Students investigate dissolving, consider solubility and apply the Law of Conservation of Mass. They are asked to apply their knowledge of changes of state and of solubility to explain their uses. Students are introduced to ideas about atoms, compounds and mixtures, including the use of simple circle models.</p> <p><b>Weekly Focus</b></p> <ol style="list-style-type: none"> <li>1. Working safely in a laboratory</li> <li>Recording experiments</li> <li>Recognising materials, substances and elements</li> <li>2. understanding water</li> <li>Dissolving</li> <li>Separating mixtures</li> <li>3. Dissolving and evaporating</li> <li>Extracting salt</li> <li>Understanding distillation</li> <li>4. what is air made of?</li> <li>Exploring chromatography</li> <li>5. Using chromatography</li> <li>6. Finding the best solvent</li> <li>7. modelling mixtures and separation</li> </ol>	<p><b><u>Forces and their effects</u></b></p> <p>This unit is about ideas of forces, friction, movement and speed. They will learn how to represent the location, size and direction of forces using arrows. They will meet situations in which forces are balanced and others in which they are unbalanced. They will also learn to identify reaction forces.</p> <p>The students will consider the effects that forces have – stretching, compressing, turning around a fulcrum, causing changes in speed or direction. They will learn that movement continues at the same speed and in the same direction unless a force acts. In analysing the force of friction, they will consider where it is desirable, where it is unwanted and how it can be increased or reduced. They will have the opportunity to investigate the effect of streamlining in order to develop their understanding of water and air resistance. The concept of speed will be explored and students will learn and practise the method for calculating it.</p> <p>This chapter offers a number of opportunities for students to relate hands-on experience to slightly more abstract ideas. They will use a range of thinking and personal skills to help their learning and support their peers.</p> <p><b>Weekly Focus</b></p> <ol style="list-style-type: none"> <li>1. Discovering and measuring forces.</li> </ol>	<p><b><u>Eating, Drinking, Breathing</u></b></p> <p>This unit is about the human digestive system and breathing system; about the role of each of the organs involved and the way that each organ is adapted to its particular function. They will learn more about a healthy diet and the consequences of not having one, and about the effects of some lifestyle choices and diseases on the breathing system. They will also learn about the links between the digestive system, breathing system and circulatory system and study how the products of digestion and breathing are exchanged in our bodies. They will also start to learn about how we use some of the products of breathing and digestion to generate energy.</p> <p><b>Weekly Focus</b></p> <ol style="list-style-type: none"> <li>1. Exploring a healthy diet</li> <li>Testing foods</li> <li>Comparing energy needs</li> <li>2. Exploring Obesity and starvation</li> <li>Deficiency diseases</li> <li>Understanding the Human Digestive System</li> <li>Understanding the start of digestion</li> <li>3. the role of digestive organs</li> <li>Introducing enzymes</li> <li>The role of bacteria</li> <li>4. How we breathe</li> <li>Measuring breathing</li> <li>5. Evaluating gas exchange in Humans</li> </ol>	<p><b><u>Elements, compounds and reactions</u></b></p> <p>This unit is about the ideas of atoms, elements and compounds, and ways that scientists represent them using symbols and formulas. They will learn how scientists have developed the Periodic Table and will start to learn about its groups, patterns and trends. Various elements are explored with regard to their different chemical and physical properties. Students will learn how to understand chemical reactions in terms of a rearrangement of atoms and how to represent these using circle diagrams, formulas and equations. They will study metals, non-metals and oxides.</p> <p>This unit offers a number of opportunities for students to investigate materials and reactions at first hand and use evidence to construct explanations. They explore evidence that reactions have occurred and how the properties of materials determine their applications.</p> <p><b>Weekly Focus</b></p> <ol style="list-style-type: none"> <li>1. Identifying metalloids</li> <li>Discovering the origin of metals</li> <li>2. Choosing elements for a purpose</li> <li>3. Combining elements</li> <li>Using models to understand chemistry</li> <li>4. Understanding what happens when an element burns</li> <li>Observing how elements react in different ways</li> <li>5. Identifying the special features of carbon</li> <li>Understanding oxidation</li> <li>6. Investigating carbonates</li> <li>Explaining changes</li> </ol>	<p><b><u>Energy Transfers and sound</u></b></p> <p>This unit is about how energy makes things happen, can be stored and transferred in many different ways. They will learn about useful and useless energy transfers. Students will learn about burning of fuels and how different fuels store and transfer different amounts of energy.</p> <p>They will be about to understand that sound energy is transmitted by waves being passed on by air particles. They will learn how echos occur, how the ear works and how animals can communicate with sounds that we can not hear.</p> <p><b>Weekly Focus</b></p> <ol style="list-style-type: none"> <li>1. Exploring energy transfers</li> <li>Understanding potential energy and kinetic energy</li> <li>Doing work</li> <li>2. Looking at dynamos</li> <li>Understanding elastic potential energy</li> <li>3. Knowing the difference between heat and temperature</li> <li>Thinking about fuels</li> <li>4. Investigating fuels</li> <li>5. Exploring sound</li> <li>Describing sound</li> <li>Measuring the speed of sound</li> <li>6. Understanding how sounds travels through materials</li> <li>Learning about the reflection and absorption of sound</li> <li>Hearing sounds</li> <li>7. Understanding factors affecting hearing</li> <li>Finding out about sounds we cannot hear</li> </ol>

			<p>Understanding weight on other planets. Exploring the effects of forces</p> <p>2.understanding stretch and compression Hooke’s Law 3.friction The benefits of friction 4.air and water resistance Streamlining Forces and motion 5.how forces affect speed and direction speed calculations 6.turning forces moments</p>	<p>Investigating Diffusion 6.Exploring the effects of disease and lifestyle</p>		
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Year 8 Curriculum Planning – Science

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<p><b>Weekly focus</b></p> <p><i>Core Knowledge, Skills and Concepts</i></p>  	<p><b><u>Getting the energy Your Body Needs</u></b></p> <p>1.Exploring the human skeleton Analysing the skeleton Understanding the role of skeletal joints 2. Investigating muscle strength Analysing muscle strength Examining interacting muscles 3. Exploring problems with the skeletal system Understanding how our muscles get energy 4. Investigating respiration Analysing adaptations for respiration 5.Interrogating links between respiration and body systems Exploring respiration in sport 6. Understanding anaerobic respiration Investigating fermentation 7. Comparing aerobic and anaerobic respiration</p>	<p><b><u>Explaining Physical Changes</u></b></p> <p>1. Using particles to explain matter Understanding solids Exploring Brownian motion 2. Understanding liquids and gases Changing state Understanding evaporation 3. Exploring thermal expansion. Making sense of models 4. Explaining density of solids and liquids Explaining the density of gases 5. Explaining concentration and pressure Exploring diffusion 6. Conserving mass Deciding between physical and chemical changes 7. Explaining the properties of mixtures. Using particle models</p>	<p><b><u>Exploring Contact and Non-Contact Forces</u></b></p> <p>1. Understanding magnetic fields Investigating static charge 2. Explaining static charge Understanding electric fields Applying what we know about electrostatics 3. Exploring gravity on Earth Applying our understanding of gravity to space travel 4. Exploring pressure on a solid surface Calculating pressure 5. Exploring pressure in a liquid Explaining floating and sinking 6. Exploring pressure of a gas Working with pressure</p>	<p><b><u>Looking at Plants and Ecosystems</u></b></p> <p>1. Understanding the importance of plants Exploring how plants make food Looking at leaves 2. Exploring the role of stomata Investigating photosynthesis 3. Exploring the movement of water and minerals in plants Investigating the importance of minerals to plants Making food differently 4. Transferring energy Exploring the importance of insects Looking at other examples of interdependence 5. Interacting with the environment Keeping a balance 6. Understanding the effects of toxins in the environment Living together</p>	<p><b><u>Explaining Chemical Changes</u></b></p> <p>1.Exploring acids Exploring alkalis Using indicators 2.Using universal indicator Exploring neutralisation Exploring neutralisation 3.Understanding salts Exploring the reactions of acids with metals Exploring the reactions of acids with carbonates 4.Investigating the effectiveness of antacids Understanding the importance of acids and alkalis 5.Exploring combustion Understanding combustion and the use of fuels 6.Exploring the effects of burning Understanding acid rain</p>	<p><b><u>Magnetism and Electricity</u></b></p> <p>1.Finding out the history of magnets Exploring magnetic materials 2.Testing the strength of magnets Describing the Earth’s magnetic field 3.Investigating electromagnetism Using electromagnetism 4.Exploring D.C. motors Investigating batteries 5.Describing electric circuits Energy in circuits 6.Explaining resistance Investigating factors affecting resistance 7.Explaining circuits using models</p>

Year 9 Curriculum Planning – Science						
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<p><b>Weekly focus</b></p> <p><i>Core Knowledge, Skills and Concepts</i></p>   	<p><b><u>Variation and Inheritance</u></b></p> <ol style="list-style-type: none"> <li>1.Exploring differences</li> <li>2.Looking closer at variation</li> <li>Exploring the causes of variation</li> <li>3.Learning about selective breeding</li> <li>Finding out how organisms survive</li> <li>4.Exploring why siblings are different</li> <li>Looking inside the nucleus</li> <li>5.Extracting DNA</li> <li>Exploring human chromosomes</li> <li>6.Passing on genes</li> <li>Looking at cloning</li> <li>7.Learning about extinction</li> </ol>	<p><b><u>Obtaining Useful Materials</u></b></p> <ol style="list-style-type: none"> <li>1.Obtaining metal ores</li> <li>Decomposing metal carbonates</li> <li>2.Displacement reactions</li> <li>Using carbon to extract iron</li> <li>3. Using carbon to extract other metals</li> <li>Explaining issues with metal extraction</li> <li>4.Understanding exothermic reactions</li> <li>Comparing endothermic and exothermic reactions</li> <li>5.Explaining ceramics and their properties</li> <li>Matching properties of ceramics to their uses</li> <li>6.Explaining natural polymers</li> <li>Using man-made polymers</li> <li>Explaining natural composites</li> <li>7.Using metal and ceramic-based composites</li> <li>Using plastic-based composites</li> </ol>	<p><b><u>Motion on Earth and in Space</u></b></p> <ol style="list-style-type: none"> <li>1.Drawing a distance–time graph</li> <li>Explaining a distance–time graph</li> <li>2.Describing relative motion</li> <li>Understanding equilibrium</li> <li>3.Exploring equilibrium</li> <li>Understanding a gravitational field</li> <li>4.Applying ideas about gravitational fields</li> <li>Looking at motion in the Solar System</li> <li>5.Describing stars and galaxies</li> <li>Explaining the effects of the Earth's orbital motion</li> <li>6.Measuring distances in the Universe</li> </ol>	<p><b><u>Our Health and the Effects of Drugs</u></b></p> <ol style="list-style-type: none"> <li>1.Exploring types of drugs.</li> <li>Understanding the impact of smoking</li> <li>2.Considering the dangers of cannabis</li> <li>Understanding the effects of alcohol</li> <li>3.Understanding the effects of other drugs</li> <li>Exploring addiction</li> <li>4.Understanding how diseases are spread</li> <li>Exploring the body's defences</li> <li>5.Exploring microbes</li> <li>Investigating the growth of bacteria</li> <li>6.Understanding antibiotics</li> <li>Understanding vaccination</li> </ol>	<p><b><u>Using our Earth Sustainably</u></b></p> <ol style="list-style-type: none"> <li>1.Understanding our atmosphere</li> <li>Exploring the effects of human activity</li> <li>2.Understanding the global warming debate</li> <li>Understanding how carbon is recycled</li> <li>3.Exploring damage to the Earth's resources</li> <li>Considering the importance of recycling</li> <li>4.Understanding the structure of the Earth</li> <li>Exploring igneous rocks</li> <li>5.Studying sedimentary rocks</li> <li>Using metamorphic rocks</li> <li>6.Understanding the rock cycle</li> </ol>	<p><b><u>Waves and Energy Transfer</u></b></p> <ol style="list-style-type: none"> <li>1.Making waves</li> <li>Exploring light waves</li> <li>2.Explaining properties of light waves</li> <li>Exploring the ray model</li> <li>3.Understanding energy transfer by light</li> <li>Exploring coloured light</li> <li>4.Understanding fuels and energy</li> <li>Explaining conduction and radiation</li> <li>5.Quantifying energy transfers</li> </ol>

Year 10 Curriculum Planning – Science						
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<p><b>Weekly focus</b></p> <p><i>Core Knowledge, Skills and Concepts</i></p>   	<p><b>Unit 1 – Principles of applied Science</b> 1.Cells – Structure and function Specialised cells</p> <p><b>Unit 2 – Chemistry and our Earth (Investigate chemical reactivity and bonding)</b> In this unit you will: A investigate chemical reactivity and bonding B investigate how the uses of chemical substances depend on their chemical and physical properties C investigate the factors involved in the rate of chemical reactions D understand the factors that are affecting the Earth and its environment</p> <p>2.Atoms and atomic structure and the periodic table</p> <p>3. Types of bonding</p> <p>4. Group 1 and Group 7 – Properties and trends</p> <p>5. Physical properties and uses of chemicals, word equations and chemical equations</p> <p>6.Properties of ionic and covalent substances</p> <p>7. Physical and chemical properties, Fractional Distillation Suitability of substance for their uses Concentration investigation Particles size investigation</p>	<p><b>Unit 1 – Principles of applied Science</b> 1. Atomic structure, Isotopes and relative atomic mass</p> <p><b>Unit 3 – Energy and Our universe (Understand ionising radiation, its uses and sources)</b> In this unit you will: A understand ionising radiation, its uses and sources B know how electrical energy produced from different sources can be transferred through the National Grid to homes and industry C know the components of the Solar System, the way the Universe is changing and the methods we use to explore space.</p> <p>2. Ionising radiation</p> <p>3. Radioactive decay and half life</p> <p>4. Uses of ionising radiation</p> <p>5. Nuclear fission</p> <p>6. Safety in nuclear reactors</p> <p>7 Nuclear Fusion</p> <p>8. Investigating electrical circuits</p>	<p><b>Unit 4 – Biology and our environment (investigate the relationships different organisms have with each other and their environment)</b> In this unit you will: A investigate the relationships that different organisms have with each other and with their environment B demonstrate an understanding of the effects of human activity on the environment and how these effects can be measured C explore the factors that affect human health</p> <p>1. Variation</p> <p>2. Evolution</p> <p>3. Interdependence</p> <p>4. Classification and Keys</p> <p>5. Agriculture and ecosystems</p> <p>6. Transportation and ecosystems</p>	<p><b>Unit 1 – Principles of applied Science</b> 1. The periodic table, Elements, Compounds and Mixtures</p> <p><b>Unit 2 – Chemistry and our Earth (Investigate the factors involved in the rate of chemical reactions and the factors affecting the earth's environment)</b> In this unit you will: A investigate chemical reactivity and bonding B investigate how the uses of chemical substances depend on their chemical and physical properties C investigate the factors involved in the rate of chemical reactions D understand the factors that are affecting the Earth and its environment</p> <p>2. Rates of reaction – Concentration, pressure and surface area.</p> <p>3.. Rates of reaction – Temperature of catalysts</p> <p>4. Industrial Processes - Yield and atom economy</p> <p>5. Our changing atmosphere and oceans</p> <p>6. The effect of human activity</p> <p>7. Sustainable development – choice and solutions</p>	<p><b>Unit 1 – Principles of applied Science</b> 1. Energy and it's uses Energy transformations and transfers Wave Characteristics Electromagnetic Spectrum and its uses</p> <p><b>Unit 3 – Energy and our universe (Know how electrical energy produced from different sources are transferred to homes and industry)</b> In this unit you will: A understand ionising radiation, its uses and sources B know how electrical energy produced from different sources can be transferred through the National Grid to homes and industry C know the components of the Solar System, the way the Universe is changing and the methods we use to explore space.</p> <p>2. Power- The National Grid, Transformers</p> <p>3. A journey into our solar system The Universe, solar system and stars</p> <p>4. Optical Telescopes and Other Telescopes 6.Space Telescopes and Space Probes and Robots 7. The changing universe - Waves of the EM Spectrum Red shift 8. Cosmic Microwave Background Radiation, The Death of Stars 9 The origin of the universe: The Big bang</p>	<p><b>Unit 4 – Biology and our environment (Investigate the relationships different organisms have with each other and their environment)</b> In this unit you will: A investigate the relationships that different organisms have with each other and with their environment B demonstrate an understanding of the effects of human activity on the environment and how these effects can be measured C explore the factors that affect human health</p> <p>1. How fertilisers affect ecosystems Pesticides and ecosystems</p> <p>2. Pollution indicators Lichen, Freshwater shrimps and algae</p> <p>3.Reducing the effects of pollution</p> <p>4. Infectious disease</p> <p>5. Vaccination and Antibiotics</p> <p>6. Lifestyle, environment and diseases</p> <p>7. Physical activity keeps the body healthy</p>



Year 11 Curriculum Planning – Science						
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<p><b>Weekly focus</b></p> <p><i>Core Knowledge, Skills and Concepts</i></p>   	<p><b>Unit 1 - Principles of applied science</b></p> <p>In this unit pupils will: explore cells, organs and genes, explore the roles of the nervous and endocrine systems in homeostasis and communication, explore atomic structure and the periodic table, explore substances and chemical reactions, explore the importance of energy stores, energy transfers and energy transformations, explore the properties and applications of waves in the electromagnetic spectrum.</p> <p>1. Cells – Structure and function 2. Specialised cells 3. Organs and organ system 4. DNA and Chromosomes 5. Monohybrid inheritance 6. Homeostasis, with examples 7. How nerves carry information</p>	<p><b>Unit 1 – Principles of applied Science</b></p> <p>1. Atomic structure, Isotopes and relative atomic mass 2. The periodic table, Electronic configurations 3. Elements, Compounds and Mixtures 4. Neutralisation reactions 5. Acids and Salts, Equations for neutralisation reactions 6. Acids and metals, acids and Carbonates 7. Hazards of acids and bases</p>	<p><b>Unit 1 – Principles of applied Science</b></p> <p>1. Energy and its uses 2. Energy transformations and transfers 3. Thermal energy transfer. Measuring energy 4. Energy for everything, sources of renewable energy 5. Wave Characteristics Electromagnetic Spectrum and its uses <u>6. Assessment</u> <i>Mock exam past paper taken from Pearson's</i></p>	<p>Teacher to analyse pupil data and assess which units' pupils need to complete/achieve a higher grade.</p> <p>Unit 2 – Chemistry and our Earth Unit 3 – Energy and our universe Unit 4 – Biology and our environment</p> <p>This information should be included in T&amp;L files</p>	<p><i>Revision sessions</i></p> <p><i>Intervention sessions</i></p> <p><i>Final Exam – BTEC LEVEL 1 /2 Principles of Applied Science</i></p> <p><b>Recap on learning</b> <b>Completing missing units (if any)</b> <b>Signing paperwork ready to be sent to the examiners.</b></p>	