Year 8 Science Curriculum End Points and Key Vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Units of Work	1. Reactions – Acids and Alkalis 2. Energy - Energy	1. Organisms – Breathing 2. Organisms – Digestion 3. Matter – Elements and Compounds	1. Genes – Evolution and Inheritance 2. Waves – Sound	1. Forces – Pressure 2. Electromagnets – Magnets and Electromagnetism	1. Energy – Work, Heating and Cooling 2. Reactions – Chemical Energy and Types of Reaction	1. Ecosystems – Respiration 2. Ecosystems – Photosynthesis 3. Earth – Climate and the Earth's Resources
Ethos Links	**STEM –** understanding how substances behave **STEM** – energy stores and transfers, **Sust** – generating electricity, renewable and non-renewable resources	**STEM** – explaining how the body works, evaluating models **STEM** – explaining how the body works, designing a menu. **Sust.** – making food choices **STEM** – Representing elements and compounds	**STEM** – explaining changes in population, genetic engineering. **Sust.** – responsible breeding, endangered and extinct animals **STEM** – soundproofing, considering implications when planning fire work displays. **Char. –** Use of alarms to reduce antisocial behaviour	**STEM** – designing shoes for different situations **STEM** – designing an electromagnet for a purpose	**STEM, Sust. -** Designing houses to reduce energy loss, using levers in machines and to lift heavy loads **STEM –** Explaining chemical reactions, uses of exothermic and endothermic reactions in different products **Sust.** – efficiency in combustion reactions	**STEM** – Explaining how the body works, use of respiration in food production **STEM, Sust.** – designing a greenhouse to maximise food growth **STEM** – Effects of climate change. **Sust. –** Causes/effects/solutions of climate change
Learning End Points	By the end of this unit students will know and understand: <u>Reactions – Acids and Alkalis</u> - What acids and alkalis are - What pH is and how it can be measured - How to name salts - What neutralisation is and some everyday examples of where it might be used. <u>Energy – Energy</u>	By the end of this unit students will know and understand: <u>Organisms – Breathing</u> - What breathing is and how our body moves air into and out of our lungs - What gas exchange is and how the respiratory system is adapted to maximise gas exchange - What lung volume is, how it can be measured and factors which affect it. <u>Organisms – Digestion</u>	By the end of this unit students will know and understand: <u>Genes – Inheritance and Evolution</u> - What biodiversity is and why it is important - How natural selection occurs and why it is important - What causes extinction and the repercussions this may have - What selective breeding is, how it works and why it is important - What genetic engineering is, how it	By the end of this unit students will know and understand: <u>Forces – Pressure</u> - How to calculate pressure on a solid and what things effect pressure - How products are designed with pressure in mind to be suitable for different situations - What causes fluid pressure, including gases and liquids, and why pressure changes with increasing altitude or depth. - <u>Electromagnets – Magnets and Electromagnetism</u>	By the end of this unit students will know and understand: <u>Energy – Work, Heating and Cooling</u> - What work done is and how to calculate it - What temperature and heat are - How thermal energy can be passed on through conduction, convection and radiation, in solids, liquids, gases and a vacuum.	By the end of this unit students will know and understand: <u>Ecosystems – Respiration</u> - What respiration is and why it is important - The differences between aerobic and anaerobic respiration and fermentation <u>Ecosystems – Photosynthesis</u> - What photosynthesis is

	- The 8 energy stores and how energy is transferred - The law of conservation of energy - How energy can be released from the chemical store in food and how we can measure that - How electricity is generated from renewable and non-renewable resources, as well as advantages and disadvantages of this - How to calculate power and the cost of energy.	- What digestion is, the parts of the digestive system and how they are adapted for their function. - The nutrients needed for a balanced diet and the foods they are found in - The consequences of an unbalanced diet, including some deficiency diseases and their causes and symptoms. <u>Matter – Elements and Compounds</u> - The words element, molecule, atom, mixture and compound - How symbols are used to represent elements and compounds - Naming simple compounds made from a metal and non-metal - How some groups of elements make up a sulfate, nitrate or carbonate. - How polymers are useful to us and how they can have negative effects on the environment	happens and why it is important - The structure of DNA and the work that led to its discovery. <u>Waves – Sound</u> - How sound travels in terms of particles and in solids, liquids, gases and in a vacuum - How waves can be viewed and how their form changes when the sound changes - How the ear works and causes or permanent and temporary hearing loss.	- Magnets and magnetic field, including plotting the magnetic field of a bar magnet - The Earth's magnetic field - What electromagnets are and how to build them and factors affecting the strength of electromagnets	<u>Reactions – Chemical Energy and Types of Reaction</u> - The difference between chemical reactions and physical changes - What exothermic and endothermic reactions are - The differences between complete and incomplete combustion, why they happen, which is preferrable and risks of them - What happens in a thermal decomposition reaction	and why it is important - Where photosynthesis happens, how the reactants get to the leaf, and how the products are removed from the leaf - How to test a leaf for starch - The structure of a leaf and how this helps it to do photosynthesis - The limiting factors for photosynthesis and how conditions can be controlled to maximise plant growth - The nutrients needed by plants for healthy growth and how to diagnose deficiencies <u>Earth – Climate and the Earth's Resources</u> - The composition of the current atmosphere, the early atmosphere, and what caused the changes - How carbon is recycled through the atmosphere and living organisms in the carbon cycle. - The causes and effects of the enhanced greenhouse effect and global warming.

						- Finite and renewable resources from the Earth and how they are obtained.
	By the end of this unit students will be able to: <u>Reactions – Acids and Alkalis</u> - Write word equations to represent chemical reactions - Write a method including naming equipment correctly (WS2.3) <u>Energy – Energy</u> - Use equipment safely to measure temperature changes - Suggest improvements to experimental methods and comment on the accuracy of conclusions. (WS2.7) - Compare the economic and environmental implications of different energy resources (WS1.4)	By the end of this unit students will be able to: <u>Organisms – Breathing</u> - Make predictions - Draw a line of best fit, with support - Evaluate models such as the bell jar model of lungs. - Identify further questions from the results of an experiment <u>Organisms – Digestion</u> - Construct comparative sentences - Evaluate claims in the media <u>Matter – Elements and Compounds</u> - Name compounds from their formulae (WS4.3) Relate the function of a polymer to its physical and chemical properties	By the end of this unit students will be able to: <u>Genes – Inheritance and Evolution</u> - Develop an understanding of why scientific theories develop over time (WS1.1) - Consider ethical issues arising from GM and selective breeding, and make an informed opinion (WS1.3) <u>Waves – Sound</u> - Use a computational representation of a wave (WS1.2)	By the end of this unit students will be able to: <u>Forces – Pressure</u> - Convert cm^2 to m^2 - Use an equation to calculate pressure - Use decimals and an appropriate number of significant figures - Apply mathematical concepts to observations <u>Electromagnets – Magnets and Electromagnetism</u> - Plan and carry out an experiment and collect results - Evaluate data in terms of accuracy, repeatability and reproducibility	By the end of this unit students will be able to: <u>Energy – Work, Heating and Cooling</u> - Carry out investigations into conduction with due regard for health and safety. - Plot several sets of data on the same axis to compare results - Draw simple conclusions backed up by experimental data. <u>Reactions – Chemical Energy and Types of Reaction</u> - Comment on combustion data in terms of accuracy, repeatability and reproducibility and identify sources of error (WS3.7) - Manipulate complex apparatus to conduct an investigation into thermal decomposition	By the end of this unit students will be able to: <u>Ecosystems – Respiration</u> - Develop mostly accurate and logical descriptions, which include some relevant detail and simple explanations <u>Ecosystems – Photosynthesis</u> - Develop logical explanations for practical observations <u>Earth – Climate and the Earth's Resources</u> - Use percentages (MS1c) - Understand how scientific theories develop over time (WS1.1) - Explain technological applications of science and begin to evaluate the environmental implications
Key Vocabulary	Frequency Amplitude Vibration Vacuum Acid Alkali Neutralisation Salt Energy store	Gas exchange Breathing Digestion Small intestine Adaptation Nutrient Deficiency Formula Polymer	Biodiversity Natural selection Evolution Extinction Selective breeding Genetic modification DNA	Pressure Fluid Altitude Magnetic field Electromagnet Core Solenoid	Conduction Convection Radiation Work done Exothermic Endothermic Combustion Thermal decomposition Repeatable	Aerobic Anaerobic Respiration Glucose Photosynthesis Starch Chlorophyll Stomata Atmosphere

	Transfer Energy resource				Reproducible	Finite Renewable Reduction Electrolysis Greenhouse effect