Year 8	Initial Unit: Autumn Term 1
	Science in the Media
	Students are taught to pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility They understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review

Year 8	Biology	Autumn 1 – 7 weeks	Autumn 2 – 7 weeks	Spring 1 – 6 weeks	Spring 2 – 5/6 weeks	Summer 1 – 5/6 weeks	Summer 2- & weeks
	Course topic	**Genetics and Evolution**		**Reproduction**		**Photosynthesis and Respiration**	
	Powerful/Core Knowledge **Including key people and stories**	Students build on their knowledge of variation from year 7 as a way to help organisms survive in difficult environments. Students then learn about how they inherit characteristics from parents through genetic material, and how mutations can occur. Students look at how organisms that exist today have evolved, and how scientists are trying to prevent further species from becoming extinct. ***Rosalind Franklin*** *- British Chemist and X-ray Crystallographer who made significant contributions to the discover of the structure of DNA.* ***Mary Anning*** *- Pioneering palaeontologist and fossil collector discovered fossils of pterosaur, ichthyosaur and plesiosaur.*		Students learn about 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 fetus through the placenta. Students learn the basics of IVF being a medical treatment that some people may have to help them conceive children. In addition to learning about reproduction in humans students also learn about reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms ***Jean Purdy*** *- the world's first female embryologist*		Students build on their knowledge of Photosynthesis from KS2 focusing on the reactants in, and products of, photosynthesis, and a word summary for photosynthesis. They understand that 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. They look at the adaptations of leaves for photosynthesis. Students build on their knowledge of aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life. They look at the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration. Students should be able to articulate the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism	

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Chemistry	Autumn 1 – 7 weeks	Autumn 2 – 7 weeks	Spring 1 – 6 weeks	Spring 2 – 5/6 weeks	Summer 1 – 5/6 weeks	Summer 2- & weeks
Course topic	**Earth Structure and Rock Cycle**		**Climate and resources**		**Metals & Non-metals, Acids & Alkalis**	
Powerful/Core Knowledge **Including key people and stories**	Students will further their understanding of the structure and composition of the Earth. They will look at the formation and classification of Igneous, Metamorphic and Sedimentary rocks. They will look at how biological, physical and chemical weathering and erosion contribute to the rock cycle. There will be cross links to Geography and the work completed there. ***Inge Lehmann*** *- was a prominent Danish seismologist and geophysicist, proposed in 1936 that the Earth's core is composed of two parts: a solid metal core surrounded by an outer liquid core, overturning the accepted theory of an entirely liquid core*		Students understand the impact that humans have on the world around them, looking at how Global warming occurs including the effects of extracting metals using Carbon and electrolysis. Students look at the evidence behind climate change and explore the different parts of the carbon cycle.		From KS2 and Year 7 students have learnt the basics of pH. They will build on the foundations they have learnt about Chemical symbols and formulae for elements and compounds and be able to articulate the differences between atoms, elements and compounds. Students will be able to list the differences in properties between Metals and Non-metals and apply this knowledge to alloy formation. Building on their knowledge of substances they will look at conservation of mass, changes of state and chemical reactions. They will revisit their knowledge of chemical reactions as the rearrangement of atoms and representing chemical reactions using formulae and using equations. New knowledge will include oxidation and displacement reactions. They will be able to define acids and alkalis in terms of neutralisation reactions and the pH scale for measuring acidity/alkalinity; and indicators. Students will be able to apply this knowledge to reactions of acids with metals to produce a salt plus hydrogen as well as reactions of acids with alkalis to produce a salt plus water	

Year 8	Physics	Autumn 1 – 7 weeks	Autumn 2 – 7 weeks	Spring 1 – 6 weeks	Spring 2 – 5/6 weeks	Summer 1 – 5/6 weeks	Summer 2- & weeks
	Course topic	**Sound and Light**		**Space**		**Electricity and Electromagnetism**	
	Powerful/Core Knowledge **Including key people and stories**	Students will build upon their knowledge of waves that they learnt in year 7. In this unit specifically the focus will be on Sound and light waves. With Sound waves students will learn about Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound. They will learn that Sound needs a medium to travel and the speed of sound in air, in water, in solids. Sound is produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. Students will learn about the similarities and differences between light waves and waves in matter. Light waves travelling through a vacuum; speed of light. The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. Students will carry out practicals looking at the use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and look at how colours can be seen.		Students will learn about the study of space and space exploration in particular the focus around Space X, They will deepen their knowledge about the history of our story around solar systems and learn about planets, years and orbits. Students will learn how satellites work and their uses in everyday life. They will build on their knowledge from KS2 about how day, night and seasons occur and learn about the phases of the moon. To engage students with outside learning we will teach them about Constellations and they will debate on the future of space exploration. ***Maggie Adrein-Pocock**- She worked on aircraft missile warning systems, hand-held instruments to detect landmines and improving telescopes to study distant stars* ***Katherine Johnson**- a brilliant mathematician who helped to calculate the trajectories of spacecrafts, including the first manned mission to the moon. Katherine also helped break down barriers for women and African Americans in the field of math and science,* ***Rebecca Oppenheimer**- astrophysicist whose lab focuses on new technology with the goal of studying planets that orbit stars other than the sun & LGBTQ activist* ***Kalpana Chawla**- first Indian born woman in space*		Students will build upon the knowledge they have on Electricity from KS2. They will focus on current electricity specifically on how electric current, is measured in series and parallel circuits and what happens to currents where branches meet and current as flow of charge They will look at what potential difference is and how varies in battery and bulb ratings. Students will learn that Static electricity is the separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects Students learn about Magnetism specifically about magnetic poles, attraction and repulsion. They learn about magnetic fields by plotting with compass, representation by field lines and about the Earth's magnetic field. They apply this knowledge to how electromagnets are made and uses of them.	