Science at the Hart School

Yr 8 Curriculum overview

Curriculum intent: Science encompasses everything that we are and allows us to make sense of the world around us. Science at The Hart School is more than just a core subject. We believe an outstanding science education should develop students' curiosity and scientific knowledge to question the world in which we live, enable critical-thinking and encourage students to become socially aware global citizens.

Our Science faculty has planned an inspiring, inclusive, and diverse curriculum that is designed to engage and enthuse students with the real-life applications of the subject whilst promoting ambition and aspirations for their future.

In an ever-changing world, in which STEAM subjects are at the forefront of advancements for the future, we want to prepare our students for this by not only looking at the knowledge of the subject, but also the methods, processing skills and applications associated with it. This ensures that our students are scientifically literate, able to evaluate what they see in the news and the world around them and make informed decisions that will affect their future lives and the planet.

	Autumn 1		Autumn 2			Spring 1	Spring 2		Summer 1			Summer 2
These topics are taught in small bitesize chunks and revisited regularly.	**Intro to Science - Science in the media**	**Genetics & evolution**	**Earth structure & rock cycle**	**Sound & light**		**Reproduction**	**Climate & resources**	**Space**	**Photosynthesis & respiration**	**Metals, non-metals, acids & alkalis**		**Electricity & electromagnetism**
Additional support links: Here are links to additional resources which will help your child	KS3 working scientifically support - BBC bitesize	KS3 Genetics support - BBC bitesize	KS3 Earth structure support - BBC bitesize KS3 Rock cycle support - BBC bitesize	KS3 light waves support - BBC bitesize KS3 Sound waves support - BBC bitesize		KS3 Reproduction support BBC bitesize	KS3 Climate support - BBC bitesize	KS3 Space support - BBC bitesize	KS3 Photosynthesis support - BBC bitesize KS3 Respiration support - BBC bitesize	KS3 Metals and non-metals support - BBC bitesize KS3 Acids and Alkalis support - BBC bitesize		KS3 Electricity support - BBC bitesize KS3 Electromagnetism support - BBC bitesize
Knowledge: Included here is the specific knowledge your child will learn in detail	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	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.	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.	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. 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.	**Assessment 1**	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	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.	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.	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	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. 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	**Assessment 2**	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. S 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.
Working Scientifically Skills: Included here is the specific skills your child will learn in detail	Review theories, Interrogate sources		Draw conclusions	Analyse patterns, Test hypothesis			Method writing		Analyse patterns, Draw conclusions, Present data, Construct explanations, Test hypothesis	Analyse patterns, Draw conclusions, Collect data, Test hypothesis, Estimate risk		Analyse patterns, Discuss limitations, Draw conclusions, Present data, Plan variables, Test hypothesis
Home learning online platform	https://www.carousel-learning.com/											