

The Hart School - Faculty of Science

Yr 9 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	
Core Course Topic: These topics are taught in small bitesize chunks and revisited regularly.	Intro to Science - Maths in Science	Health	Types of Reaction	Assessment 1	Heating and Cooling	Ecosystems	Wave Interactions	Assessment 2	Chemical Energy	Cell Biology	Forces and Machines	Fundamental Chemistry	Assessment 3	Energy Core Concepts
Additional support links: Here are links to additional resources which will help your child	KS3 working scientifically support - BBC bitesize	KS3 Health and disease support - BBC bitesize	KS3 Reactions support - BBC bitesize		KS3 Heating and cooling support - BBC Bitesize	KS3 Ecosystems and habitats support - BBC bitesize	KS3 Waves support - BBC bitesize		KS3 Exothermic and endothermic reactions support - BBC bitesize	KS3 Cells and organisation support - BBC bitesize	KS3 Forces and motion support - BBC bitesize	KS3 Periodic table and properties support - BBC bitesize		KS3 Energy Support - BBC bitesize
Knowledge: Included here is the specific knowledge your child will learn in detail	This topic builds on mathematical concepts and skills the students have learnt in lower KS3 and KS2. It has been placed at the beginning of year 9 to enable to students to have the mathematical and scientific skills to access the KS3 Year 9 curriculum and beyond. Students will be able to apply mathematical concepts and calculate results. They will rehearse how to present observations and data using appropriate methods, including tables and graphs. They will be able to interpret observations and data to draw conclusions.	Health is the state of physical, mental and social well-being. It is not just being free from disease . Factors can work together to affect physical and mental health. Lifestyle choices such as smoking, drinking alcohol and taking drugs has an impact on the body. Exercise is a key way in ensuring that our bodies stay healthy. A Pathogen is a microorganism that can cause disease. Microorganisms are tiny organisms that can only be seen using a microscope. Students will look at how microorganisms can spread from person to person and look at the work of Ignaz Semmelweis and Edward Jenner.	Understanding of chemical changes began when people began experimenting with chemical reactions in a systematic way and organizing their results logically. Knowing about these different chemical changes meant that scientists could begin to predict exactly what new substances would be formed and use this knowledge to develop a wide range of different materials and processes. The extraction of important resources from the earth makes use of the way that some elements and compounds react with each other and how easily they can be 'pulled apart'.		Temperature is a measure of how hot things are and therefore their thermal energy. Substances will change state when the particles have enough energy to overcome the forces. Students will further develop their knowledge of how substances get warmer and cooler.	Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others. The population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients. Plants have adaptations to disperse seeds using wind, water or animals. Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary	Waves are one of the ways in which energy may be transferred between stores. It is an oscillation or vibration that transfers energy without transferring any material Students will learn more about the frequency and apply the equation. A focus on light waves including reflection, refraction and dispersion of light will be delivered		Students develop their understanding of chemical reactions by looking at exothermic and endothermic reactions and energy profiles. They then look at real world applications of catalysts in industry and identify the benefits and disadvantages of them.	Cells have become specialised. These small structures were first observed with the discovery of light microscopes and further enhanced due to the evolution of electron microscopy. A variety of processes are required to transport substances into and out of cells such as diffusion, osmosis and active transport and that exchange surfaces have become adapted to allow rapid exchange. DNA is the genetic material of a cell. In a nucleated cell the DNA is held in chromosomes. This allows cell division to occur more effectively.	A force causes an object to undergo a specific change. Unbalanced forces cause changes in speed, shape or direction. Students will be able to calculate work done. Students will complete a practical linked at Hooke's Law and apply their knowledge of elastic limit to this. Students then look at pressure in fluids and how this can be used to make hydraulic machines.	The periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties. The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time as new evidence emerges. The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels.		Energy is understood using a stores and transfer model. Students should be able to name the main stores and the mechanisms that transfer energy between them. Changes in energy stores can be quantified and students should be able to recall, apply and rearrange the formulae for energy in the kinetic store and the gravitational potential store. Energy can be transferred into a useful store or wasted and the proportion of the total usefully transferred describes the efficiency of the machine. Most of the electricity used in the UK is generated from burning fossil fuels but the technology exists to generate electricity from alternative renewable resources.
Skills: Included here is the specific skills your child will learn in detail					Analyse patterns, Discuss limitations, Present data, Draw conclusions, Method Writing	Analyse patterns, Discuss limitations	Analyse patterns, construct explanations, Collect data				Plan variables, collect data, Test hypothesis, Analyse patterns, Draw conclusions			

