Science at the Hart School

Yr 7 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 - Lab skills & diversity**	**Ecosystems**	**Foundations in Chemistry**	**Introduction to Physics**		**Cells and Movement**	**Earth Structure and Rock Cycle**	**Sound and Light**	**Digestion and Gas Exchange**	**Periodic Table and Elements**		**Quantifying Energy**
Additional support links: Here are links to additional resources which will help your child	KS3 working scientifically support - BBC bitesize	KS3 Ecosystems and habitats support - BBC bitesize	KS3 Particles support - BBC bitesize	KS3 Introduction to forces support - BBC bitesize		KS3 Cells and organisation support - BBC bitesize KS3 Skeletal system 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 Digestive system support - BBC bitesize KS3 Breathing and gas exchange 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	During their primary education students are used to asking questions based on observations of the real world. They will build on this knowledge and start to plan suitable experiments to test predictions, including identifying independent, dependent and control variables. Students can use appropriate techniques, apparatus, and materials during laboratory work. They make and record observations and measurements using a range of methods for different investigations.	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	Students are introduced to the concept of atoms and elements. Students will understand the differences between Elements, compounds and mixtures. Students will build on their KS2 knowledge of states of Matter and focus on changes in states including melting, freezing, boiling, evaporation and sublimation.	The universe can be thought of as an interaction between forces and energy. These are two fundamental ideas in Physics. This model of forces and energy can explain how change can happen. We can measure the sizes of forces and we can calculate how much change has happened.	**Assessment 1**	The parts of the human skeleton work as a system for support, protection, movement and the production of new blood cells. Antagonistic pairs of muscles create movement when one contracts and the other relaxes Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. There are many types of cells. Each has a different structure or feature so it can do a specific job.	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.	In gas exchange, oxygen and carbon dioxide move between alveoli and the blood. Oxygen is transported to cells for aerobic respiration and carbon dioxide, a waste product of respiration, is removed from the body. Breathing occurs through the action of muscles in the ribcage and diaphragm. The body needs a balanced diet with carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water, for its cells' energy, growth and maintenance. Organs of the digestive system are adapted to break large food molecules into small ones which can travel in the blood to cells and are used for life processes.	Students further their knowledge of what they have learnt in the autumn term and build on it by understanding that elements in the periodic table are organised according to atomic number and the differences in properties between metals and non-metals. Compounds are formed when 2 or more elements form a chemical bond. Students will learn how to write word and symbol equations.	**Assessment 2**	Energy is a quantity that is conserved - it cannot be created or destroyed. Energy can be stored and transferred. Students will learn about the following stores; Magnetic, kinetic, heat, electrostatic, gravitational, chemical, elastic potential, nuclear. Energy can be transferred between different stores of energy. When energy transfers take place in a system: the total energy stored before = total energy stored after. This is known as conservation of Energy. When energy is transferred within a system, energy can be dissipated. This is where energy is 'wasted' by being transferred out to the surroundings.
Working Scientifically Skills: Included here is the specific skills your child will learn in detail	Communicate ideas	Analyse patterns, Discuss limitations	Draw conclusions	Discuss limitations, Test hypothesis		Present data, Estimate risks	Draw conclusions	Analyse patterns, estimate risks	Draw conclusions, Construct explanations, Plan variables, Test hypothesis	Plan variables, Estimate risks		Analyse patterns, Collect data, Test hypothesis