Science at the Hart School

Yr 10 Combined Trilogy 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							Spring		Summer						
Core Course Topic: These topics are taught in	**B1: Cell biology**	**C1: Periodic table & atomic structure**	**P1: Energy**	**B2: Organisation**	**C2: Bonding & properties**	**C3: Quantitative chemistry**	**P2: Electricity**	**C4: Chemical changes**		**B3: Infection & response**	**P3: Particle model**	**B4: Bioenergetics**	**P4: Atomic structure & radiation**	**C5: Energetics**		**B7: Ecology**
Additional support links: Here are	AQA B1 support - BBC bitesize	AQA C1 support - BBC bitesize	AQA P1 support - BBC bitesize	AQA B2 support - BBC bitesize	AQA C2 support - BBC bitesize	AQA C3 support - BBC bitesize	AQA P2 support - BBC bitesize	AQA C4 support - BBC bitesize		AQA B3 support - BBC bitesize	AQA P3 support - BBC bitesize	AQA B4 support - BBC bitesize	AQA P4 support - BBC bitesize	AQA C5 support - BBC bitesize		AQA B7 support - BBC bitesize
	B1 support video playlist	C1 support video playlist	P1 support video playlist	B2 support video playlist	C2 support video playlist	C3 support video playlist	P2 support video playlist	C4 support video playlist		B3 support video playlist	P3 support video playlist	B4 support video playlist	P4 support video playlist	C5 support video playlist		B7 support video playlist
Knowledge: Included here is the specific knowledge your child will learn in detail	Cell structure, eukaryotes and prokaryotes, cell specialisation, cell differentiation, sten cells, cell division and the cell cycle, diffusion, active transport, osmosis	Atoms, elements, compounds, mixtures, seaprating techniques, development of the atomic model, sub-atomic particles, electron configurations, patterns in properties and reactivity in the periodic table	Energy stores and systems, energy changes in a system, power, conservation and disspation of energy in a system, efficiency, national and global energy resources	Animal tissues, organs and systems, the digestive system, the heart and blood vessels, coronary heart disease, health, risk factors, cancer, plant tissues and organ systems	Ionic, covalent and metallic bonding, states of matter, properties of bonding, allotropes of carbon	Conservation of mass, Relative formula mass, changes in mass when reactant or product is a gas, moles, balancing equations, limiting reactants, concentrations of solutions	Current, potential difference, resistance, resistors, series and parallel , domestic electricity, power, the national grid	Reactivity of metals, extraction of metals and reduction, reactions of acids, pH scale and neutralisation , electrolysis	**Assessment 1**	Communicable diease and pathogens, human defence systems, vaccination, development of drugs	Changes of state, the particle model, density, internal energy, energy transfers, temperature changes in a system, specific heat capacity, pressure in gases	Photosynthesis, uses of glucose, areobic and anaerobic respiration, response to escercise, metabolism	Structure of an atom, isotopes, devlopment of the model of the atom, radioactive decay, nuclear radiation, nuclear equations, contamination	Exothermic and endothermic reactions, reaction profiles, calculating enthalpy changes,	**Assessment 2**	Adaptations, interdependence , competition, organisation of ecosystems
Skills: Included here is the specific skills your child will learn in detail	**Required practical 1:** Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included.	Develop an understanding of why and how scientific methods and theories change over time.	**Required practical activity 14**: An investigation to determine the specific heat capacity of one or more materials.	**Required practical 3:** Use qualitative reagents to test for a range of carbohydrates, lipids and proteins.	Visualise and represent 2D and 3D forms including twodimensional representations of 3D objects.	Substitute numerical values into algebraic equations using appropriate units for physical quantities. Use ratios, fractions and percentages. Change the subject of an equation. Recognise and use	**Required practical activity 15:** Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits.	**Required practical activity 8:** Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.		Understand that the results of testing and trials are published only after scrutiny by peer review.	**Required practical activity 17:** Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids.	**Required practical activity 5:** Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	Students should be able to recognise expressions given in standard form.	**Required practical activity 10:** Investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, acid plus carbonates, neutralisations, displacement of metals.		Extract and interpret information from charts, graphs and tables. Biodiversity, human effects on the environment, waste management, land use, deforestation, global warming
	Use prefixes centi, milli, micro and nano. Re-arrange, and use, the magnification equation to calculate magnification. Convert units between milli, micro and nano.	Safe use of a range of equipment to separate chemical mixtures.	Recall and re-arrange equations to calculate energy changes in a system. Convert between units and express values in standard form.	**Required practical 4:** Investigate the effect of pH on the rate of reaction of amylase enzyme.			**Required practical activity 16:** Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements,					Investigations into the effect of exercise on the body.	Develop an understanding of why and how scientific methods and theories change over time.			**Required practical activity 7:** Measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species
learning online	https://www.carousel-learning.com/															