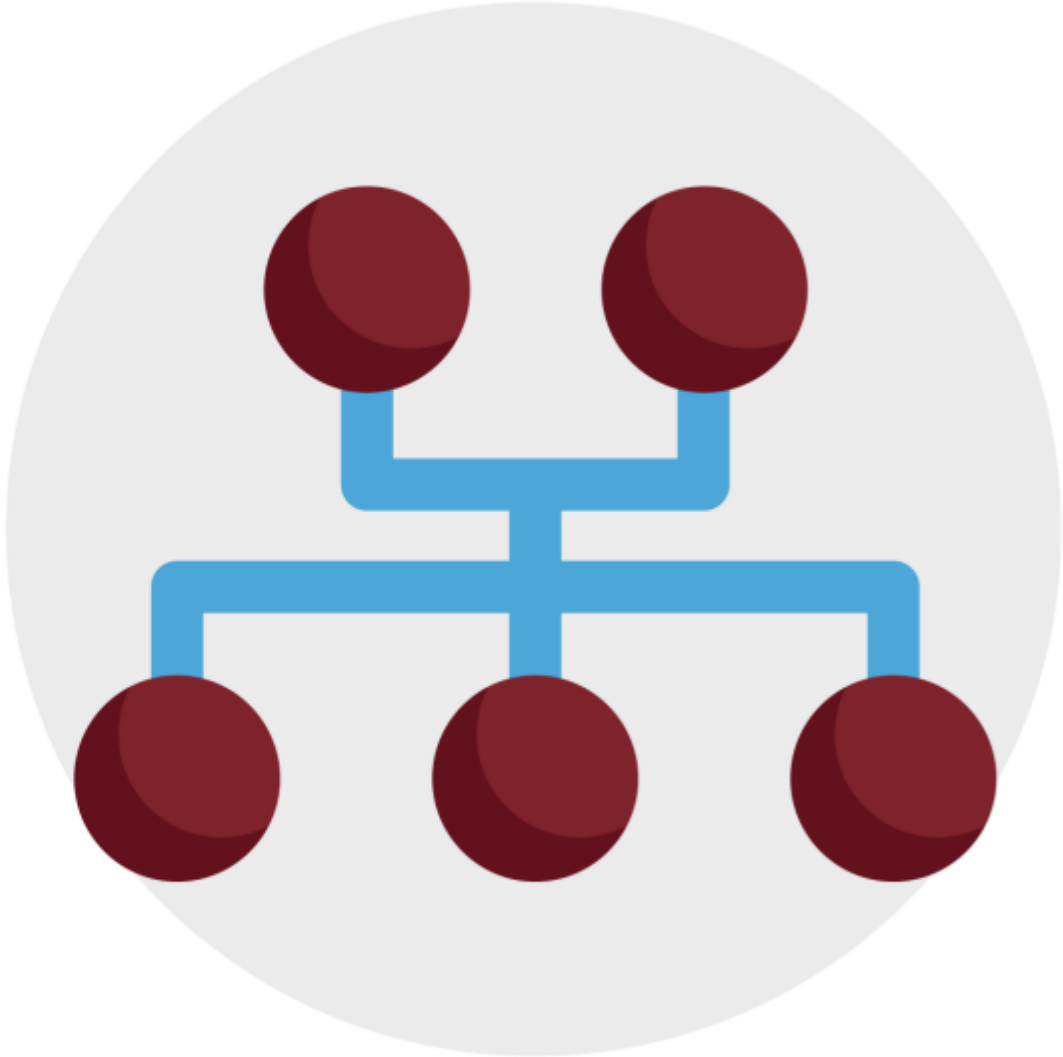


Science

Curriculum Mapping

2023 Onwards



Big Ideas in Science

- Our strands thread throughout the curriculum from KS3 to KS5.
- These strands are the common themes – the key concepts that run through the three disciplines of biology, chemistry and physics.
- We have organised our curriculum as a spiral design that returns to these concepts time and time again as demonstrated by the organisation behind our teaching plans.

Key concepts that thread throughout the science curriculum (KS3-5)

BIOLOGY

Organisms

Cells

Genetic info

Plants

Ecosystems

CHEMISTRY

Physical changes

Atoms, elements

Chemical change

Physical chemistry

PHYSICS

Energy

Waves

Particle model

Circuits

Fields

Forces

Organisms

Living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways

Cells

The fundamental units of living organisms are cells, which may be part of highly adapted structures including tissues, organs and organ systems, enabling living processes to be performed effectively. Organic compounds are used as fuels in cellular respiration to allow the other chemical reactions necessary for life

Genetic info

The characteristics of a living organism are influenced by its genome and its interaction with the environment. Evolution occurs by a process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees

Plants

Life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen

Ecosystems

The chemicals in ecosystems are continually cycling through the natural world. Living organisms are interdependent and show adaptations to their environment

Physical changes

Matter is composed of tiny particles called atoms and there are about 100 different naturally occurring types of atoms called elements
Elements show periodic relationships in their chemical and physical properties

Atoms, elements

These periodic properties can be explained in terms of the atomic structure of the elements
Atoms bond by either transferring electrons from one atom to another or by sharing electrons

Chemical change

There are barriers to reaction so reactions occur at different rates
Chemical reactions take place in only three different ways:

- proton transfer
- electron transfer
- electron sharing

Physical chemistry

Energy is conserved in chemical reactions so can therefore be neither created nor destroyed. The shapes of molecules (groups of atoms bonded together) and the way giant structures are arranged is of great importance in terms of the way they behave

Waves

Energy

That proportionality, for example between weight and mass of an object or between force and extension in a spring, is an important aspect of many models in science

That physical laws and models are expressed in mathematical form.

Particle
model

The use of models, as in the particle model of matter or the wave models of light and of sound

Circuits

That differences, for example between pressures or temperatures or electrical potentials, are the drivers of change

Fields

Forces

The phenomena of 'action at a distance' and the related concept of the field as the key to analysing electrical, magnetic and gravitational effects

The concept of cause and effect in explaining such links as those between force and acceleration, or between changes in atomic nuclei and radioactive emissions

Holy Family Science curriculum CHEMISTRY

	Year 7		Year 8		Year 9		Year 10		Year 11			
	Chem 1	Chem 2	Chem 3	Chem 4	Chem 5	Chem 6	Chem 7	Chem 8	Chem 9	Chem 10		
Physical Changes		7G The particle model										
	7E States and mixtures					Topic 2 States of matter and mixtures	Topic 1 (part 3) Bonding and structure					
Atoms, elements and The periodic table		7H Atoms elements and compounds				Topic 1 (part 1) Key concepts in chemistry Atomic structure						
								Topic 1 (Part 4) Calculations involving masses				
			8F The periodic table				Topic 1 (Part 2) The Periodic Table			Topic 6 Groups in the periodic table		
						9F Reactivity			Topic 4 Extracting metals and equilibria			
Chemical change			7H Atoms elements and compounds		8G Metals and their uses							
	7F Acids and alkalis							Topic 3 Acids	Topic 3 Electrolytic processes * Links to topic 1 part 3			
				8E Combustion								Topic 8 Fuels and Earth Science
						9E Making materials						
					8H Rocks							
Physical chemistry		7H Atoms elements and compounds								Topic 7 Rates and energy changes		

Holy Family Science curriculum PHYSICS

		Year 7		Year 8		Year 9		Year 10 Year 11				
		Phys 1	Phys 2	Phys 3	Phys 4	Phys 5	Phys 6	Phys 7	Phys 8	Phys 9	Phys 10	
Energy	Particle model								Topic 6 Radioactivity (part 1)		Topic 14 The particle model Topic 6 Radioactivity (part 2)	
	Waves			7L Sound					Topic 4 Waves Topic 5 Light and the EM spectrum			
				8J Light								
	Energy	7I Energy	8K Energy transfers						Topic 3 conservation of energy			
	Electricity				7J/9J Current electricity and electromagnetism					Topic 10 Electricity and electrical circuits		
	Fields										Topic 12 Magnetism and the motor effect Topic 13 EM induction	
				8L Earth and space								
Forces		7K Forces				9I Forces and motion	Topic 1 and 2 Forces and motion	Topic 8 Forces doing work Topic 9 Forces and their effects			Topic 15 Forces and Matter	