Year 7 Science

Year 7 Science introduces students to the key ideas that underpin Biology, Chemistry and Physics. Students develop their practical, mathematical and analytical skills through investigations and experiments, while building a strong foundation of scientific knowledge that will support their learning throughout secondary school.

Advent 1: Working Scientifically, Laboratory Skills and Matter

Students begin by learning how scientists work safely and accurately in the laboratory. They develop an understanding of scientific investigations before exploring the particle nature of matter and how substances are made up of atoms and molecules.

Key areas of study:

- Laboratory safety and hazard symbols
- Scientific theories, hypotheses and variables
- Recording, presenting and analysing data
- Accuracy, precision and scientific equipment
- Atomic structure
- Elements, compounds and mixtures
- Molecules and chemical formulae
- Chemical reactions
- Conservation of mass
- States of matter and physical changes

Advent 2: Cells and Chemical Reactions

Students build on their understanding of living organisms by studying the structure and function of cells and how cells work together to form tissues, organs and organ systems. They develop practical microscopy skills and learn how scientists investigate living organisms. Students also explore chemical reactions, learning how atoms are rearranged to form new substances and how energy is transferred during reactions.

Key areas of study:

- Animal and plant cell structures
- Cell organelles and their functions
- Using microscopes and calculating magnification
- Specialised cells
- Organisation of living organisms
- Human organ systems
- Chemical reactions and word equations
- Conservation of mass
- Combustion and fuels
- Gas tests

- Exothermic and endothermic reactions
- Thermal decomposition

Lent 1: Genetics and Energy

Students explore how characteristics are inherited and how the human body reproduces. They learn about DNA, chromosomes and human development, before studying how energy is stored, transferred and used in everyday life.

Key areas of study:

- Sexual reproduction and fertilisation
- DNA, genes and chromosomes
- Male and female reproductive systems
- Foetal development and pregnancy
- Puberty and the menstrual cycle
- Sources of variation between individuals
- Energy stores and energy transfers
- Conservation of energy
- Useful and wasted energy
- Power and efficiency
- Fossil fuels and electricity generation
- Renewable and non-renewable energy resources

Lent 2: Forces

Students investigate how forces affect the movement and behaviour of objects. They learn how scientists explain motion, pressure and the interaction between objects in everyday situations, linking their learning to transport, sport and engineering.

Key areas of study:

- Contact and non-contact forces
- Friction, air resistance and upthrust
- Weight and gravity
- Force diagrams
- Balanced and unbalanced forces
- Resultant forces
- Pressure
- Floating and sinking
- Speed and factors affecting motion

Trinity: Ecology and Properties of Matter

Students explore how organisms interact with each other and their environment, developing an understanding of ecosystems and biodiversity. They also investigate

the properties of substances and learn how scientists separate and identify materials using a range of laboratory techniques.

Key areas of study:

- Food chains and food webs
- Producers, consumers, predators and prey
- Energy transfer through ecosystems
- Pyramids of numbers and biomass
- Biotic and abiotic factors
- Interdependence within ecosystems
- Biodiversity and conservation
- Sampling using quadrats
- Solutions, solutes and solvents
- Solubility and dissolving
- Filtration
- Crystallisation
- Distillation
- Chromatography
- Identifying substances using separation techniques

Year 7 provides the foundations for future study in Biology, Chemistry and Physics, helping students develop both scientific knowledge and the skills needed to think and work like scientists.