

# Hawley Hall High School

## KS4 Science Learning Journey



EXPLORE

YOUR

OPTIONS

KS4 Students will complete an assessment at the end of each topic and a mock exam at the end of Year 10

Exams

### P8 Space physics (triple only)

Solar system; stability of orbital motions; satellites (triple only)  
Red-shift (triple only)

### P7 Magnetism and electromagnetism

Permanent and induced magnetism, magnetic forces and fields  
The motor effect  
Induced potential, transformers and the National Grid (triple only)

### P6 Waves

Waves in air, fluids and solids  
Electromagnetic waves  
Black body radiation (triple only)

### P5 Forces

Forces and their interactions  
Work done and energy transfer  
Forces and elasticity  
Forces and motion  
Momentum  
Moments, levers and gears (triple only)  
Pressure and pressure differences in fluids (triple only)

### C7 Organic chemistry

Carbon compounds as fuels and feedstock  
Reactions of alkenes and alcohols (triple only)  
Synthetic and naturally occurring polymers (triple only)

### C8 Chemical analysis

Purity, formulations and chromatography  
Identification of common gases  
Identification of ions by chemical and spectroscopic means (triple only)

### C9 Chemistry of the atmosphere

The composition and evolution of the Earth's atmosphere  
Carbon dioxide and methane as greenhouse gases  
Common atmospheric pollutants and their sources

### C10 Earth's resources

Using the Earth's resources and obtaining potable water  
Life cycle assessment and recycling  
Using materials (triple only)  
The Haber process and the use of NPK fertilisers (triple only)

### C6 Rates of reaction

Rate of reaction  
Reversible reactions and dynamic equilibrium

### B5 Homeostasis and response

Homeostasis  
The human nervous system  
Hormonal control in humans  
Plant hormones (triple only)

### B6 Inheritance and variation

Reproduction  
Variation and evolution  
The development of understanding of genetics and evolution  
Classification of living organisms

### B7 Ecology

Adaptations, interdependence and competition  
Organisation of an ecosystem  
Biodiversity and effect of human  
Trophic levels in an ecosystem (triple only)  
Food production (triple only)

### C5 Energy changes

Exothermic and endothermic reactions  
Chemical cells and fuel cells (triple only)

### P1 Energy

Energy changes in a system, and the ways energy is stored before and after such changes  
Conservation and dissipation of energy  
National and global energy resources

### P2 Electricity

Current, potential difference and resistance  
Series and parallel circuits  
Domestic uses and safety  
Energy transfers  
Chemical cells and fuel cells (triple only)

### P3 Particle model

Changes of state and the particle model  
Internal energy and energy transfers  
Particle model and pressure

### P4 Atomic structure

Atoms and isotopes  
Atoms and nuclear radiation  
Hazards and uses of radioactive emissions and of background radiation (triple only)  
Nuclear fission and fusion (triple only)

### C4 Chemical changes

Reactivity of metals  
Reactions of acids  
Electrolysis

### C3 Quantitative chemistry

Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations  
Use of amount of substance in relation to masses of pure substances  
Yield and atom economy of chemical reactions (triple only)  
Using concentrations of solutions in mol/dm<sup>3</sup> (triple only)  
Use of amount of substance in relation to volumes of gases (triple only)

### C2 Bonding and properties relating to structure

Chemical bonds, ionic, covalent and metallic  
How bonding and structure are related to the properties of substances  
Structure and bonding of carbon  
Bulk and surface properties of matter including nanoparticles (triple only)

### C1 Atomic structure and the periodic table

A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes  
The periodic table  
Properties of transition metals (triple only)

Year 10 GCSE

### B4 Bioenergetics

Photosynthesis  
Respiration

### B1 Cell biology

Cell structure  
Cell division  
Transport in cells

### B2 Organisation

Principles of organisation  
Animal tissues, organs and organ systems  
Plant tissues, organs and organ systems

### B3 Infection and response

Communicable diseases  
Monoclonal antibodies (triple only)  
Plant diseases (triple only)

Year 11

Mock Exam

