



Science Learning Journey

BTEC Level 3 in Applied Science

How do the uses of chemical substances relate to their physical and chemical properties both in the medical and plastics industry?
 How can diseases related to the respiratory and circulatory systems be diagnosed and treated?
 How can a heat engine be designed for optimal theoretical efficiency?
 How can laboratories be designed to meet health and safety regulations?

A-level Biology

Develop knowledge of:
 Organisms' response to their environment
 Genetics, evolution and ecosystems
 Gene expression



YEAR 13

A-level Chemistry

Develop knowledge of:
 Physical Chemistry (e.g. thermodynamics & rate equations)
 Inorganic chemistry (e.g. transition metals and reaction of ions)
 Organic chemistry



A-level Physics

Develop knowledge of:
 Nuclear physics
 Astrophysics
 Medical physics
 Fields

A-level Physics

An introduction to:
 Material properties and mechanical physics
 Particles, electromagnetic radiation & quantum phenomena
 The properties and applications of travelling and stationary waves
 Electricity



A-level Biology

An introduction to:
 The key molecules in biochemistry
 The key structures of cells?
 How organisms exchange substances with their environment?



Exam & Post - 16 Destination

Go to University

Start a degree level apprenticeship

Take a gap year

YEAR 12

YEAR 11

YEAR 10

YEAR 9

YEAR 8

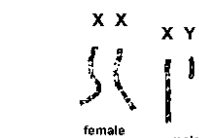
YEAR 7

BTEC Level 3 in Applied Science

How can we make predictions for how chemical substances will react based on atomic structure and the properties of elements?
 What are the structures found within both eukaryotic and prokaryotic cells?
 How can drugs affect the nervous system?
 How does the communication industry and medical science make use of the electromagnetic spectrum?
 What are the essential practical skills required to effectively plan and carry out investigations to obtain reliable results?

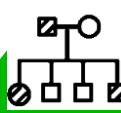
A-level Chemistry

An introduction to:
 Inorganic chemistry (periodic table)
 Organic Chemistry (alkanes, alkenes, alcohols)



Reproduction

What are the types of Reproduction?
 How do we inherit our characteristics?



Genetics and Evolution

What is the theory of evolution?
 What evidence for evolution do we have?
 How do fossils form?
 What is antibiotic resistance?



Energy Changes

What are the different types of reaction?
 How is energy transferred in a reaction?
 What is electrolysis?



Chemical reactions

How do we calculate the rate of a reaction?
 What factors effect the rate of reaction?

Quantitative chemistry

What calculations are essential in Chemistry?
 What is the reactivity series?
 What is an acid and alkali?

Hormonal control

What is the endocrine system?
 What are the hormones of the menstrual cycle?
 How is blood sugar level controlled?



GCSE exams start

May-June

Electromagnetism

How does a transformer work?
 How do motors work?

Biodiversity

What is biodiversity?
 How are humans impacting biodiversity?



Space

What makes up our solar system?
 What is the lifecycle of a star?
 What is the history and future of our universe?



Equilibrium

What is a reversible reaction?
 What is dynamic equilibrium?
 What is Le Chatelier's principle?

Bonding

What is ionic, covalent and metallic bonding?
 What are the properties of the different types of bonding?



Radioactivity

What are the types of radioactivity?
 What are the uses and dangers of radioactivity?
 What is nuclear fission and fusion?

Human nervous system

What is a neuronal pathway?
 What is reflex action?
 What is the structure and function of the brain and eye?



Variation and evolution

What is variation?
 What is genetic engineering?
 What is cloning?
 What are the ethics of genetic technology?



Infection and response

What is a pathogen?
 How does our immune system work?
 What is a non-communicable disease?



Bioenergetics

What is respiration?
 What factors affect photosynthesis?
 How does our body respond to exercise?



Using resources

What are the uses for ceramics and polymers?
 How do we obtain drinking water?
 How do we treat wastewater?



Forces in motion

What is speed?
 How is acceleration and force linked?
 What is momentum and terminal velocity?



YEAR 10

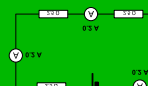
Electricity in the home

How is a plug made?
 How is electricity supplied to the home?



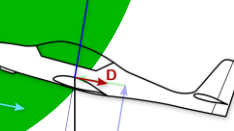
Electricity

What are the properties of circuits?
 How are electrical circuits arranged?



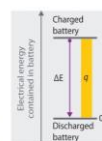
Forces in balance

What are vector and scalar quantities?
 What forces act between objects?
 What is a resultant force?



Energy

How is energy stored and transferred?
 How is heat energy transferred?



Organic Chemistry

What is a hydrocarbon?
 How is crude oil separated?
 How do alkenes and alcohols react?

Chemistry of our atmosphere

What are atmospheric pollutants?
 How did our atmosphere evolve?
 What is global climate change?



Energy resources

What are the types of energy resources?
 How do resources impact the environment?

Organisation

How is our food digested?
 What is our circulatory system?
 How are plan tissues organised?



Atomic structure

What is the history of the atom?
 How do we separate mixtures?
 What is an ion and isotope?

Chemical Analysis

What is a pure substance?
 What is a formulation?
 What is chromatography?
 How do we test for gases?

Waves

What are the types of waves?
 What are the properties of waves?
 How do we use waves in industry?



Molecules and Matter

What is density?
 What are the states of matter?

EM waves

What is the electromagnetic spectrum?
 The uses of different EM radiation

Cell Biology

How are plant, animal and bacterial cells different?
 How do cells divide?



Periodic table

How has the periodic table changed over time?

Electricity and Magnetism

What is charge?
 What is an electromagnet?
 How do we make a circuit?



The Earth

What is our atmosphere?
 What is the rock cycle?
 How is carbon cycled?



Motion and Pressure

What is speed?
 What is pressure?
 What is a turning force?



Healthy living

What makes up our food?
 How do we test food?
 How does lifestyle influence health?
 Digestion

Sound

What is a sound wave?
 How can we detect sound?
 What are echoes and ultrasound



YEAR 8

Atoms and Elements

What is a compound?
 What is a sub-atomic particle?
 How do we write chemical formulae?



Ecosystems

How do plants obtain their energy?
 How do organisms interact in their ecosystems?



Light

What is light made up of?
 How does the eye work?
 How do we see colours?



Reactions

What is a chemical reaction?
 How do we write equations?
 What are the types of reactions?

Adaptations

What is variation?
 What is inheritance?
 What is natural selection?



Energy

What is a fuel?
 How is energy transferred?
 How is energy and power linked?



Acids & Alkalis

What is an acid or alkali?
 How do we measure pH?
 What is neutralisation?



Body systems

What makes up the skeleton? How do our joints work?

Forces

What is Hooke's Law?
 When are forces balanced?



Separation Techniques

What is filtration and crystallisation?
 What is chromatography?
 What is a mixture?

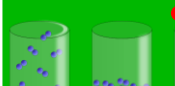
Reproduction

What are the reproductive organs?
 What is fertilisation?
 What is the menstrual cycle?
 How do plants reproduce?



Particles

What are the states of matter?
 What is diffusion?



Cells

What is inside cells?
 How do we observe cells

