Year 10 Chemistry

AUTUMN TERM

Matter

Atomic structure & periodic table

- development/structure of the atom
- periodic table development/numbers
- isotopes

Structure & bonding

- ionic bonding/properties
- covalent bonding/properties
- metallic bonding/ properties
- allotropes of carbon

States of matter

- particle model & limitations
- pure substances
- heating curves

SPRING TERM

Matter

Separating substances

- filtration/crystallisation
- chromatography (Rf values/phases)
- distillation (simple + fractional)
- making potable water

Reactions

Calculations involving masses

- conservation of mass
- the mole and calculations involving these
- uncertainties

SUMMER TERM

Reactions

Energy changes in reactions

- reaction profiles
- breaking and making bonds

Making salts

- acids reactions
- ionic equations
- concentrations
- making a soluble salt
- strong/weak acids
- titrations

YEAR 10 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in KS3 science, including: **comparing** models of the atom, **calculating** RAM, **explaining** formation of ionic bonds, **comparing** bonding, structure and properties of different substances, **planning** a chromatography experiment, **describing** how potable water is formed, **calculating** mass of a substance, **describing** graphs, **evaluating** a method to investigate temperature change.

Year 11 Chemistry

AUTUMN TERM

Reactions

Rates of reactions

- calculating rate
- rate graphs
- collision theory
- rate factors

Matter

Organic chemistry

- Crude oil (*Earth*)
- alkanes
- alkenes
- alcohols
- carboxylic acids & esters
- polymerisation

SPRING TERM

Earth

Earth's atmosphere & resources

- early & current atmosphere
- atmospheric pollution
- greenhouse effect
- sustainable development including LCAs

Reactions

Industrial chemistry

- reversible reactions
- equilibrium
- Haber process
- NPK fertilisers

Energetics

- energy changes in reactions
- cells & batteries

SUMMER TERM

Building confidence through consolidation of skills, development of problem solving and synoptic thinking.

YEAR 11 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in year 10 Chemistry, including: **interpreting** rate of reaction graphs, **planning** an experiment to investigate rate factors, **explaining** fractional distillation of crude oil, **identifying** organic compounds from their functional groups, **comparing** the early and current atmosphere, **evaluating** different materials in a LCA, **predicting** an effect on equilibrium, **drawing** reaction profiles and **calculating** bond energies.

Year 12 Chemistry

AUTUMN TERM

- Atoms, compounds, molecules & equations
- Amount of substance
- Acid-base & redox reactions

- Basic concepts of organic chemistry
- Hydrocarbons

SPRING TERM

- Electrons, bonding & structure
- Periodic table & periodicity
- Group 2 & halogens
- Qualitative analysis

- Alcohols/haloalkanes
- Organic synthesis
- Analytical techniques

SUMMER TERM

- Enthalpy changes
- Reaction rates & equilibrium

- Practical techniques in organic synthesis

YEAR 12 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in the threads of MATTER, REACTIONS and EARTH throughout KS4 chemistry, including: **calculate** empirical and molecular formula, **explain** the benefits of developing chemical processes with high atom economy, **describe** the technique for making standard solutions, **compare** bonds and intermolecular forces, **explain** molecular shapes, **naming** and **drawing** organic molecules, **explaining** trends in boiling points, **comparing** reactivity of haloalkanes, **evaluating** the environmental impact of producing polymers, **describing** equipment involved in organic synthesis.

Year 13 Chemistry

AUTUMN TERM

- Reaction rates and equilibrium
- pH and buffers
- Enthalpy, entropy & free energy

- Aromatic compounds
- Carbonyl compounds
- Carboxylic acids and esters
- Nitrogen compounds

SPRING TERM

- Redox and electrode potentials
- Transition elements

- Polymers
- Organic synthesis
- Chromatography & spectroscopy

SUMMER TERM

Building confidence through consolidation of skills, development of problem solving and synoptic thinking.

YEAR 13 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in year 12 Chemistry, including:

interpreting initial rates data, **describing** rate investigations, **calculating** kp, **explaining** the control of blood pH, **comparing** different models to **explain** acid-base behaviour, **comparing** models of benzene, **evaluating** experimental evidence for theories, **describing** tests for organic functional groups, **predicting** structures from NMR spectroscopy.