

Inspiring the scientists of tomorrow to recognise that, as Rosalind Franklin said, “Science and everyday life cannot and should not be separated”. Science has changed our lives and is vital to the world’s future prosperity, and we believe that all our pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

We aim to develop our students by building upon key foundational knowledge and concepts, encouraging them to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena, enabling them to develop into scientifically literate individuals. This will be done by making sense of the world that we live in through investigation as well as using and applying processing skills and exposing the students to high-quality teaching and learning experiences. Building on our student’s natural curiosity and developing a scientific approach to problems. To ensure that our students are prepared for life in an increasingly scientific and technological world today and in the future.

TLS Chemistry A-level Curriculum

Textile Chemist, Pest Control technician
 Chemist, Chemical Engineer, Forensic Chemist
 University Further Degree
 University Professor
 Pharmacist

Revision and exams

- Catch up on any outstanding areas of the curriculum content
- Revise and prepare for forthcoming exams.

Organic chemistry

- Optical isomerism
- Aldehydes and ketones
- Carboxylic acids and derivatives
- Carboxylic acids and esters
- Aromatic chemistry
- Bonding
- Electrophilic substitution

- Amines
- Preparation
- Base properties
- Nucleophilic properties
- Polymers
- Condensation polymers
- Biodegradability and disposal of polymers

- Amino acids, proteins and DNA
- Enzymes
- Action of anticancer drugs
- Organic synthesis.
- Nuclear magnetic resonance spectroscopy
- Chromatography

Physical chemistry

- Thermodynamics. Born–Haber cycles.
- Gibbs free-energy change, ΔG , and entropy change, ΔS .
- Rate equations. Determination of rate equation.

- Equilibrium constant K_p for homogeneous systems
- Electrode potentials and electrochemical cells
- Electrode potentials and cells
- Commercial applications of electrochemical cells
- Acids and bases

- Brønsted–Lowry acid–base equilibria in aqueous solution
- Definition and determination of pH
- The ionic product of water, K_w
- Weak acids and bases K_a for weak acids
- pH curves, titrations and indicators
- Buffer action.

Inorganic chemistry

- Properties of elements and their oxides
- Transition metals
- Substitution reactions
- Shapes of complex ions
- Formation of coloured ions
- Variable oxidation states
- Catalysts.

Upper VI

Organic chemistry

- Introduction to organic chemistry
- Nomenclature and reaction mechanisms
- Isomerism and Alkanes
- Fractional distillation of crude oil
- Modification of alkanes by cracking
- Combustion and chlorination of alkanes
- Halogenoalkanes
- Nucleophilic substitution
- Structure, bonding and reactivity
- Addition reactions of alkenes
- Alcohols- production, oxidation and elimination of alcohols
- Identification of functional groups by test-tube reactions.

Inorganic chemistry

- Periodicity
- Classification
- Physical properties of Period 3 elements
- Group 2, the alkaline earth metals.
- Group 7(17), the halogens. Trends in properties.
- Uses of chlorine and chlorate(I).

- Effect of concentration and pressure
- Catalysts
- Chemical equilibria
- Oxidation, reduction and redox equations

Lower VI

Physical chemistry

- Atomic structure
- Fundamental particles
- Mass number and isotopes
- Electron configuration
- Amount of substance
- Relative atomic mass and relative molecular mass

- The mole and the Avogadro constant
- The ideal gas equation
- Empirical and molecular formula
- Balanced equations and associated calculations
- Bonding. Ionic bonding
- Nature of covalent and dative covalent bonds

- Metallic bonding
- Bonding and physical properties
- Shapes of simple molecules and ions.
- Bond polarity. Forces between molecules
- Energetics
- Enthalpy change
- Calorimetry

- Applications of Hess's law
- Bond enthalpies
- Kinetics, Collision theory
- Maxwell–Boltzmann distribution
- Effect of temperature on reaction rate.