

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 Curriculum



THE LAMMAS SCHOOL

Academic researcher, biochemistry  
 Chemical engineer, forensics  
 Toxicologist, nanotechnologist  
 A levels: chemistry  
 University

## Examination preparations

Key scientific facts across all three sciences. Scientific facts and theories in a range of contexts. Experimental procedures in a range of contexts.

**Quantitative Chemistry**- Applying math skills to a variety of science contexts and data sets, including relative formula mass. Chemical analysis, and tests to distinguish between chemicals. Law of conservation of mass. Balancing of equations given the masses and products of reactants. Measuring and calculating the concentration of a solution. Limiting reactants. The mole and Avogadro's constant. Calculations of the uncertainty of results.

## Variables

Variables in experimental methods and represent results using a range of graphs. Rates, equilibrium, and organic chemistry. Factors effecting the rate of reaction. Equilibrium and factors effecting equilibrium positions. Variables in a range of chemistry practicals and graphs to represent collected data. Collision theory and catalysts. Dynamic equilibrium.

Gaseous reactions at equilibrium. Effects of changing concentration and pressure on the position of equilibrium. Organic chemistry, earth's atmosphere, and use of resources.

**Year 11**

## Reactions

Reaction of metals with acids to produce salts. Neutralisation reactions. Acids, alkalis and universal indicators. Electrolysis- predicting the products at the electrodes. Reaction of metals with oxygen (oxidation and reduction). Methods of metal extraction. Ionic equations for displacement reactions. Strong and weak acids.

## Energy Changes in Reactions

Endothermic and exothermic reactions. Energy profile diagrams. Bond energy calculations. Activation energy. Bonding-Drawing dot and cross diagrams to represent covalent and ionic compounds. Giant metallic and ionic structures. Simple covalent compounds. Bonding in metals. Properties of ionic compounds. Metal and non-metal reactions.

## Atoms

Define an atom, element, ion and a mixture. The atomic model. Draw electronic structures using periodic table data. Explain the properties of elements according to their position in the periodic table. Noble gases, halogens, alkali metals.

**Year 10**

## Required practical

Design an investigation which includes background research on the related topic, identifying variables and analysing data and concluding results. Students will build fundamental practical skills which will help them to think like a scientist.

## Identifying Unknowns

Using a variety of chemical tests and separation techniques, students will investigate an unknown sample. Students will have the opportunity to learn analytical and practical skills as well as the background on the key concepts. Students will be given the opportunity to extend their learning through offsite trips within or outside the local community.

**Year 9**

## Earth

- Global warming
- Carbon cycle
- Climate change
- Extracting metals
- Recycling

## Reactions

- Combustions
- Conservation of mass
- Energy changes
- Exothermic and endothermic reactions
- Calculating bond energies

**Year 7**

## Becoming a scientist and Chemistry

- Lab safety
- Introduction to practical skills
- Using a Bunsen burner
- States of matter (solid, liquid, and gas)
- Movement of particles
- Separating mixtures

## Reactions

- Chemical reactions
- Acids and alkalis
- Understanding the difference between elements, mixtures, and compounds
- Introduction to the Periodic Table
- Practical – making salts
- Displacement reactions

## Earth and Rocks

- Structure of the layers of the Earth
- The rock cycle
- Phases of the moon
- Solar system

**Year 8**

## Matter

- Arrangement of periodic table
- Explain what is an atom
- Using a particle diagram to classify substances as an element, mixture and compound