

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 Biology Curriculum

Medicine, dentistry, Veterinary science  
 Alevels, Biology  
 Academic researcher, Marine biologist  
 Pharmacologist, nanotechnologist  
 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.  
 Explore DNA and the genome Sexual and asexual reproduction in terms of animals and plants. The use of punnet square to explain inheritance. The different types of reproduction and variation in outcomes.

The competition between animals and plants and the structure of ecosystems .  
 How ethics plays a role in evaluating scientific methods across reproduction. Variables in experimental methods and represent results using a range of graphs.  
 Homeostasis systems:  
 •Blood glucose **homeostasis**.  
 •Core body temperature **homeostasis**.  
 •The volume of body water **homeostasis**.  
 •The use of hormones to regulate the menstrual cycle

Inheritance The definition of a gene as small section of DNA on a chromosome, proteins as a sequence of amino acids, to make a specific protein. Cell division by mitosis and meiosis. The ethics of genetic engineering and cloning.  
 The distinction between inherited and infectious disease. The study of evolution and fossils.

Ecology – The study of habitats, use of quadrats to estimate populations of species and the study of different ecosystems. Biotic and Abiotic factors.

Biodiversity and waste management. Land use and deforestation. Global warming and maintaining biodiversity.

**Year 11**

**Biology** – Reproduction and biological responses The role of neurones and sequence of neurones in reflex and voluntary actions (biology). Compare response times to reflex and voluntary actions (biology).

**Bioenergetics.** The role of chloroplasts in photosynthesis as well as the reactants and products (biology), How factors affect the rate of photosynthesis and respiration. Analysis of graphs of the Limiting factors of photosynthesis.

**Biology –Infectious and non-infectious diseases**  
 How communicable diseases are transmitted E. Evaluate disease prevention techniques . Variables in a range of biology experiments and graphs to represent collected data. Cell organisations, enzymes and digestion. Food tests, lungs and the circulatory system. Health and disease. Transpiration, Active transport and Osmosis.

**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

**Cells Project**  
 Using Microscopy to investigate specialised cells, building on prior knowledge of cells.  
 Compare the evaluate the best type of microscope.  
 How microscopic technology has impacted science advancement including in the medical industry. Students will be given the opportunity to extend their learning on off site trips within or outside of the local community.

**Year 9**

**Genes**

- Genetics
- Evolution
- Extinction
- Interpretation graphs
- DNA and inheritance
- Genetic modification and food

**Ecosystems**

- Practical Investigating Photosynthesis
- Respiration
- Biotechnology
- Photosynthesis
- Practical investigating starch in leaves

**Year 7**

**Becoming a scientist and Biology**

- Lab safety
- Introduction to practical skills
- How to use a microscope
- Understanding cells are building blocks of life
- Structure and function of the human skeletal and muscle system

**Ecosystems**

- Understanding how an ecosystem works
- Food chains and webs
- Competition between living organisms
- Fertilisation and pollination in plants

**Year 8**

**Genes**

- Variation between organisms
- Causes of variation
- Human reproductive system

**Organisms**

- Breathing gas exchange
- Drugs, smoking and alcohol
- Nutrition
- Digestive system