

# Biology

The Biology curriculum encourages curiosity about biological organisms and the natural world. We support students to further their knowledge and understanding of the world around them. Students can develop the skills to solve problems and make informed decisions in scientific contexts, and are encouraged to advance their skills in scientific inquiry. Students will plan and carry out practical tasks using a variety of different apparatus and draw relevant conclusions, presenting scientific ideas, arguments and practical experiences accurately in a variety of ways. We encourage analytical, critical, and creative thinking to solve problems, judge arguments and make decisions in scientific and other contexts.

## KS3

By the end of KS3 students will be able to build on their Year 6 knowledge by using microscopes to investigate cells, assessing risks, and recording results accurately. They will develop understanding of cells, bioenergetics, ecology, metabolic reactions, and maintaining a healthy body, while strengthening practical and mathematical skills such as calculating magnification and percentage change. Students will also study the digestive and respiratory systems, and learn how diseases can be prevented or controlled through barriers, reduced contact, and the immune system.

## KS4

By the end of KS4 students will be able to explain the structure and function of the nervous and hormonal systems, building on earlier knowledge of cells and reproduction. They will deepen their understanding of genetics through inheritance and genetic disorders, and apply their learning to ecosystems, developing a secure grasp of interdependence and the processes that sustain human life.

## KS5

By the end of KS5 students will be able to explain how biological molecules, cells, and genetics underpin life, using practical and analytical skills to investigate and evaluate scientific ideas. They will compare cell types, explore inheritance, and study how organisms interact with their environments through ecology and energy transfer. Students will also understand how organisms adapt and respond via neural, hormonal, and feedback mechanisms, equipping them for further study and to engage critically with contemporary scientific issues.



Topics with the WR logo are directly linked to the Hoe Valley School Work Ready Agenda.

Evolution & Populations, Genome Projects & Gene Technology

A-Level Exams

### YEAR 13

Inheritance & Populations, Control of Gene Expression

Energy & Ecosystems, Nutrient Cycles, Homeostasis

Photosynthesis & Respiration, Response & The Nervous System

### YEAR 12

Mass Transport, Genetic Diversity, Species & Taxonomy

Biodiversity, Investigation into Biodiversity, Mass Transport in Plants



Transport Systems & Sampling

Gas Exchange, Digestion & Absorption, Mass Transport, DNA, Genes & Chromosomes, Protein Synthesis

Biological Molecules, Nucleic Acids, Water, Cell Structure, Cell Division, Transport Across Membranes, The Immune System

Biological Molecules & Cell Structure

Waste Management, Land Use, Global Warming, Food Production

GCSE Exams

### YEAR 11

Ecology, Impact of Environmental Change

Evolution, Interdependence, Adaptations, Levels of Organisation, Material Cycling & Decomposition

Endocrine System

Genes & Inheritance, DNA & The Genome, Inherited Disorders, Inheritance of Sex, Variation & Evolution

Natural Selection, Antibiotic Resistance, Extinction, Classification

### YEAR 10

The Endocrine System, Maintaining Blood Glucose, Maintaining Nitrogen & Water Balance, Reproductive Hormones, Plant Hormones

The Nervous System, The Brain, The Eyes, Control of Body Temperature, Maths in Science

Photosynthesis & Rates, Transpiration, Uses of Glucose, Aerobic & Anaerobic Respiration, Response to Exercise & Metabolism

Plant Tissues & Organs, The Leaf, Xylem & Phloem, Leaf Adaptations



Communicable Disease, Pathogens, Human Defences, The Immune System, Vaccination, Drug Development

Plant Diseases, Plant Pathogens, The Effects of Plant Pathogens

### YEAR 9

Organisation, Cells, Tissues & Organs, Digestive System, Circulatory System, Enzymes

Cell Structure, Magnification, Eukaryotic & Prokaryotic Cells, Specialised Cells, Transport in Cells

Cells

### YEAR 8

Rates of Respiration Investigation, Anaerobic Respiration

Nutrition, Food Groups



Food Tests, A Balanced Diet, Energy in Food

Respiration Definition, Reactants & Products of Respiration

Gas Exchange in the Leaf, Rates of Transpiration, Specialised Plant Cells

Photosynthesis, Structure of Leaves

Structure of a Flower, Ecosystems

Interpreting Food Chains & Webs, Interpreting Pyramids of Numbers & Biomass



Investigation into diversity and conservation

### YEAR 7

Reproductive Cells & Systems

Studying Cells

Cell Structure



Investigative Skills



Data Analysis



Safety



Maths in Science