

# ACE Science Curriculum Map 2023/2024

## Curriculum Overview

Our Science curriculum covers a broad range knowledge and methodology within Biology, Chemistry and Physics at KS3. KS4 students follow the AQA GCSE Biology programme of study. This allows students to understand the principles and rationale in Science and make links between the disciplines.

This knowledge then enables them to make predictions, draw conclusions and understand how the world around them works. This further enables them to question the uses and implications of Science and make informed contributions to the society they live in a time where Science and Technology is increasingly significant.

Working scientifically underpins how Science is taught and inspires a curiosity and enjoyment of the subject. Opportunities are planned in for students to plan and implement investigations, analyse and present data and make conclusions. Communicating these skills is consistent between each discipline of Science.

Students at ACE follow a part time timetable with KS3 receiving 2x 45 minute lessons per week and KS4 receiving 3 x 45 minute lessons per week.

Due to this part-time timetable, course content and knowledge has been prioritised across both key stages to ensure learning is progressive and substantive meeting the needs of our pupils.

Our schemes of work are reviewed regularly to ensure they remain challenging and enable our students to reach their full potential. The complex language of Science is considered in every topic and any learning gaps addressed with adaptive teaching where possible.

## KS3 Science (Based on AQA's big ideas)

Term	1	2	3
KS3 Year 7/8	Cells	Particle Model	Magnetism
	Earth	Photosynthesis	Movement
		Acids and Alkalis	Metals and Non-Metals
	Assessment 1	Assessment 2	Assessment 3
Year 9	Interdependence	Respiration	Variation
	The Periodic Table	Chemical Energy	Human Reproduction
	Electromagnetism	Wave Properties	Matter
	Assessment 1	Assessment 2	Assessment 3

## KS4 Overview

Term	1	2	3
Year 10	Cell Biology 1A	Organisation 2A	Infection and Response 3A
	Assessment 1A	Assessment 2A	Assessment 3A
	Cell Biology 1B	Organisation 2B Organisation 2C	Bioenergetics 4A
	Assessment 1B	Assessment 2B/C	Assessment 4A
Year 11	Homeostasis and Response 5A	Inheritance , Variation and Evolution DNA and Reproduction 6A	Ecology
	Assessment 5A	Assessment 6A	Assessment 7A
	Endocrine System 5B Animal and Plant Hormones 5C	Inheritance , Variation and Evolution Genetics 6B	Ecology Human impact on the environment 7B  Ecology Human impact on the environment 7C
	Assessment 5B/5C	Assessment 6B	Assessment 7B/7C

## **KS4 GCSE Biology**

**Year 10**

<b>Topic 1 – Cell Biology 1A Term 1</b>
<b>Cells and Cell Structure</b>
<b>Microscopy</b>
<b>Cell division and Specialisation</b>
<b>Chromosomes and DNA Structure</b>
<b>Mitosis</b>
<b>Binary Fission</b>
<b>Culturing Microorganisms (REQUIRED PRAC)</b>
<b>Stem Cells</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 1 – Cell Biology 1B Term 1</b>
<b>Diffusion</b>
<b>Osmosis - (Required Practical)</b>
<b>Active Transport</b>
<b>Exchange Surfaces</b>
<b>Exchanging Substances</b>
<b>End of topic assessment - Example style questions</b>

<b>Topic 2 – Organisation 2A Term 2</b>
<b>Cell Organisation</b>
<b>The Lungs</b>
<b>Circulatory System- The Heart</b>
<b>Circulatory System- The Blood Vessels</b>
<b>Circulatory System – The Blood</b>
<b>Plant Cell Organisation</b>
<b>Transpiration and Transpiration</b>
<b>Transpiration and Stomata</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 2 – Organisation 2B/C Term 2</b>
<b>Introduction to Health and Disease</b>
<b>Cardiovascular Disease</b>
<b>Risks for Non-Communicable Diseases</b>
<b>Cancer</b>
<b>Enzymes</b>
<b>Investigating Enzymatic Reactions ( Required Practical)</b>
<b>Enzymes and Digestion</b>
<b>Food tests</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 3 – Infection and Response Term 3</b>
<b>Communicable diseases</b>
<b>Viral diseases</b>
<b>Fungal and Protist Diseases</b>
<b>Bacterial Diseases and preventing disease</b>
<b>Fighting disease</b>
<b>Fighting disease- Vaccination</b>
<b>Fighting disease- Drugs</b>
<b>Monoclonal Antibodies</b>
<b>Monoclonal Antibody uses</b>
<b>Plant Diseases and Defences</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 4 – Bioenergetics Term 3</b>
<b>The basics of Photosynthesis</b>
<b>How plants use Glucose</b>
<b>The Rate of Photosynthesis</b>
<b>Investigating Photosynthesis Rate</b>
<b>The Inverse Square Law</b>
<b>Artificially Controlling Plant Growth</b>
<b>Aerobic Respiration</b>
<b>Anaerobic Respiration</b>
<b>Exercise</b>
<b>Metabolism</b>
<b>End of topic assessment – Exam style questions.</b>

## Year 11

<b>Topic 5- Homeostasis and Response Term 1</b>
<b>Homeostasis</b>
<b>The Nervous System</b>
<b>Synapse and Reflexes</b>
<b>Investigating reaction time (REQUIRED PRAC)</b>
<b>The Brain</b>
<b>The Eye</b>
<b>Correcting Vision Defects</b>
<b>Controlling body Temperature</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 5b –The Endocrine System Term 1</b>
<b>Hormones</b>
<b>Controlling blood glucose</b>
<b>Controlling Water Content</b>
<b>Kidney Failure</b>
<b>Topic 5C-Animal and Plant Hormones</b>
<b>Puberty and the Menstrual Cycle</b>
<b>Contraceptives</b>
<b>Increasing fertility</b>
<b>Thyroxine and Adrenaline</b>
<b>Plant Hormones</b>
<b>Uses of Plant Hormones</b>
<b>End of topic assessment - Example style questions</b>

<b>Topic 6 – Inheritance , Variation and Evolution</b>
<b>DNA and Reproduction Term 2</b>
<b>DNA</b>
<b>Structure of DNA</b>
<b>Protein Synthesis</b>
<b>Mutations</b>
<b>Meiosis</b>
<b>More on Reproduction</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 6 b– Inheritance , Variation and Evolution Genetics Term 2</b>
<b>X and Y chromosomes</b>
<b>Alleles and Genetic Diagrams</b>
<b>Inherited Disorders</b>
<b>The work of Mendel</b>
<b>Variation</b>
<b>Evolution and extinction</b>
<b>Ideas about evolution</b>
<b>Selective breeding</b>
<b>Genetic engineering</b>
<b>Cloning</b>
<b>Fossils</b>
<b>Speciation</b>
<b>Antibiotic Resistant Bacteria</b>
<b>Classification and the Binomial System</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 7 – Ecology Term 3</b>
<b>Organisms and their Environment</b>
<b>Competition</b>
<b>Abiotic and Biotic Factors</b>
<b>Adaptations</b>
<b>Food chains</b>
<b>Using quadrats and Transects (Required prac)</b>
<b>Environmental Change</b>
<b>The Cycling of Materials</b>
<b>Decay</b>
<b>End of topic assessment – Exam style questions.</b>

<b>Topic 7B – Ecology</b>
<b>Human impact on the environment Term 3</b>
<b>Biodiversity and waste</b>
<b>Global warming</b>
<b>Deforestation and land use</b>
<b>Maintaining Ecosystems and Biodiversity</b>
<b>Topic 7C Ecology -Biomass, Food and Biotechnology</b>
<b>Trophic levels</b>
<b>Pyramids of Biomass</b>
<b>Biomass Transfer</b>
<b>Food security</b>
<b>Biotechnology</b>
<b>End of topic assessment – Exam style questions.</b>