ACE Science Curriculum Map 2024/2025

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 3/4 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 were possible.

KS3 Science (Based on AQA's big ideas)

Term	1	2	3
KS3 Year 7/8	Cells	Magnetism /Electromagnetism	Electrical Circuits
	Particle Model	Interdependence	Digestion
	Light	Separating Mixtures	Structure of the Earth
	Assessment 1	Assessment 2	Assessment 3
Year 9	Genes	Respiration	The Nervous System
	The Periodic Table	Elements mixtures and compounds	Human Reproduction
	National and Global Energy Resources	Voltage and Resistance	Types of reactions
	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	Bioenergetics Carried over from 23.24 plans 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

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

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

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

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

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

Year 11 – Carried over from 23/24

Topic 4 – Bioenergetics Term 1 (Carried over from 23.24)
The basics of Photosynthesis
How plants use Glucose
The Rate of Photosynthesis
Investigating Photosynthesis Rate (Required Practical)
The Inverse Square Law
Artificially Controlling Plant Growth
Aerobic Respiration
Anaerobic Respiration
Exercise
Metabolism
End of topic assessment – Exam style questions.

Year 11

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

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

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

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

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

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