Herschel Grammar School
Curriculum Overview 2025/26

Curriculum Intent

From KS3 through to KS5 students need to develop scientific knowledge, enquiry, investigative and analytical skills. At KS3 our students work on key biological concepts, understanding how to use equipment correctly to measure and report findings and develop the literacy skills needed to support in further key stages. At KS4 these skills are developed further so students are able to develop and implement their own scientific investigations in addition to analysing and applying knowledge. Finally, at KS5 our students should be able to design investigations, implement, adapt, analyse and evaluate information as well as transferring information to unfamiliar contexts.
Students are encouraged to be ambitious and ask questions that challenge themselves and their peers.

Curriculum Impact

Regular assessments allow us to monitor the progress students make over a period of time and identify those that need intervention and support. Learning conversations occur on a regular basis and feedback is taken into consideration when developing the curriculum. A high number of students choose to continue onto A level biology at the end of KS4.

Through education, we have the privilege of engaging directly with children and young people who:

- are passionate about the natural world
- want to do their best to protect it
- can influence their wider communities

Throughout this document, whenever the following icon is used 🌍, it indicates that the teaching and learning is linked to one or more of the following:

- nature
- the causes and impacts of climate change
- careers in the green economy
- the importance of sustainability

Biology Curriculum Overview 2025/26

Year Group Plans

Year group	9 Biology

Rationale for sequencing	This follows the National Curriculum but is modified to ensure that key ideas from Key Stage 3 are either returned to or introduced within the GCSE content. Topics follow a logical order that provides a pathway starting with B1 which provides students with a good understanding of key principles that are throughout the entire GCSE.

Term 1	
Half term	**Half term**
B1 - Cell structure and transport • Microscope • Animal and plant cells • Required practical: Looking at cells • Eukaryotic and Prokaryotic cells • Specialisation in animal and plant cells **Task to test understanding of current work to inform early reports**	B1 - Cell structure and transport continued • Osmosis • Required practical: Osmosis • Active transport • Exchange surfaces and adaptations **B1 assessment at end of term.**
Term 2	
Half term	**Half term**
B3 - Organisation and the digestive system • Tissues and organs • Digestive system • The chemistry of food • Required Practical: food tests • Catalysts and enzymes	• Factors affecting enzyme action • Required practical Enzymes • How the digestive system works • Making digestion efficient **Assessment on B1 and B3**

Biology Curriculum Overview 2025/26

Term 3	
Half term	**Half Term**
B4 - Organising animals and plants • Blood • Blood vessels • Heart	• Helping the heart • Breathing and gas exchange **Assessment before half term on B3 and B4** B18 1.5 – Biodiversity and ecosystems  As much as possible delivered in lessons, some to be done over the summer to develop independent study skills. • Human population explosion • Pollution • Deforestation • Global warming

Key Assessment Plans:	
Term 1	B1 Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self-assessed.
Term 2	Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self-assessed. Larger B1 and B3 assessment
Term 3	Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self-assessed. Assessment on B3 and B4

Biology Curriculum Overview 2025/26

Year group	**10**

Rationale for sequencing	Pupils start with a review to ecology work set at the end of year 9. They continue to learn human biology and disease using knowledge from year 9 as a foundation. All plant biology has been taken from individual chapters and are studied together in year 10 so students are more able to make links and understand how processes can work with or against each other. Students will finish paper 1 and then start to learn more complex concepts at the end of year 10.

Term 1	
Half term	**Half term**
First two lessons back reviewing the following  *Human population* *Pollution* *Deforestation* *Global warming* B5 - Communicable diseases • Health and disease • Pathogens and disease • Growing bacteria in the lab • Preventing bacterial growth • Required practical: Antiseptics and antibiotics • Preventing infections • Viral diseases • Bacterial diseases • Diseases caused by fungi and protists DO NOT COVER PLANT DISEASES HERE B7 - Non-communicable diseases Set as study work over break and looked at upon their return • Non-communicable diseases • Cancer • Smoking • Diet • Alcohol	Spend x2 lessons reviewing B7 work. B5 CONTINUED • Human defence responses B6 - Preventing and treating diseases: • Vaccination • Antibiotics and painkillers • Discovering drugs • Developing drugs • Making monoclonal antibodies • Uses of monoclonal antibodies B9 - Respiration • Aerobic respiration • The response to exercise • Anaerobic respiration • Metabolism and the liver

Biology Curriculum Overview 2025/26

Assessment before half term on B18, B4 and B5 (only on the B5 content covered this half term)	
Term 2	
Half term	**Half term**
B4 – Plant transport • Tissues and organs in plant • Transport systems in plants • Evaporation and transpiration • Factors affecting transpiration **Assessment on B6, B7and B9** B8 - Photosynthesis • Photosynthesis include a review of adaptation, competition and transpiration. • Rate of photosynthesis • Required practical: Photosynthesis • How plants use glucose • Making the most of photosynthesis B5 – Plant diseases – set over half term if needed • Plant diseases – black rose spot, TMV, mineral deficiency diseases • Plant defence responses	B16 – Adaptations, interdependence and competition • The importance of communities • Organisms and their environment • Distribution and abundance • Competition in animals • Competition in plants • Adaptations in animals and plants • Required Practical: Quadrats B17 - Organising an ecosystem • Feeding relationships • Materials cycling • The carbon cycle • Rates of decomposition • Required practical: Decay
Term 3	
Half term	**Half Term**
Year 10 exam B10 – Nervous System • Principles of homeostasis • Nervous system • Reflex actions Required practical: Reaction times • The brain • The eye	B11 - Hormonal coordination • Principles of hormonal control • Controlling blood glucose • Diabetes • Negative feedback **Assessment on B10, B11, B16 and B17** B18 18.6 onwards Biodiversity and ecosystems.

Biology Curriculum Overview 2025/26

• Common problems of the eye.	• Biodiversity  • Trophic levels • Biomass • Food security  • Sustainable food production  Any topics not finished to be studied over summer

Key Assessment Plans:	
Term 1	Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self-assessed Assessment on B1, B4 and B5
Term 2	Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self-assessed Assessment on B6, 7 and 9
Term 3	Year 10 exam Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self-assessed Assessment on B10, B11, B16 and B17

Biology Curriculum Overview 2025/26

Year group	**11**

Rationale for sequencing	We start with human biology to link into previous topics taught in year 10. B13-15 are taught in term 2 to keep the interlinked topics close together in teaching time with many links made across lessons.

Term 1	
Half term	**Half term**
Ensure review time happens on chapter 18 work that was set over summer if not finished last term. B11 - Hormonal coordination • Principles of hormonal control • Controlling blood glucose • Diabetes • Negative feedback • Human reproduction • Menstrual cycle • Fertility control • Infertility treatments • Plant hormones and responses • Using plant hormones Required practical: Effect of light on newly germinated seedlings **Low stakes assessment**	B12 - Homeostasis in action • Controlling body temperature • Removing waste products • Kidney • Dialysis • Kidney transplants Start Genetics and reproduction if time permits **Mock exams – topics tbc.**
Term 2	
Half term	**Half term**
B13 and B2 - Genetics and reproduction Includes **Chap 2 work** • Types of reproduction • Cell division • Asexual and sexual reproduction • DNA and the genome • DNA structure and protein synthesis • Gene expression and mutation • Inheritance • Inherited disorders B 14 Variation and evolution • Variation • Evolution by natural selection • Selective breeding	B15 Genetics and Evolution • History of genetics • Theories of evolution • Accepting Darwin's ideas • Evolution and speciation • Evidence of evolution • Fossils and extinction • Classification REVISION UNTIL STUDY LEAVE **Paper 2 mock to be done**

• Genetic engineering	
Term 3	
Half term	**Half Term**
REVISION UNTIL STUDY LEAVE	

Key Assessment Plans:	
Term 1	Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self assessed Mock exam
Term 2	Low stakes testing throughout the term. MCQ quizzes Mini topic tests – peer and self assessed Paper 2 exam
Term 3	SL

Biology Curriculum Overview 2025/26

Year group	**12**

Rationale for sequencing	At the start of the year both teachers deliver a practical skills-based introduction to A level Biology. This will enable students to better utilise learning opportunities in practical work that takes place alongside relevant theory. Modules are split between two teachers. Modules are taught in order to cover the more basic concepts of Biology before applying them to different topics in later terms. Lessons regularly refer back to prior knowledge and understanding to ensure that students can see how content is linked and builds from fundamental principles into one large understanding of biological concepts.

Term 1	
Half term	**Half term**
Bridging work presentations to be seen and feedback given. Can be split between teaching team for each class. Teacher 1 Cell structure • Microscopes • Biological drawing PAG skill • Magnification calculations and calibration of graticule • Ultrastructure of eukaryotic cells • Prokaryotic vs Eukaryotic cells Low stakes in class assessment on cell structure Biological Membranes • Structure of membranes • Diffusion • Osmosis • Active transport • Factors affecting structure and permeability Low stakes in class assessment on membranes PAG skills – tables, graphs and basic maths skills. **Either teacher can deliver but must be done before the first PAGS are taught** PAG 8 Water potential and potato PAG 5 colorimeter investigating membrane permeability Teacher 2 Biological Molecules	Common assessment done on all content so far Teacher 1 Nucleic acids • DNA • DNA replication • Translation & transcription • PAG 10.1 Investigating DNA structure using RasMol Cell Division, diversity and differentiation • Cell cycle • Mitosis • Meiosis • Diversity in animal and plant cells • Animal and plant tissues and organs • Stems cells Low stakes in class assessment on DNA and cell division Teacher 2 Biological Molecules Continued • Colorimeter including glucose testing. Could be used as PAG evidence • Chromatography • PAG 6.1 Identification of Amino Acids in a protein using paper chromatography Enzymes

Biology Curriculum Overview 2025/26

• Bonding • Water • Carbohydrates • Lipids • Proteins • Food testing PAG 9.1, 9.2 & 9.3 Qualitative testing for Biological molecules: Proteins, lipids and Glucose. Low stakes in class assessment on biomolecules	• Biological catalysts • Cofactors • Enzyme action • Effect of temperature, PH and substrate/enzyme concentration on enzyme activity • Enzyme inhibitors • Drugs PAG 4.3 Investigating the effect of pH on lipase activity Common MCQ assessment on all content done before the end of term.
Term 2	
Half term	**Half term**
Common assessment done end of Jan. Teacher 1 Exchange surfaces and Breathing • Exchange surfaces • Mammalian gaseous exchange system • Tissues in the lungs • Measuring lung volumes • Exchange in other organisms PAG 1 Using a Light microscope to study Lung tissue Transport in animals • Circulatory systems • Blood vessels and blood cells (include looking at haemocytometer. Not on spec but can be applied questions) • Tissue fluid • Heart structure and cardiac cycle PAG 2 Dissecting a heart Teacher 2 Communicable disease • Organisms that cause disease • Transmission of pathogens • Plant defences • Primary defences • Phagocytosis • Specific immune response • Antibodies • Vaccination	Teacher 1 • Cardiac cycle and it's coordination • Transport of oxygen and carbon dioxide Classification and evolution • Biological classification • Features and evidence in classification • Phylogeny • Natural selection • Variation and adaptation • Statistics (can be delivered by teacher 2 if time an issue) Teacher 2 Transport in plants • Xylem and Phloem • Movement of water through a plant • Transpiration • Factors affecting transpiration • Adaptations of plants • Translocation Biodiversity *Build in review of biodiversity self study work from half term* • Biodiversity • Sampling plants • Sampling animals • Calculating biodiversity PAG 3.1 Calculation of species Diversity

• Development and use of drugs Independent study work to be set over half term on 4.2.5 -4.2.9: Maintaining biodiversity	Common assessment done mid way through half term. Topics tbc.

Term 3	
Half term	**Half Term**
Teacher 1 PAG 11.1 Investigation into effect of exercise onto pulse rate Communication and homeostasis • Need for communication systems • Homeostasis • Temperature control in ectotherms and endotherm • Excretion • Liver Structure • Liver function Teacher 2 Kidney • Kidney structure • Kidney function • Kidney failure Ecosystems • Nitrogen cycle • Succession • Ecosystems and biomass	Both teachers ensure content from last half term is finished before year 12 exams. Between both teachers finish populations, ecosystems, conservation and preservation. Anything not finished can be completed over the summer. **Year 12 exams**

Key Assessment Plans:	
Term 1	Weekly/biweekly low stakes quick recall questions. Regular exam questions to be used in lesson and peer/self-assessed. Low stakes assessment Skills based questions to be given – tables, graphs and drawing. Common assessment in second half term.
Term 2	Weekly/biweekly low stakes quick recall questions. Regular exam questions to be used in lesson and peer/self-assessed. Low stakes assessment Skills based questions to be given – tables, graphs and drawing. Common assessment.

Biology Curriculum Overview 2025/26

Term 3	Year 12 exams Weekly/biweekly low stakes quick recall questions. Regular exam questions to be used in lesson and peer/self-assessed. Low stakes assessment Skills based questions to be given – tables, graphs and drawing.

Biology Curriculum Overview 2025/26

Year group	**13**

Rationale for sequencing	As with Y12, modules are split between two teachers. Practical work is placed to happen alongside the relevant theory as well as focusing on ISA style work to continue to develop student's analysis and evaluation skills. Lessons regularly refer back to prior knowledge and understanding to ensure that students can see how content is linked and builds from Y12 to one large understanding of biological concepts. This sequence aims to complete all topics by the end of the second term so that the final paper 3 for mocks can be sat before study leave and all contact will be examined.

Term 1	
Half term	**Half term**
Teacher 1 Respiration • Need for cellular respiration • Glycolysis • Links reaction and krebs cycle • Chemiosmosis and oxidative phosphorylation • Anaerobic respiration • Respirometer • Respiratory substrates • PAG 12 – Research skills (respiration in yeast) Photosynthesis • Compensation points • Structure of chloroplasts • Chlorophyll and absorption spectrum Teacher 2 Neuronal Communication • Sensory receptors • Structure and function of neurones • Action potentials • Transmission • Synapses 1 and 2 • Mammalian nervous system • Brain • Reflexes • Coordinating responses • Controlling heart rate • Muscles • Contraction of muscles	**Assessment mid-Nov** Teacher 1 Photosynthesis • ISA style practical (alternative PAG 6) Qualitative Chromatography of photosynthetic pigments • Light dependent reactions • Light independent reactions • Factors affecting photosynthesis • ISA practice: DCPIP (Quantitative and Evaluation) Cellular Control • Gene mutations • Regulation of gene expression • Genetic control of body plan development Teacher 2 Hormonal communication • Endocrine communication • Adrenal glands • Pancreas • Regulating blood glucose • Diabetes Plant responses • Plant responses • Plant hormones • Tropisms • Commercial use of plant hormones

Biology Curriculum Overview 2025/26

Term 2	
Half term	**Half term**
Teacher 1 Patterns of Inheritance • Genetic variation • Monogenic inheritance • Dihybrid inheritance • Multiple alleles • Sex linkage • Co-Dominance • Autosomal linkage • Epistasis • Using the Chi-squared Test • Discontinuous and Continuous variation Teacher 2 Cloning and Biotechnology • Natural Clones • Clones in plants • Artificial clones in animals • Introduction to biotechnology • Using biotechnology to make food • Population growth in closed culture • Aseptic techniques • PAG 7.1 Calculation of bacterial density using serial dilutions • Immobilised enzymes • ISA Quantitative and evaluation: Enzymes and Biotechnology – The Effect of Temperature on the Activity of a Commercial Lipase Continue with term 2 topics if finish early.	Teacher 1 Patterns of inheritance • Factors affecting the evolution of a species • The Hardy – Weinberg principle • Isolating Mechanisms • Artificial Selection Practice Qualitatives: • Observing tissues in mammalian kidney • Enzymes and Biotechnology – The Activity of Immobilised Invertase • Mock body fluids • The distribution of stomata in leaves Practice Quantitatives and Evaluations: • The Effect of a Named Environmental Factor on the Abundance of a Named Plant Species • The Effect of Sodium Chloride Concentration on the Activity of Yeast Cells Teacher 2 Manipulating genomes • PCR • Electrophoresis • Gel Electrophoresis practical • DNA sequencing • Applications of gene sequencing • DNA profiling • Genetic engineering • Issues relating to genetic manipulation • Gene therapy
Term 3	
Half term	**Half Term**
SL	

Biology Curriculum Overview 2025/26

Key Assessment Plans:	
Term 1	Weekly/biweekly low stakes quick recall questions. Regular exam questions to be used in lesson and peer/self-assessed. Optional afterschool exam upon return to school for students looking to improve over summer holiday Assessment mid November
Term 2	Weekly/biweekly low stakes quick recall questions. Regular exam questions to be used in lesson and peer/self assessed. Paper 1: Biological molecules – Modules 1,2 3 and 5 (content not studied yet will be removed) Paper 2: Biological diversity – Modules 1,2, 4 and 6 (content not studied yet will be removed) Paper 3 -Unified biology – Modules 1-6
Term 3	Continued assessment based on areas of improvement identified from mock exams