Beths Grammar School KS5 Biology Curriculum Map – Year 12 (teacher split)

Each class has two specialist teachers, shown side by side (3 lessons a fortnight each), plus a shared consolidation lesson. Module 1 practical skills are developed through the PAGs all year.

Key: **Green shading** = sustainability in context (Summer 3B) **Big question** = a conversation starter for home **Key maths skills (M)** and **How Science Works (HSW)** = OCR skill codes.

Term A Level OCR Biology A (H420)	INTENT	IMPLEMENTATION		IMPACT
	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	**Disciplinary Knowledge (Skills)** **Teacher A** Module 2 (cells, division, membranes) and Module 4	**Disciplinary Knowledge (Skills)** **Teacher B** Module 2 (molecules, nucleic acids, enzymes) and Module 3	**Assessment opportunities** What assessments will be used to measure student progress?
Autumn Term 1A Year 12	**Intent** Why is this taught now? *The course starts with the foundations every later module relies on: how cells are built and viewed (Teacher A) and the molecules they are made from (Teacher B). Microscopy and drawing skills are secured early because they are needed for many of the practicals.* **Teacher A: 2.1.1 Cell structure; 2.1.6 Cell division (begins)** **Teacher B: 2.1.2 Biological molecules** **Big question:** *What are cells made of, and how do we study them?* From GCSE, learners know the main organelles and how to use a light microscope. They now study cell ultrastructure using electron micrographs, calibrate a microscope and calculate magnification. Alongside this, they learn how the structures of water,	**2.1.1 Cell structure** 2.1.1(a) – the use of microscopy to observe and investigate different types of cell and cell structure in a range of eukaryotic organisms 2.1.1(b) – the preparation and examination of microscope slides for use in light microscopy 2.1.1(c) – the use of staining in light microscopy 2.1.1(d) – the representation of cell structure as seen under the light microscope using drawings and annotated diagrams 2.1.1(e) – the use and manipulation of the magnification formula 2.1.1(f) – the difference between magnification and resolution 2.1.1(g) – the ultrastructure of eukaryotic cells and the functions of the different cellular components 2.1.1(h) – photomicrographs of cellular components in a range of eukaryotic cells 2.1.1(i) – the interrelationship between the organelles involved in the production and secretion of proteins 2.1.1(j) – the importance of the cytoskeleton	**2.1.2 Biological molecules** 2.1.2(a) – hydrogen bonding between water molecules, and how the properties of water relate to its roles for living organisms 2.1.2(b) – monomers and polymers, and the importance of condensation and hydrolysis reactions 2.1.2(c) – the chemical elements that make up biological molecules 2.1.2(d) – the ring structure and properties of glucose (hexose) and the structure of ribose (pentose) 2.1.2(e) – the synthesis and breakdown of a disaccharide and polysaccharide by the formation and breakage of glycosidic bonds 2.1.2(f) – the structure of starch (amylose and amylopectin), glycogen and cellulose 2.1.2(g) – how the structures and properties of glucose, starch, glycogen and cellulose relate to their functions 2.1.2(h) – the structure of a triglyceride and a phospholipid 2.1.2(i) – the synthesis and breakdown of triglycerides by the formation and breakage of ester bonds	• K-Tests: cell structure and microscopes; eukaryotic and prokaryotic cells; carbohydrates; lipids • A Level Papers 1–3 (end of Year 13) • Practical Endorsement (CPAC): PAGs recorded in lab books • K-Test DIRT (green pen) after each sub-topic • In-class retrieval practice and exam questions • Homework activities

	carbohydrates, lipids and proteins relate to their functions.	2.1.1(k) – the similarities and differences in the structure and ultrastructure of prokaryotic and eukaryotic cells **2.1.6 Cell division, cell diversity and cellular organisation – begins** 2.1.6(a) – the cell cycle 2.1.6(b) – how the cell cycle is regulated **Key maths skills** **M0.1 / M0.2 –** use units and standard form, e.g. sizes of organelles **M2.2–M2.4 –** rearrange and use the magnification formula **M1.1 / M1.8 –** use significant figures and order of magnitude calculations **M1.3 –** interpret cell cycle diagrams **How Science Works (HSW)** **HSW1 / HSW7 –** how developments in microscopy have changed our understanding of cells **HSW4 –** prepare, stain and calibrate slides safely (supports PAG 1) **HSW8 –** produce accurate scientific drawings and use correct terminology	2.1.2(j) – how the properties of triglycerides, phospholipids and cholesterol relate to their functions 2.1.2(k) – the general structure of an amino acid 2.1.2(l) – the synthesis and breakdown of dipeptides and polypeptides by the formation and breakage of peptide bonds 2.1.2(m) – the levels of protein structure 2.1.2(q) – how to carry out and interpret the biuret, Benedict's, iodine and emulsion tests – Benedict's test (PAG 9.3) 2.1.2(r) – quantitative methods to determine the concentration of a substance in a solution (colorimetry) (PAG 5.2) **Core practicals** **PAG 9.3 – Qualitative testing:** Benedict's test for reducing sugars (2.1.2(q)). **PAG 5.2 – Colorimeter:** Determining the concentration of a glucose solution using a calibration curve (2.1.2(r)). **Key maths skills** **M1.1 / M1.3 –** record and present results in tables **M3.1 –** use a colorimeter calibration curve to find glucose concentration **How Science Works (HSW)** **HSW2 / HSW8 –** relate molecular structure to function using diagrams **HSW3–HSW5 –** carry out qualitative and quantitative tests (PAG 9.3, PAG 5.2)	

Beths Grammar School KS5 Biology Curriculum Map – Year 12 (teacher split)

<table>
<tr>
<td>Autumn Term 1B Year 12</td>
<td><u>Intent</u>
Why is this taught now?
Cell division follows naturally from cell structure. Nucleic acids follow proteins so students can link DNA to the polypeptides it codes for. Membranes begin once students understand phospholipids.

Teacher A: 2.1.6 Cell division, diversity and organisation, 2.1.5 Biological membranes (begins)

Teacher B: 2.1.2 Biological molecules (completed); 2.1.3 Nucleotides and nucleic acids

Big question: How do cells copy themselves and their DNA?
Learners study the cell cycle, mitosis and meiosis, how cells specialise, and the uses of stem cells. They complete biological molecules with globular and fibrous proteins, inorganic ions and chromatography, then learn the structure of DNA and RNA and how genes are replicated, transcribed and translated.</td>
<td>2.1.6 – continued
2.1.6(c) – the main stages of mitosis
2.1.6(d) – sections of plant tissue showing the cell cycle and stages of mitosis (PAG 1.1)
2.1.6(e) – the significance of mitosis in life cycles
2.1.6(f) – the significance of meiosis in life cycles
2.1.6(g) – the main stages of meiosis
2.1.6(h) – how cells of multicellular organisms are specialised for particular functions
2.1.6(i) – the organisation of cells into tissues, organs and organ systems
2.1.6(j) – the features and differentiation of stem cells
2.1.6(k) – the production of erythrocytes and neutrophils from a common stem cell in bone marrow
2.1.6(l) – the production of xylem vessels and phloem sieve tubes from a common stem cell in meristems
2.1.6(m) – the potential uses of stem cells in research and medicine

2.1.5 Biological membranes – begins
2.1.5(a) – the roles of membranes within cells and at the surface of cells
2.1.5(b) – the fluid mosaic model of membrane structure and the roles of its components

Core practicals
PAG 1.1 – Microscopy: Using a light microscope to study mitosis in a root tip squash (2.1.6(d)).</td>
<td>2.1.2 – continued
2.1.2(n) – the structure and function of globular proteins, including a conjugated protein
2.1.2(o) – the properties and functions of fibrous proteins
2.1.2(p) – the key inorganic ions involved in biological processes (independent / flipped study)
2.1.2(q) – how to carry out and interpret the biuret, Benedict’s, iodine and emulsion tests – protein and lipid tests (PAG 9.1, 9.2)
2.1.2(s) – the principles, uses and practical investigation of paper and thin layer chromatography

2.1.3 Nucleotides and nucleic acids
2.1.3(a) – the structure of a nucleotide as the monomer from which nucleic acids are made
2.1.3(b) – the synthesis and breakdown of polynucleotides by the formation and breakage of phosphodiester bonds
2.1.3(c) – the structure of ADP and ATP as phosphorylated nucleotides
2.1.3(d) – the structure of DNA, and practical investigations into the purification of DNA by precipitation
2.1.3(e) – semi-conservative DNA replication
2.1.3(f) – the nature of the genetic code
2.1.3(g) – transcription and translation of genes resulting in the synthesis of polypeptides

Core practicals
PAG 9.1 / 9.2 – Qualitative testing: Tests for proteins and lipids (2.1.2(q)).</td>
<td>• Year 12 internal assessment (Module 2 taught so far)
• Big test option: end of term (Module 2)
• K-Tests: cell cycle, mitosis and meiosis; cell diversity and stem cells; proteins and tests
• A Level Papers 1–3 (end of Year 13)

• Practical Endorsement (CPAC): PAGs recorded in lab books
• K-Test DIRT (green pen) after each sub-topic
• In-class retrieval practice and exam questions
• Homework activities</td>
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Beths Grammar School KS5 Biology Curriculum Map – Year 12 (teacher split)

		Key maths skills **M0.3 / M1.1 –** calculate mitotic index **M0.1 / M0.2 –** calculate real sizes of cells from micrographs **How Science Works (HSW)** **HSW4 –** use a light microscope to observe and draw stages of mitosis (PAG 1.1) **HSW2 / HSW5 –** explain the significance of mitosis and meiosis **HSW6 / HSW9 / HSW10 / HSW12 –** evaluate the uses and ethics of stem cells	**Key maths skills** **M0.1 / M0.2 / M1.1 –** use units and appropriate significant figures **M2.2–M2.4 –** calculate Rf values in chromatography **How Science Works (HSW)** **HSW3 / HSW4 –** carry out tests for proteins and lipids (PAG 9.1, PAG 9.2), chromatography and DNA purification **HSW8 –** describe replication, transcription and translation using correct terminology	
Spring Term 2A Year 12	**Intent** Why is this taught now? *Membranes and enzymes complete Module 2, using protein and lipid structure from the autumn. These ideas are needed for exchange surfaces (Module 3) and the immune system (Module 4), which both begin this half term.* **Teacher A: 2.1.5 Biological membranes; 4.1.1 Communicable diseases (begins)** **Teacher B: 2.1.3 (review); 2.1.4 Enzymes; 3.1.1 Exchange surfaces (begins)** **Big question:** *How do substances and signals get into and out of cells?* Learners investigate membrane permeability, diffusion and osmosis, and explain how enzymes work and what affects their activity. They	**2.1.5 – continued** 2.1.5(c) – factors affecting membrane structure and permeability, including practical investigations (PAG 5.1) 2.1.5(d) – the movement of molecules across membranes (diffusion, facilitated diffusion, active transport, endocytosis and exocytosis) 2.1.5(e) – the movement of water across membranes by osmosis, including practical investigations into the effects of solutions of different water potential (PAG 8.1) **4.1.1 Communicable diseases, disease prevention and the immune system – begins** 4.1.1(a) – the different types of pathogen that can cause communicable diseases in plants and animals (independent / flipped study) 4.1.1(b) – the means of transmission of animal and plant communicable pathogens	**2.1.3 Nucleotides and nucleic acids – topic review** **2.1.4 Enzymes** 2.1.4(a) – the role of enzymes in catalysing reactions that affect metabolism at a cellular and whole organism level 2.1.4(b) – the role of enzymes in catalysing both intracellular and extracellular reactions 2.1.4(c) – the mechanism of enzyme action 2.1.4(d) – the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity, including practical investigations (PAG 4.1) 2.1.4(e) – the need for coenzymes and cofactors in some enzyme-controlled reactions 2.1.4(f) – the effects of inhibitors on the rate of enzyme-controlled reactions **3.1.1 Exchange surfaces – begins** 3.1.1(a) – the need for specialised exchange surfaces	• Big test option: half term (Module 2 and early Modules 3 and 4) • K-Tests: biological membranes; nucleic acids; enzymes • A Level Papers 1–3 (end of Year 13) • Practical Endorsement (CPAC): PAGs recorded in lab books • K-Test DIRT (green pen) after each sub-topic

	begin Module 4 with the types of pathogen and how they spread, and Module 3 with why large organisms need specialised exchange surfaces.	**Core practicals** **PAG 5.1 – Colorimeter:** The effect of temperature on membrane permeability (2.1.5(c)). **PAG 8.1 – Transport in and out of cells:** Finding the water potential of potato (2.1.5(e)). **Key maths skills** **M0.3 / M1.2 –** calculate percentage change in mass and means **M3.1 / M3.2 –** plot and interpret graphs, e.g. finding the water potential of potato **M1.11 –** identify uncertainties in measurements **M1.5 / M1.7 –** interpret epidemiological data on disease transmission **How Science Works (HSW)** **HSW1–HSW6 –** plan, carry out, analyse and evaluate membrane and osmosis practicals (PAG 5.1, PAG 8.1) **HSW7 / HSW11 / HSW12 –** consider how social and climatic factors affect disease transmission	3.1.1(b) – the features of an efficient exchange surface **Core practicals** **PAG 4.1 – Rates of enzyme-controlled reactions:** The effect of substrate concentration on enzyme activity (2.1.4(d)). **Key maths skills** **M3.1 / M3.2 –** plot rate data from enzyme investigations **M3.5 / M3.6 –** calculate initial rate using a tangent to a curve **M2.3 –** use the temperature coefficient (Q10) **M1.11 –** identify uncertainties in measurements **M4.1 / M0.4 –** calculate surface area to volume ratios **How Science Works (HSW)** **HSW1 / HSW8 –** use lock and key and induced-fit models to explain enzyme action **HSW4–HSW6 –** plan, carry out and evaluate an enzyme investigation (PAG 4.1)	• In-class retrieval practice and exam questions • Homework activities
Spring Term 2B Year 12	**<u>Intent</u>** Why is this taught now? *The immune system builds on cell signalling, membranes and protein structure from Module 2. Gas exchange and transport in animals build on surface area to volume ratio and specialised cells.* **Teacher A: 4.1.1 Communicable diseases, disease prevention and the immune system**	**4.1.1 – continued** 4.1.1(c) – plant defences against pathogens 4.1.1(d) – the primary non-specific defences against pathogens in animals 4.1.1(e) – the structure and mode of action of phagocytes 4.1.1(f) – the structure, different roles and modes of action of B and T lymphocytes in the specific immune response 4.1.1(g) – the primary and secondary immune responses	**3.1.1 – continued** 3.1.1(c) – the structures and functions of the components of the mammalian gaseous exchange system 3.1.1(d) – the mechanism of ventilation in mammals 3.1.1(e) – the relationship between vital capacity, tidal volume, breathing rate and oxygen uptake 3.1.1(f) – the mechanisms of ventilation and gas exchange in bony fish and insects	• Big test option: end of term (Module 2 and Modules 3 and 4 to date) • K-Tests: pathogens and defences; exchange surfaces and breathing

Beths Grammar School KS5 Biology Curriculum Map – Year 12 (teacher split)

	Teacher B: 3.1.1 Exchange surfaces; 3.1.2 Transport in animals (begins) **Big question:** *How does the body defend itself and get oxygen to every cell?* Learners study plant and animal defences, the specific immune response, antibodies, vaccination and antibiotics. They also study the mammalian gas exchange system, ventilation in mammals, fish and insects, and the need for circulatory systems and blood vessels.	4.1.1(h) – the structure and general functions of antibodies 4.1.1(i) – an outline of the action of opsonins, agglutinins and anti-toxins 4.1.1(j) – the differences between active and passive immunity, and between natural and artificial immunity 4.1.1(k) – autoimmune diseases 4.1.1(l) – the principles of vaccination and the role of vaccination programmes in the prevention of epidemics 4.1.1(m) – possible sources of medicines 4.1.1(n) – the benefits and risks of using antibiotics to manage bacterial infection **Key maths skills** **M1.3 –** interpret graphs of primary and secondary immune responses **M1.2 / M1.5 / M1.7 / M3.1 –** analyse vaccination and disease data **How Science Works (HSW)** **HSW8 –** sequence the immune response using correct terminology **HSW9 / HSW11 / HSW12 –** evaluate vaccination programmes, sources of medicines and antibiotic use **HSW7 –** how medicines and personalised medicine are developing	3.1.1(h) – the examination of microscope slides to show the histology of exchange surfaces (PAG 1.3) **3.1.2 Transport in animals – begins** 3.1.2(a) – the need for transport systems in multicellular animals 3.1.2(b) – the different types of circulatory systems 3.1.2(c) – the structure and functions of arteries, arterioles, capillaries, venules and veins **Core practicals** **PAG 1.3 – Microscopy:** Examining and drawing lung tissue (3.1.1(h)). **Key maths skills** **M0.1 / M1.1 / M1.3 –** calculate tidal volume, breathing rate and oxygen uptake from spirometer traces **M4.1 –** calculate surface area to volume ratios **How Science Works (HSW)** **HSW4 –** examine and draw lung tissue using a light microscope (PAG 1.3) **HSW2–HSW6 –** analyse primary and secondary spirometer data **HSW8 –** describe ventilation and gas exchange using correct terminology	• A Level Papers 1–3 (end of Year 13) • Practical Endorsement (CPAC): PAGs recorded in lab books • K-Test DIRT (green pen) after each sub-topic • In-class retrieval practice and exam questions • Homework activities

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<tr>
<td>Summer Term 3A Year 12</td>
<td><u>Intent</u>
Why is this taught now?
Classification and evolution use ideas about DNA, variation and disease from earlier topics. The heart and haemoglobin follow on from blood vessels, and transport in plants mirrors transport in animals.
Teacher A: 4.1.1 (review); 4.2.2 Classification and evolution

Teacher B: 3.1.2 Transport in animals; 3.1.3 Transport in plants (begins)

Big question: How are living things related, and how do they move substances around?
Learners study how organisms are classified, the evidence for evolution, variation and natural selection, including statistical analysis. They also study tissue fluid, the heart, the cardiac cycle, ECGs and haemoglobin, then begin the plant vascular system. The Year 12 trial exams take place this half term.</td>
<td>4.1.1 – topic review

4.2.2 Classification and evolution
4.2.2(a) – the biological classification of species
4.2.2(b) – the binomial system of naming species and the advantage of such a system
4.2.2(c) – the features used to classify organisms into the five kingdoms, and the evidence for the three domains

Year 12 trial exams (no lessons for two weeks)

4.2.2 – continued
4.2.2(d) – the relationship between classification and phylogeny
4.2.2(e) – the evidence for the theory of evolution by natural selection
4.2.2(f) – the different types of variation
4.2.2(g) – the different types of adaptations of organisms to their environment
4.2.2(h) – the mechanism by which natural selection can affect the characteristics of a population over time
4.2.2(i) – how evolution in some species has implications for human populations

Key maths skills
M1.2 / M1.6 / M1.10 – use mean, median, mode, range and standard deviation to describe variation
M1.7 / M1.9 – select and use statistical tests, e.g. Spearman’s rank and the t-test
M0.3 – use proportions to describe changes in a population
How Science Works (HSW)</td>
<td>3.1.2 – continued
3.1.2(d) – the formation of tissue fluid from plasma
3.1.2(e) – the external and internal structure of the mammalian heart, including dissection (PAG 2.1)

Year 12 trial exams (no lessons for two weeks)

3.1.2 Transport in animals – continued
3.1.2(f) – the cardiac cycle
3.1.2(g) – how heart action is initiated and coordinated
3.1.2(h) – the use and interpretation of electrocardiogram (ECG) traces
3.1.2(i) – the role of haemoglobin in transporting oxygen and carbon dioxide
3.1.2(j) – the oxygen dissociation curve for fetal and adult human haemoglobin

3.1.3 Transport in plants – begins
3.1.3(a) – the need for transport systems in multicellular plants
3.1.3(b) – the structure and function of the vascular system in roots, stems and leaves, including examination of stained sections and dissection of stems – structure and function (dissection follows in Summer 3B)
3.1.3(d) – the transport of water into the plant, through the plant and to the air surrounding the leaves

Core practicals
PAG 2.1 – Dissection: Dissection of the mammalian heart (3.1.2(e)).</td>
<td>• Year 12 trial exams (Modules 2–4 taught to date)
• K-Tests: immunity, vaccination and medicines; transport in animals
• A Level Papers 1–3 (end of Year 13)

• Practical Endorsement (CPAC): PAGs recorded in lab books
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		HSW1 / HSW7 / HSW11 – how classification has changed as new evidence has emerged **HSW5 / HSW6 –** evaluate evidence for evolution **HSW9 / HSW12 –** implications of pesticide and drug resistance	**Key maths skills** **M2.3 –** use cardiac output = heart rate × stroke volume **M0.1 / M1.1 / M2.4 –** calculate heart rate from ECG traces **M3.1 –** interpret oxygen dissociation curves, including the Bohr effect **How Science Works (HSW)** **HSW4 –** dissect, examine and draw the mammalian heart (PAG 2.1) **HSW2 / HSW5 / HSW8 –** explain the cardiac cycle and interpret ECGs	
Summer Term 3B Year 12	**Intent** Why is this taught now? *Biodiversity brings together classification, variation and sampling, and prepares students for ecosystems in Year 13. Transport in plants completes Module 3, before an end-of-year review of Modules 1–4.* **Teacher A: 4.2.2 (review); 4.2.1 Biodiversity** **Teacher B: 3.1.3 Transport in plants (completed)** **Big question:** *Why does biodiversity matter, and how do we protect it?* Learners measure biodiversity in the field, calculate Simpson's Index of Diversity, and evaluate the factors that affect biodiversity and how it can be conserved. They also complete transpiration and	**4.2.2 Classification and evolution – topic review** **4.2.1 Biodiversity** 4.2.1(a) – how biodiversity may be considered at different levels 4.2.1(b) – how sampling is used in measuring the biodiversity of a habitat, including practical investigations in the field (PAG 3.2) 4.2.1(c) – how to measure species richness and species evenness in a habitat 4.2.1(d) – the use and interpretation of Simpson's Index of Diversity (D) (PAG 3.1) 4.2.1(e) – how genetic biodiversity may be assessed, including calculations 4.2.1(f) – the factors affecting biodiversity 4.2.1(g) – the ecological, economic and aesthetic reasons for maintaining biodiversity (independent / flipped study) 4.2.1(h) – in situ and ex situ methods of maintaining biodiversity	**3.1.3 – continued** 3.1.3(b) – the structure and function of the vascular system in roots, stems and leaves, including examination of stained sections and dissection of stems (PAG 2.2) 3.1.3(c) – the process of transpiration and the environmental factors that affect it, including practical investigations to estimate transpiration rates (PAG 5.3, demonstration) 3.1.3(e) – adaptations of plants to the availability of water in their environment (independent / flipped study) 3.1.3(f) – the mechanism of translocation **Core practicals** **PAG 2.2 – Dissection:** Dissection of a stem to show the position of xylem (3.1.3(b)). **PAG 5.3 – Potometer:** Estimating transpiration rate (3.1.3(c)) – teacher demonstration.	• Trial exam feedback and DIRT • K-Tests: classification and evolution; biodiversity; transport in plants • End-of-year review • A Level Papers 1–3 (end of Year 13) • **Biodiversity: evaluate the sustainability of different farming approaches** • Practical Endorsement (CPAC): PAGs

	translocation. The year ends with trial exam feedback, a skills review and exam practice.	4.2.1(i) – international and local conservation agreements made to protect species and habitats **SUSTAINABILITY IN CONTEXT – extension of the 4.2.1(f) factors affecting biodiversity lesson** Once students can explain how human population growth, monoculture and climate change reduce biodiversity, they apply this to how land is farmed: • **Apply:** use data to compare biodiversity in monoculture farmland with land managed for wildlife, e.g. hedgerows and field margins. • **Evaluate:** weigh food production against biodiversity loss, and decide which approaches make farming more sustainable. **How Science Works:** HSW10 – ethical issues for the environment; HSW12 – how society uses science to make decisions. **Links:** 4.2.1(h)–(i) conservation and the Countryside Stewardship Scheme; Year 13 Module 6 ecosystems and sustainability. **Core practicals** **PAG 3.2 – Sampling techniques:** Measuring the distribution and abundance of plants (4.2.1(b)). **PAG 3.1 – Sampling techniques:** Calculating species diversity (4.2.1(c)–(d)). **Key maths skills**	**Key maths skills** **M1.2 / M1.3 / M1.6 –** process potometer data **M3.1–M3.6 –** plot graphs and calculate rates of water uptake **M4.1 –** calculate the volume of water taken up using $\pi r^2 \times$ distance **How Science Works (HSW)** **HSW4 –** dissect and draw a stem (PAG 2.2) and use a potometer (PAG 5.3, demonstration) **HSW2–HSW6 / HSW8 –** explain and evaluate transpiration and translocation evidence	recorded in lab books • K-Test DIRT (green pen) after each sub-topic • In-class retrieval practice and exam questions • Homework activities

		M1.5 / M1.4 – understand the principles of sampling and simple probability **M2.3 / M2.4 / M1.1 –** calculate Simpson's Index of Diversity and proportion of polymorphic gene loci **M1.3 / M1.7 / M3.1 –** interpret data on factors affecting biodiversity **How Science Works (HSW)** **HSW4–HSW6 –** plan and carry out random and non-random sampling in the field (PAG 3.1, PAG 3.2) **HSW7 / HSW9 / HSW10 / HSW12 –** evaluate conservation methods and agreements		