The Island VI Form

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Post-16 Curriculum - Biology

Subject Curriculum Overview

Subject	Biology
Qualification / Specification	A-level Biology / 7402
Awarding Body	AQA
Level	3
Curriculum Lead	Paul Clarkson
Teaching Staff	Clare O'Shaughnessy
Guided Learning Hours	360
Year(s) Delivered	12 & 13
Last Review Date	June 2026
Next Review Date	June 2027

1. Curriculum Intent

Biology A-level extends knowledge and skills from KS4 to develop and demonstrate a deep appreciation of the knowledge and understanding of scientific ideas, processes, techniques and procedures and how they relate to each other. Biology will develop competence and confidence in a variety of practical, mathematical and problem solving skills through the application of knowledge and understanding of scientific ideas, processes, techniques and procedures in both theoretical and practical contexts and the handling of both qualitative and quantitative data. Develop interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject. Analyse, interpret and evaluate scientific information, ideas and evidence to make judgements and reach conclusions and develop and to develop and refine practical design and procedures. This will help you to understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society.

A Level Biology is an excellent base for a university degree. The ability to understand and apply difficult concepts alongside the practical, analytic and problem solving skills learnt whilst studying Biology will be valuable in further education and/or employment.
Biology will open the door to a multitude of career options including: Healthcare & Medicine, Medicine, Dentistry, Pharmacy, Veterinary Science, and Nursing. Life Sciences: Biochemistry, Genetics, Microbiology, and Biomedical Engineering. Environment & Agriculture: Marine Biology, Conservation, Ecology, and Agricultural Sciences.

Success in A-Level Biology requires transitioning from simply memorising facts at GCSE to mastering three core pillars: content recall, application to unfamiliar scenarios, and precise exam technique. Success will be the ability to understand and apply core ideas flexibly, rather than recall isolated facts, to both familiar and unfamiliar contexts. To coherently explain ideas using the correct terminology. To problem solve and think through concepts and ideas to consider different causes and effects. Carry out practical investigations independently, safely and accurately, making adjustments as needed whilst following complex methods and using specialist equipment. To analyse and present data patterns and to apply knowledge to form conclusions. To evaluate data and methods whilst considering the impact of multiple variables on the outcomes.

2. Foundational Knowledge

Area	Essential Knowledge / Skills	Why It Matters
	Develop essential knowledge and understanding of different areas of the subject and how they relate to each other.	To recall and explain ideas in order to apply them to familiar examples.
Biological Molecules	Recall & Describe structure and bonding to form Carbohydrates Lipids Proteins Students could use, and interpret the results of, qualitative tests for reducing sugars, non-reducing sugars and starch. Enzymes Structure of nucleic acids DNA replication ATP Water Inorganic ions	The variety of life, both past and present, is extensive, but the biochemical basis of life is similar for all living things. Monomers are the smaller units from which larger molecules are made. Polymers are molecules made from a large number of monomers joined together. Monosaccharides, amino acids and nucleotides are examples of monomers. A condensation reaction joins two molecules together with the formation of a chemical bond and involves the elimination of a molecule of water. A hydrolysis reaction breaks a chemical bond between two molecules and involves the use of a water molecule.
Cells: Cell Structure, division, transport & immune system.	Structure of eukaryotic cells Structure of prokaryotic cells and of viruses Methods of studying cells All cells arise from other cells.	All life on Earth exists as cells. These have basic features in common. Differences between cells are due to the addition of extra features. This provides indirect evidence for evolution. All cells arise from other cells, by binary fission in prokaryotic cells and by mitosis and meiosis in eukaryotic cells. All cells have a cell-surface membrane and, in addition, eukaryotic cells have internal membranes. The basic structure of these membranes is the same and

	Transport across the cell membranes Cell recognition and the immune system	enables control of the passage of substances across exchange surfaces by passive or active transport. Cell-surface membranes contain embedded proteins. Some of these are involved in cell signalling – communication between cells. Others act as antigens, allowing recognition of 'self' and 'foreign' cells by the immune system. Interactions between different types of cell are involved in disease, recovery from disease and prevention of symptoms occurring at a later date if exposed to the same antigen, or antigen-bearing pathogen.
Organisms exchange substances with their environment: Exchange and transport.	Surface area to volume ratio Gas Exchange Digestion and absorption Mass transport in animals Mass transport in plants	The internal environment of a cell or organism is different from its external environment. The exchange of substances between the internal and external environments takes place at exchange surfaces. To truly enter or leave an organism, most substances must cross cell plasma membranes. In large multicellular organisms, the immediate environment of cells is some form of tissue fluid. Most cells are too far away from exchange surfaces, and from each other, for simple diffusion alone to maintain the composition of tissue fluid within a suitable metabolic range. In large organisms, exchange surfaces are associated with mass transport systems that carry substances between the exchange surfaces and the rest of the body and between parts of the body. Mass transport maintains the final diffusion gradients that bring substances to and from the cell membranes of individual cells. It also helps to maintain the relatively stable environment that is tissue fluid.
Genetic information, variation and relationships between organisms: Protein Synthesis, Diversity, selection, & classification.	DNA, genes and chromosomes DNA and protein synthesis Genetic diversity can arise as as result of mutation or during meiosis Genetic diversity and adaptation Species and taxonomy Biodiversity within a community Investigating diversity	Biological diversity – biodiversity – is reflected in the vast number of species of organisms, in the variation of individual characteristics within a single species and in the variation of cell types within a single multicellular organism. Differences between species reflect genetic differences. Differences between individuals within a species could be the result of genetic factors, of environmental factors, or a combination of both. A gene is a section of DNA located at a particular site on a DNA molecule, called its locus. The base sequence of each gene carries the coded genetic information that determines the sequence of amino acids during protein synthesis. The genetic code used is the same in all organisms, providing indirect evidence for evolution. Genetic diversity within a species can be caused by gene mutation, chromosome mutation or random factors associated with meiosis and fertilisation. This genetic diversity is acted upon by natural selection, resulting in species becoming better adapted to their environment. Variation within a species can be measured using differences in the base sequence of DNA or in the amino acid sequence of proteins. Biodiversity within a community can be measured using species richness and an index of diversity.

Energy transfers in and between organisms: Photosynthesis, respiration, energy transfers & nutrient cycles.	Photosynthesis Respiration Energy and ecosystems Nutrient Cycles	Life depends on continuous transfers of energy. In photosynthesis, light is absorbed by chlorophyll and this is linked to the production of ATP. In respiration, various substances are used as respiratory substrates. The hydrolysis of these respiratory substrates is linked to the production of ATP. In both respiration and photosynthesis, ATP production occurs when protons diffuse down an electrochemical gradient through molecules of the enzyme ATP synthase, embedded in the membranes of cellular organelles. The process of photosynthesis is common in all photoautotrophic organisms and the process of respiration is common in all organisms, providing indirect evidence for evolution. In communities, the biological molecules produced by photosynthesis are consumed by other organisms, including animals, bacteria and fungi. Some of these are used as respiratory substrates by these consumers. Photosynthesis and respiration are not 100% efficient. The transfer of biomass and its stored chemical energy in a community from one organism to a consumer is also not 100% efficient.
Organisms respond to changes in their internal and external environments: Stimuli & response, nervous coordination & homeostasis.	Survival and response Receptors Control of heart rate Nerve impulses Synaptic transmission Skeletal muscles are stimulated to contract by nerves and act as effectors Principles of homeostasis and negative feedback Control of blood glucose concentration Control of blood water potential	A stimulus is a change in the internal or external environment. A receptor detects a stimulus. A coordinator formulates a suitable response to a stimulus. An effector produces a response. Receptors are specific to one type of stimulus. Nerve cells pass electrical impulses along their length. A nerve impulse is specific to a target cell only because it releases a chemical messenger directly onto it, producing a response that is usually rapid, short-lived and localised. In contrast, mammalian hormones stimulate their target cells via the blood system. They are specific to the tertiary structure of receptors on their target cells and produce responses that are usually slow, long-lasting and widespread. Plants control their response using hormone-like growth substances.
Genetics, populations & evolution and ecosystems.	Inheritance Populations Evolution may lead to speciation	The theory of evolution underpins modern Biology. All new species arise from an existing species. This results in different species sharing a common ancestry, as represented in phylogenetic classification. Common ancestry can explain the similarities between all living organisms, such as common chemistry (e.g. all proteins made from the same 20 or so amino acids), physiological pathways (eg

	Populations in ecosystems.	anaerobic respiration), cell structure, DNA as the genetic material and a 'universal' genetic code. The individuals of a species share the same genes but (usually) different combinations of alleles of these genes. An individual inherits alleles from their parent or parents. A species exists as one or more populations. There is variation in the phenotypes of organisms in a population, due to genetic and environmental factors. Two forces affect genetic variation in populations: genetic drift and natural selection. Genetic drift can cause changes in allele frequency in small populations. Natural selection occurs when alleles that enhance the fitness of the individuals that carry them rise in frequency. A change in the allele frequency of a population is evolution. If a population becomes isolated from other populations of the same species, there will be no gene flow between the isolated population and the others. This may lead to the accumulation of genetic differences in the isolated population, compared with the other populations. These differences may ultimately lead to organisms in the isolated population becoming unable to breed and produce fertile offspring with organisms from the other populations. This reproductive isolation means that a new species has evolved. Populations of different species live in communities. Competition occurs within and between these populations for the means of survival. Within a single community, one population is affected by other populations, the biotic factors, in its environment. Populations within communities are also affected by, and in turn affect, the abiotic (physicochemical) factors in an ecosystem.
The control of gene expression: Mutations & gene expression. Genome projects & gene technologies	Alteration of the sequence of bases in DNA can alter the structure of proteins Gene expression is controlled by a number of features: Most of the cells's DNA is not translated Regulation of transcription and translation Gene expression and cancer Using genome projects Gene technologies allow the study and alteration of gene function allowing a better understanding of organism function and the design of new industrial and medical processes: Recombinant DNA technology	Cells are able to control their metabolic activities by regulating the transcription and translation of their genome. Although the cells within an organism carry the same coded genetic information , they translate only part of it. In multicellular organisms, this control of translation enables cells to have specialised functions, forming tissues and organs. There are many factors that control the expression of genes and, thus, the phenotype of organisms. Some are external, environmental factors, others are internal factors. The expression of genes is not as simple as once thought, with epigenetic regulation of transcription being increasingly recognised as important. Humans are learning how to control the expression of genes by altering the epigenome, and how to alter genomes and proteomes of organisms. This has many medical and technological applications. Consideration of cellular control mechanisms underpins the content of this section. Students who have studied it should develop an understanding of the ways in which organisms and cells control their activities. This should lead to an appreciation of common ailments resulting from a breakdown of these

	Differences in DNA between individuals of the same species can be exploited for identification and diagnosis of heritable conditions Genetic fingerprinting	control mechanisms and the use of DNA technology in the diagnosis and treatment of human diseases.
Mathematical skills Overall, at least 10% of the marks in assessments for biology will require the use of mathematical skills. These skills will be applied in the context of biology A-level and will be at least the standard of higher tier GCSE mathematics.	5 skill areas: Arithmetic and numerical computation Handling data Algebra Graphs Geometry and trigonometry	To record and analyse data. To change the format to present data To form conclusions from data To estimate results To demonstrate and develop working with precision and attention to detail To identify uncertainties in measurements. Some specific examples are: To calculate SA:Vol ratio Represent phenotypic ratios Use power, exponential and logarithmic functions useful for growth of cells Use of statistical tests to analyse data. Calculate uncertainty and %error to select equipment and evaluate results.
Practical assessment Practical work is the basis of biology. Practical assessments have been divided into those that can be assessed in written exams and those that can only be directly assessed whilst students are carrying out experiments. A-level grades will be based only on marks from written exams. At least 15% of the A-level will require assessment of practical skills. A separate endorsement of practical skills will be taken alongside the	Independent thinking Use and application of scientific methods and practices Numeracy and the application of mathematical concepts in a practical context Instruments and equipment Carrying out the 12 required practicals . Students will have experienced use of key apparatus and techniques. Students will have demonstrated competency across the 5 key skills areas.	Use of apparatus and techniques: All students taking an A-level Biology qualification are expected to have had opportunities to use specialist apparatus and develop and demonstrate key techniques. These apparatus and techniques are common to all A-level Biology specifications. Follow written procedures Correctly uses instruments and equipment to collect accurate results. Identifies hazards and risks to work safely. Make accurate observations and record these correctly. Processes data and researches results to form conclusions. Cites sources correctly. Competency in these skills will gain a practical PASS mark.

A-level. This will be assessed by teachers and will be based on direct observation of students' competency in a range of skills that are not assessable in written exams.		

3. Powerful Knowledge

Powerful Knowledge Area	Why It Matters	Evidence of Understanding
Required practicals 1-12 Focus on PAG 1,6, 7,8,9,11,12. Greater focus on planning, controls, technique and conclusions.	Application of practical and maths skills and scientific knowledge. These are essential skills that can be applied to any degree/future employment. They are key for a science based degree.	Pass PAG skills. Demonstrate independent thinking, use and apply scientific methods & practices, process and analyse data.
STEM club	Develop practical techniques and investigative procedures	Increased competence in PAG skills and of experimental procedures.
Paper 3	Synoptic paper worth 30% A-level. Focus on analysis, interpretation, evaluation of information, ideas and evidence in order to make judgements and reach conclusions. Develop and refine practical design and procedures.	PAG write ups. Practice questions. Data activities in lessons. Grade C or above in this paper.
Wider reading - links in lessons, HWk tasks. My super curricular. Links on goggleclassroom. Citizen science projects.	Develop your understanding and appreciation of science. Develop scientific literacy. UCAS/job applications. Preparation for your interviews and future degree.	Ability to interpret more unfamiliar examples. Bring ideas into class discussions. Access higher mark band in paper 3 synoptic essay. UCAS personal statement.
Intermediate Biology Olympiad - yr12 (June) Biology Olympiad -yr13 (Jan)	Higher level problem solving. Application of knowledge and wider reading to unfamiliar examples.	Completion of Olympiad - Highly commended or above.
Extra curricular activities: trips, online talks, career opportunities.	Real world applications of knowledge. Develop science skills and literacy.	UCAS personal statement - evidence of evaluation and critical thinking based on these experiences. Ability to interpret unfamiliar examples.
Using imagination to model complex ideas and find ways to learn and remember them.	Part of the scientific process of invention. To test models and theories and evaluate them.	Completion of resources and ability to communicate your ideas. Evaluation of each other's ideas/models. Able to answer application questions.

	In the class room it will help you to break down ideas and test your understanding.	

4. Curriculum Implementation

Term / Unit	Key Content	Foundational Knowledge	Powerful Knowledge	Assessment Opportunities
Yr 12 - Autumn 1	3.2.1 Cell structures Cornell notes & summaries. Introduction to key practical skills:	Cell structures, cell transport. Graphs & tables Microscope skills Magnification calculations Uncertainties Colorimeter Water baths	Produce temporary mounts and draw to scale. Apply theory to interpret micrographs.	Recall quizzes Summaries Practice PAG AS question on cells
Yr 12 - Autumn2	3.2.3 transport across cell membranes Continued development of practical skills	Cell transport Cell division Cells and the immune system Practice PAG Serial dilutions and calculations	Co-transport PAG 3 PAG 4 View and draw cells undergoing Mitosis. Calculate and mitotic index.	Recall quizzes Summaries PAGs AS questions on cells, microscopes & transport
Yr 12 - Spring 1	3.2.2. All cells arise from other cells. 3.3 SA:Vol ratio Maths skills ratios, volumes, Practical investigation in SA;Vol ratio. 3.3.2 Gas Exchange	Cells and the immune system SA:Vol ratio, application of transport from topic 2. Structure to function in single cell organism, insects, fish, plant, human.	PAG 2 or revision in Term 3. Wider reading opportunities to support: Evaluate methodology, evidence and data relating to use of vaccine and monoclonal antibodies.	Reading task: cell signalling. Recall quizzes Summaries PAGs AS questions on cells, microscopes & transport
Yr 12 - Spring 2	3.3.3 Mass transport in animals	Structure & function cardio vascular system. Formation of tissue fluid. Role of Hb and interpretation of dissociation curves.	PAG 5 Analyse, interpret & evaluate data: This topic associated with risk factors and disease. Mass flow hypothesis.	Recall quizzes Summaries PAGs Power hour AS

	3.3.4.2 Mass transport in plants Graph skills Correlation v causation and experimental design Revision skills & exam technique 3.1 Biological molecules -GCSE recap and introduction. 3.1.1 Monomers & Polymers. 3.1.6 ATP & 3.1.8 Inorganic ions 3.1.2 Carbohydrates 3.1.7 Water	Cohesion tension theory. Mass Flow hypothesis. Atoms, formulae, bonding. Hydrolysis & Condensation reactions. ATP cycle Ions in Biology. Mono, Di & Polysaccharide: formation, structure, function.	Evaluate conflicting evidence. Problem solve to set up a potometer. Food tests - PAG skills.	Disease research tasks: lung disease & CV disease. PAG's AS questions on all content to date Topic 2 &3
Yr 12 - Summer 1	3.1.3 Lipids 3.1.4 Proteins 3.1.4.1 General properties. 3.1.4.2 Enzymes Graph/maths skills: Calculating rate of reaction.	Triglycerides & Phospholipids: Formation, structure, function. Amino acids, Di & Polypeptides Structure, formation & function. Enzyme action and the effects of factors on enzyme controlled reactions Formation, Structure & function. Semi-conservative replication of DNA.	Revision for intermediate Biology Olympiad Model enzyme action PAG 1	Recall quizzes Summaries PAGs Power hour AS/A2

	3.1.5 Nucleic acids 3.1.5.1 Structure of DNA & RNA 3.1.5.2 DNA replication 3.4.1 DNA, genes & chromosomes 3.4.2 DNA & protein synthesis	Key terminology. DNA in prokaryotes v eukaryotes Structure of mRNA & tRNA. Process of transcription & translation. Interpret data about the genetic code.	Evaluate models of DNA replication.	
Yr 12 - Summer 2	3.4.3 Genetic diversity can arise as a result of mutation or during meiosis. Maths skills use the expression 2^n to calculate the possible number of different combinations of chromosomes following meiosis, without crossing over 3.4.4 Genetic diversity and adaptation. PAG 6 prep- introduce aseptic technique.	Mutations - causes and types and the effects on protein structure. Meiosis and the formation of genetically different daughter cells. Genetic diversity. And factors that increase and decrease this in a population. Evolution by natural selection. Types of selection and adaptation. Definition of a species and role of courtship behaviour. Phylogenetic classification.	Intermediate Biology Olympiad Apply knowledge of mitosis and meiosis to unfamiliar life cycles. Identify meiosis in prepared slides of plant and animal tissue. PAG 6	Recall tasks. Summaries PAGs Power hour A2 Practice paper Olympiad results. End of year mock exam Topics 1-4.

	3.4.5 Species and taxonomy. 3.4.6 Biodiversity within a community. Maths skill: using a formula to calculate an index of diversity.. 3.4.7 Investigating diversity. Maths skill - interpret standard deviation and error bars. Calculate standard deviation as practice of use of a formulae. 3.7.4 Populations in ecosystems Practice skills for PAG 12.	Define biodiversity and species richness. Calculate index of diversity and interpret the results. Ways to measure genetic diversity within or between species. Interpret data on genetic diversity. How data can be collected quantitatively and analyse this data to include mean and standard deviation. Populations Community and Ecosystems.The size of a population can be estimated using: randomly placed quadrats, or quadrats along a belt transect, for slow-moving or non-motile organisms the mark-release-recapture method for motile organisms. The assumptions made when using the mark-release-recapture method.	Advances in immunology and genome sequencing help to clarify evolutionary relationships between organisms. Summer task: PAG 12. Plan and collect data to investigate an environmental factor on an organism.	
Yr 13 - Autumn 1	3.7.4 Populations in ecosystems	Niche, Competition, Succession, Conservation.		HWk Succession of plant life.

	Statistical analysis Kite graph & data analysis. 3.5.2 Respiration 3.5.1 Photosynthesis	Hypothesis and significance. Types of statistical test. Using Spearman's rank. Stages of respiration: Glycolysis, Aerobic: link Reaction, Krebs Cycle, Oxidative Phosphorylation. Anaerobic: Ethanol or lactate pathways. Other respiratory substrates. Light Dependent Stage.	 Using respirometers to measure rate of respiration. PAG 9 Biological molecules and ATP.	HWk human needs v conservation research task. Recall tasks Summaries Power Hour End of topic test
Yr 13 - Autumn 2	3.5.1 Photosynthesis	Light independent stage (Calvin cycle). Limiting Factors.	PAG 7 PAG 8 Evaluate Data relating to agriculture to overcome limiting factors.	Recall tasks Summaries Power Hour End of topic test November mock exam Paper 1
Year 13 - Spring 1	3.5.3 Energy and ecosystems. 3.5.4 Nutrient cycles.	Role of plants in ecosystems. Calculate GPP, NPP, N. Consider how farming practices increase efficiency of energy transfer. Energy Nitrogen & phosphorous cycle.		Hwk energy transfers and Nutrient cycles resource making task. Recall tasks Summaries Power Hour End of topic test

	3.7.1 Inheritance	Monohybrid, Dihybrid crosses. Co-dominance. Sex-linkage, autosomal linkage, epistasis. Use of Chi squared. Chi -squared test. Gene pool, allele frequency. Hardy-Weinberg principle.	Recognise and problem solve to represent phenotypic ratios in genetic diagrams.	
	3.7.2 Populations	Genetic drift and its importance in small populations. Allopatric & sympatric speciation. Evolution as a change in allele frequencies. Evolution over time leads to diversity of species.		
	3.7.3 Evolution may lead to speciation	Types of response and how they increase the chances of survival: Tropisms, Taxes, Kineses. Pacinian corpuscle. Rods & Cones. Myogenic stimulation of the heart and wave of electrical activity. Baroreceptors and Chemoreceptors. Generation of an action potential. Myelinated and non-myelinated neurones. Factors affecting the speed of conductance.	Genetic variation. Differential reproductive success due to competition. Types of selection. Genetic bottlenecks and founder effect. PAG 10. Chi squared test.	February mock exam Paper 2 (part)
	3.6.1.1 Survival and response	Detailed structure of a synapse and neuromuscular junction.		

		Types of transmission across a synapse.		
	3.6.1.2 Receptors 3.6.1.3 control of heart rate	Structure of skeletal muscle. Muscle contraction. Slow v Fast twitch muscle. Role of ATP and phosphocreatine.	Cardiac cycle	
	3.6.2 Nervous coordination. 3.6.2.1 Nerve impulses		Receptors. Na/K pump. Electrochemical gradients.	
	3.6.2.2 Synaptic transmission		Types of transport Generation of action potentials. Predict and explain the effects of types of drugs on a synapse. Cell organelles Action potential Neuromuscular junction. Proteins ATP View and recognise structures on micrograph and on slide.	

	3.6.3 Skeletal muscles are stimulated to contact by nerves and act as effectors.			
Yr 13 - Spring 2	3.6.4 Homeostasis is the maintenance of a stable internal environment. 3.6.4.1 Principles of homeostasis and negative feedback. 3.6.4.2 Control of blood glucose concentration 3.6.4.3 Control of blood water potential	The principle of homeostasis in mammals. Examples of homeostasis and negative feedback. Positive feedback systems. Factors that influence blood glucose concentration. Role of the liver, action of insulin and glucagon. Role of adrenaline. Second messenger model. Type 1 &2 diabetes. Osmoregulation as a control of blood water potential. Structure and function of kidney nephron. Role of brain and ADH in osmoregulation Relate nature of a gene mutation to its effect on the encoded polypeptide.	Interpret information relating to examples of negative and positive feedback. Cells Water potential Enzymes Proteins Immune response Positive feedback Enzymes Proteins ATP Cell membranes Evaluate the role positions of health advisers and the food industry in relation to the increased incidence of type II diabetes. Transport Cell membranes Tissue fluid Countercurrent PAG 11 DNA Protein structure Protein synthesis	Recall tasks Summaries Power Hour End of topic test

	3.8 The control of gene expression. 3.8.1 Alteration of the sequence of bases in DNA can alter the structure of proteins. 3.8.2.1 Gene expression is controlled by a number of features. 3.8.2.1 Most of the cell's DNA is not translated. 3.8.2.2 regulation of transcription and translation. 3.8.2.3 Gene expression and cancer.	Types of stem cells. Evaluate the use of stem cells in treating human disorders. Stimulation or inhibition of the transcription of target genes in eukaryotes: Oestrogen, epigenetic control, RNAi. Role of tumour suppression genes, oncogenes, methylation of genes and oestrogen on the development of tumors.	Mutations Translation Mitosis Cell cycle DNA/RNA Interpret data provided from investigations into gene expression Evaluate appropriate data for the relative influences of genetic and environmental factors on phenotype. evaluate evidence showing correlations between genetic and environmental factors and various forms of cancer interpret information relating to the way in which an understanding of the roles of oncogenes and tumour suppressor genes could be used in the prevention, treatment and cure of cancer.	
Yr 13 - Summer 1	3.8.3 Using genome projects. 3.8.4.Gene technologies all the study and alteration of gene function allowing a	Genome, proteome and applications of this knowledge.	Sequencing methods are continuously updated.	Recall tasks Summaries Power Hour End of topic test Full paper 2 April.

	better understanding of organism function and the design of new industrial and medical processes. 3.8.4.1 Recombinant DNA technology	Methods for production of fragments. *In vitro* and *in vivo* amplification methods. Relate DNA technology to gene therapy. Balance the humanitarian aspects of recombinant DNA technology with the opposition from environmentalists and anti-globalisation activists. Interpret information relating to the use of recombinant DNA technology.	Evaluate the ethical, financial and social issues associated with the use and ownership of recombinant DNA technology in agriculture, in industry and in medicine.	Practical grade submission May 1st. Paper 3 questions.
		DNA probes and use in health care. Use of this information for genetic counseling and personalised medicine.		
	3.8.4.2 Differences in DNA between individuals of the same species can be exploited for identification and diagnosis of heritable conditions.	Explain the biological principles that underpin genetic fingerprinting techniques interpret data showing the results of gel electrophoresis to separate DNA fragments explain why scientists might use genetic fingerprinting in the fields of forensic science, medical diagnosis, animal and plant breeding.	Evaluate information relating to screening individuals for genetically determined conditions and drug responses.	

	3.8.4.3 Genetic fingerprinting. Revision: Key skills question types to focus and practice more.	Paper 3 questions. Paper 3 essay question. Comprehension questions. Longer answers questions. Data analysis tables and graphs. Data analysis conclusions and evaluations.		
Yr 13 - Summer 2				FINAL EXAMS 3 x 2hr papers. Usually the last 3 weeks of exam period.

5. Assessment Strategy

Assessment Type	Purpose	Frequency
Diagnostic	Check learning, check misconception, gaps in knowledge.	Every lesson throughout. Before a new topic.
Formative	During lesson - gaps in learning.	Every lesson: Plenary, summaries, retrieval
Summative	End of unit/term demonstrates knowledge & skills to date.	Every week: power hour questions, summaries, other HWk tasks. Termly or less: End of topic test/learning to date tests.

Synoptic	The whole subject.	End of year exams and full mock exams. Retrieval tasks during lessons.