

Curriculum Implementation Mapping

To implement a seamless route of the delivery of the science provision, we approach Science as a 5 year curriculum from Year 7 to 11.

From year 7 to year 11, the curriculum has been mapped according to three Big Ideas for each subject. This shows how topics are interlinked and how they spiral throughout the programme of study. The Big Ideas are captured below:

Biology	Chemistry	Physics
Cells and cellular processes	Materials and their properties	Energy
Biological systems for life	Chemical Changes	Forces and fields
Organisms and their interactions with the environment	Our earth and its atmosphere	Matter and materials

These Big Ideas run through each key stage. The strands running through each Big Idea are

1. Prior knowledge
2. Knowledge
3. Working Scientifically (scientific thinking, using scientific models, analysing and evaluating data, applications and implications of science and the collaborative approach to work of scientists)
4. Literacy & Communication (use of key terminology, effective scientific communication and discussion of misconceptions).
5. Numeracy
6. Assessment

In Year 7 and 8 students learn science using the Exploring Science (Pearson) platform. Year 7 has 7 hours and Year 8 has 6 hours per fortnight, in mixed ability classes.

In year 9 we begin to students continue their science learning using the Edexcel GCSE Pearson provision as a basis, and are taught in mixed ability sets. In year 9, students are taught 9 hours per fortnight; 3 hours per science subject.

In years 10 and 11 students are set based on ability and year half, and are taught 11 hours per fortnight; 4 hours each for Biology and Chemistry, 3 hours for Physics. Students will either study the Combined Science GCSE award or the Single Science GCSE award and we will work with the students to decide which option is best for them as they progress through years 10 and 11.

The three individual science subjects; Biology, Chemistry and Physics are taught, wherever possible, by subject specialists who, we feel, are best able to demonstrate a true depth of subject knowledge and who can enthuse students through a passion for their subject.

Sixth Form

There are A-levels in each of the three individual science subjects: Biology, Chemistry and Physics as well as a BTEC National Level 3 Extended Certificate in Applied Science with the following examination boards:

- Biology: AQA
- Chemistry: OCR Salters B
- Physics: OCR A
- BTEC Applied Science National Level 3: Pearson

Curriculum Implementation Mapping – Skills and Knowledge –Combined Science – Biology

Big ideas	Year 7	Year 8	Year 9	Year 10	Year 11
Cells and cellular processes	<i>Cells, tissues, organs and systems</i> 7Aa, 7Ab, 7Ac, 7Ad, 7Ae	<i>Unicellular organisms</i> 8Da, 8Db, 8Dc, 8Dd, 8De	SB1 Key Concepts in Biology (paper 1 & 2) SB1a-e, SB1g-i Spec: B1.1-B1.12, B1.15-B1.17 Core Prac: B1.6 SB1b Core Prac: B1.10 SB1h Core Prac: B1.16 SB1i	SB2 Cells and control (paper 1) SB2a-d, SB2g, SB2i Spec: B2.1-B2.9, B2.13, B2.14	
				SB3 Genetics (paper 1) SB3b, SB3ci, SB3ii, SB3g, SB3h, SB3j, SB3k Spec: B3.3-B3.6, B3.12-B3.16, B3.19-B3.23	
Biological systems for life	<i>Sexual reproduction in animals</i> 7Ba, 7Bb, 7Bc, 7Bd, 7Be	<i>Food and nutrition</i> 8Aa, 8Ab, 8Ac, 8Ad, 8Ae	SB6 Plant Structures and Their Functions (paper 2) SB6a-d Spec: B6.1-B6.10, B6.12, B6.13 Core Prac: B6.5 SB6b		SB5 Health, Disease and the Development of Medicines (paper 1) SB5a-SB5e, SB5i-SB5k Spec: B5.1-B5.6, B5.8, B5.12-B5.14, B5.16, B5.20, B5.23-B5.25
	<i>Muscles and bones</i> 7Ca, 7Cb, 7Cc, 7Cd, 7Ce				
Organisms and their interactions with the environment	<i>Ecosystems</i> 7Da, 7Db, 7Dc, 7Dd, 7De	<i>Plants and their reproduction</i> 8Ba, 8Bb, 8Bc, 8Bd, 8Be	SB8 Exchange and Transport in Animals (paper 2) SB8a, SB8c-SB8e Spec: B8.1-B8.3, B8.6-B8.12 Core Prac: B8.11 SB8e	SB9 Ecosystems and material cycles (paper 2) SB9a, SB9c, SB9d, SB9f, SB9g, SB9h, SB9j, SB9k, SB9l Spec: B9.1-B9.6, B9.9, B9.10, B9.12-B9.15 Core Prac: B9.5 SB9c	
		<i>Breathing and respiration</i> 8Ca, 8Cb, 8Cc, 8Cd, 8Ce			

Curriculum Implementation Mapping – Skills and Knowledge – Single Science – Biology

Big ideas	Year 7	Year 8	Year 9	Year 10	Year 11
Cells and cellular processes	<i>Cells, tissues, organs and systems</i> <i>7Aa, 7Ab, 7Ac, 7Ad, 7Ae</i>	<i>Unicellular organisms</i> <i>8Da, 8Db, 8Dc, 8Dd, 8De</i>	SB1 Key Concepts in Biology (paper 1 & 2) SB1a-e, SB1g-i Spec: B1.1-B1.12, B1.15-B1.17 Core Prac: B1.6 SB1b Core Prac: B1.10 SB1h Core Prac: B1.16 SB1i	SB2 Cells and control (paper 1) SB2a-SB2i Spec: B2.1-B2.14 <i>Triple Spec Points: B2.10B, B2.11B, B2.12B, B2.15B, B2.16B, B2.17B</i>	SB1 Key Concepts in Biology (paper 1 & 2) SB1f Triple Spec: B1.13B, B1.14B Core Prac: B1.13B SB1f
				SB3 Genetics (paper 1) SB3a-SB3k Spec: B3.3-B3.6, B3.12-B3.16, B3.19-B3.23 <i>Triple Spec Points: B3.1B, B3.2B, B3.7B, B3.8B, B3.9B, B3.10B, B3.11B, B3.17B, B3.18B</i>	
Biological systems for life	<i>Sexual reproduction in animals</i> <i>7Ba, 7Bb, 7Bc, 7Bd, 7Be</i> <i>Muscles and bones</i> <i>7Ca, 7Cb 7Cb, 7Cd, 7Ce</i>	<i>Food and nutrition</i> <i>8Aa, 8Ab, 8Ac, 8Ad, 8Ae</i>	SB6 Plant Structures and Their Functions (paper 2) SB6a-d Spec: B6.1-B6.10, B6.12, B6.13 Core Prac: B6.5 SB6b		SB5 Health, Disease and the Development of Medicines (paper 1) SB5a-SB5e, SB5i-SB5k Spec: B5.1-B5.6, B5.8, B5.12-B5.14, B5.16, B5.20, B5.23-B5.25
			SB7 Animal Coordination, Control and Homeostasis (paper 2) SB7a-f Spec: B7.1-B7.9, B7.13-B7.17		SB6 Plant Structures and Their Functions (paper 2) SB6e, SB6f, SB6g Triple Spec: B6.11B, B6.14B, B6.15B, B6.16B
					SB7 Animal Coordination, Control and Homeostasis (paper 2) SB7g, SB7h, SB7i Triple Spec: B7.10B, B7.11B, B7.12Ba,b,c
Organisms and their interactions with the environment	<i>Ecosystems</i> <i>7Da, 7Db, 7Dc, 7Dd, 7De</i>	<i>Plants and their reproduction</i> <i>8Ba, 8Bb, 8Bc, 8Bd, 8Be</i>	SB8 Exchange and Transport in Animals (paper 2) SB8a, SB8c-SB8e Spec: B8.1-B8.3, B8.6-B8.12 Core Prac: B8.11 SB8e	SB9 Ecosystems and material cycles (paper 2) SB9a-SB9m Spec: B9.1-B9.6, B9.9, B9.10, B9.12-B9.15 Core Prac: B9.5 SB9c <i>Triple Spec Points: B9.7B, B9.8B, B9.16B, B9.11B, B9.17B, B9.18B, B9.19B</i>	SB8 Exchange and Transport in Animals (paper 2) SB8b Triple Spec: B8.4B, B8.5B
		<i>Breathing and respiration</i> <i>8Ca, 8Cb, 8Cc, 8Cd, 8Ce</i>			

Topic	Year 7 Introduction to Science	7A Cells, Tissues, Organs and Systems	7B Sexual Reproduction in Animals	7C Muscles & Bones	7D Ecosystems
Prior KS2 knowledge	<ul style="list-style-type: none"> Apply presentation standards to written work use results from experiments as evidence Drawing and analysing scatter diagrams and bar charts Identification and use of basic scientific equipment Application of basic health safety and laboratory rules 	<ul style="list-style-type: none"> Identify and describe simple functions of plant structures, the digestive system, animal life cycles, plant and animal reproduction, the circulatory system use results from experiments as evidence 	<ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals and describe the changes as humans develop to old age understand the concept of the cell and that some cells are specialised. 	<ul style="list-style-type: none"> identify the major organ systems of humans state that some animals have skeletons and muscles, giving reasons for this describe the relationship between cells, tissues, organs and organ systems, name the major organs/systems and their functions and how cells within them are adapted. recall respiration as a life process 	<ul style="list-style-type: none"> describe why all organisms need a habitat describe how living things are classified into groups according to common characteristics recall that plants need light to make food by photosynthesis (7A), describe how organisms need a male and a female for sexual reproduction (7B) describe how energy is released by respiration (7A, 7C).
Knowledge	<ul style="list-style-type: none"> Fundamentals of laboratory safety use of basic scientific equipment to obtain results Graphical analysis of data and drawing graphs Basics of scientific variables and 	<ul style="list-style-type: none"> Use of light microscope to identify key features of cells Develop understanding of functions of cell structures Recognise cells as the fundamental unit of living organisms and identify the similarities and differences between plant and animal cells links between cells, tissues, organs, organ systems and organisms. 	<ul style="list-style-type: none"> Understanding reproduction in humans, including the structure and function of the reproductive systems, menstrual cycle, gametes, fertilisation, gestation and birth Describe the effect of maternal lifestyle on the foetus 	<ul style="list-style-type: none"> the structure and functions of the gas exchange system including the mechanism of breathing the structure and functions of the human skeleton and the function of muscles the impact of exercise, asthma and smoking and drugs on behaviour, health and life processes 	<ul style="list-style-type: none"> Understand the interdependence of organisms in an ecosystem and how organisms affect, and are affected by, their environment Recognise that variation can be continuous or discontinuous between species and within species understand that variation drives natural selection and the importance of maintaining biodiversity

	experimental design				
Working Scientifically (WS) Literacy & Communication (L&C) Maths (M)	<p>WS: Use of appropriate techniques and, apparatus during laboratory work</p> <p>WS: Application of laboratory health and safety rules</p> <p>L&C: experimental conclusion/evaluation</p> <p>M: graphical display of data, basic data analysis</p>	<p>WS: Use appropriate techniques, apparatus during laboratory work,</p> <p>WS: Safe use of microscope</p> <p>L&C: use conventions in writing</p> <p>M: use symbols for units</p>	<p>WS: Understand that scientific methods and theories develop based on evidence, make predictions, test predictions and identify independent, dependent and control variables</p> <p>L&C: making effective notes from text</p> <p>M: an understanding of number, size and scale and the quantitative relationship between units using estimations and explaining when they should be used.</p>	<p>WS: Understand that scientific methods and theories develop based on new evidence that is gathered and ask questions and develop a line of enquiry based on observations</p> <p>L&C: recall that information can be presented in different ways to communicate scientific ideas clearly.</p>	<p>WS: Present observations and data using appropriate methods, including tables and graphs and use observations and data to draw conclusions.</p> <p>L&C: recall that information can be presented in different ways to communicate scientific ideas clearly.</p> <p>M: data can be presented in bar charts, scatter graphs and frequency diagrams.</p>
Personal Development Spiritual (S) Moral (M) Social (S) Cultural (Cu) Relationships (R) Health and Wellbeing (H&W) Careers (Ca)	<ul style="list-style-type: none"> ● S: Collaboration and teamwork skills (group practicals) ● H&W: Hazard symbols, working safely 	<p>7Aa - Life processes:</p> <ul style="list-style-type: none"> ● S: Reflect on the wonder of life processes. ● H&W: Discuss the importance of life processes in maintaining health. <p>7Ab - Organs:</p> <ul style="list-style-type: none"> ● Ca: Introduce careers related to anatomy and physiology. 	<p>7Ba - Animal sexual reproduction:</p> <ul style="list-style-type: none"> ● R: Explore the importance of reproduction and parenting in animals. ● H&W: Understand reproductive health and responsible behaviour. <p>7Bb - Reproductive organs:</p>	<p>7Ca - Muscles:</p> <ul style="list-style-type: none"> ● H&W: Learn about the importance of exercise for muscle health. <p>7Cb - Bones:</p> <ul style="list-style-type: none"> ● H&W: Discuss the importance of calcium and nutrition for bone health. <p>7Cc - Movement:</p>	<p>7Da - Variation:</p> <ul style="list-style-type: none"> ● Cu: Explore how biodiversity contributes to the richness of different cultures. <p>7Db - Adaptations:</p> <ul style="list-style-type: none"> ● S: Reflect on the amazing adaptations of organisms to their environments.

		<ul style="list-style-type: none"> ● H&W: Explore how understanding organs is vital for health. <p>7Ac - Tissues:</p> <ul style="list-style-type: none"> ● S: Appreciate the complexity of tissue structures. ● Ca: Discuss careers in histology and medical research. <p>7Ad - Cells:</p> <ul style="list-style-type: none"> ● Ca: Highlight careers in cell biology and research. ● H&W: Learn about cell health and its impact on overall wellbeing. <p>7Ae - Transplants:</p> <ul style="list-style-type: none"> ● H&W: Discuss the health benefits and ethical considerations of organ transplants. ● M: Debate the ethical implications of organ donation and transplantation. 	<ul style="list-style-type: none"> ● H&W: Learn about human reproductive organs and health. <p>7Bc - Becoming pregnant:</p> <ul style="list-style-type: none"> ● R: Discuss responsible behaviour and the importance of consent. ● H&W: Understand the process of pregnancy and prenatal care. <p>7Bd - Gestation and birth:</p> <ul style="list-style-type: none"> ● H&W: Learn about the stages of pregnancy and the birth process. <p>7Be - Growing up:</p> <ul style="list-style-type: none"> ● H&W: Discuss the physical and emotional changes during puberty 	<ul style="list-style-type: none"> ● H&W: Understand how physical activity impacts overall health. <p>7Cd - Joints:</p> <ul style="list-style-type: none"> ● H&W: Explore joint health and common disorders like arthritis. <p>7Ce - Effects of exercise:</p> <ul style="list-style-type: none"> ● H&W: Highlight the benefits of regular exercise on the body. 	<ul style="list-style-type: none"> ● Ca: Discuss careers in ecology and environmental science. <p>7Dc - Effects of the environment:</p> <ul style="list-style-type: none"> ● H&W: Understand how environmental factors affect living organisms. <p>7Dd - Effects on the environment:</p> <ul style="list-style-type: none"> ● M: Debate the ethical responsibilities of humans in protecting the environment. ● S: Collaborate on projects that address environmental conservation.
Assessment Pattern	Students sit a baseline test as a 35 mark assessment	7A and 7B are assessed together in one 35 mark assessment.		7C and 7D are assessed together in one 35 mark assessment.	

Subject: Biology Year group: 8

Topic	8A Food & Nutrition	8B Plants and Their Reproduction	8C Breathing and Respiration	8D Unicellular Organisms
-------	---------------------	----------------------------------	------------------------------	--------------------------

Prior knowledge	<ul style="list-style-type: none"> ● recognise the impact of diet, exercise, drugs and lifestyle on body function ● recall the main parts of the digestive system and describe how cells are adapted to function (7A) ● describe how substances are carried by the blood ● describe how animals depend on other animals and plants for food (7D) ● describe diffusion 	<ul style="list-style-type: none"> ● describe the life process of reproduction in some plants and animals ● describe plant cells, tissues, organs and organ systems ● photosynthesis, sexual reproduction in humans, respiration, inherited variation, interdependence, food as a store of energy 	<ul style="list-style-type: none"> ● recall how the human body is organised and describe how cells are adapted to functions ● recall that respiration and breathing are not the same and describe how certain drugs affect the body ● describe how the circulatory system carries food and oxygen around the body and describe diffusion and explain the concept of air pressure 	<ul style="list-style-type: none"> ● recall that microorganisms are tiny living things (Year 6). ● recall the seven life processes (7A) ● recall how the human body is organised and describe how cells are adapted to functions (7A, 7B, 7C) ● describe how organisms are interdependent in an ecosystem (7D) ● describe diffusion (7G).
Knowledge	<ul style="list-style-type: none"> ● content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed ● calculations of energy requirements in a healthy daily diet ● the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) ● the role of diffusion in the movement of materials in and between cells. 	<ul style="list-style-type: none"> ● plants carry out photosynthesis and how they gain raw materials they need ● reproduction in plants, including pollination, fertilisation and seed dispersal ● the interdependence of organisms in an ecosystem ● heredity as the process by which genetic information is transmitted from one generation to the next ● identifying continuous or discontinuous variation ● the importance of maintaining biodiversity 	<ul style="list-style-type: none"> ● the role of diffusion in organisms ● the structure and functions of the gas exchange system in humans and plants, including adaptations and the mechanism of breathing ● the impact of lifestyle on the human gas exchange system ● aerobic and anaerobic respiration in different living organisms and the differences between them 	<ul style="list-style-type: none"> ● cells as the fundamental unit of living organisms ● the dependence of all life on photosynthesis ● the similarities and differences between plant/animal cells ● the processes of aerobic and anaerobic respiration in organisms ● the process and function of diffusion ● the structural adaptations of some unicellular organisms ● the organisation of multicellular organisms: from cells to tissues to organs to systems to organisms
Working Scientifically (WS) Literacy & Communication (L&C) Maths (M)	<p>WS: apply mathematical concepts and calculate results. L&C: how verbs and adjectives can be used to add 'weight' to an opinion bias. M: use appropriate units for area measurements, calculate area for a variety of shapes, including rectangles and cuboids.</p>	<p>WS: make/record observations and measurements for different investigations; evaluate the reliability of methods and suggest improvements L&C: information can be presented in different ways to communicate ideas. M: use appropriate units to calculating area and use a sample to calculate population size.</p>	<p>WS: understand that scientific theories develop based on evidence and apply mathematical concepts to calculate results. L&C: present information in different ways to communicate scientific ideas clearly. M: identify/use ranges Identify anomalies calculate means and explain their use</p>	<p>WS: present observations and data using appropriate methods, including tables and graphs (pie charts). L&C: understanding how modal verbs are used to express certainty. M: identify pie charts and describe what they show as well as knowing when and how to use a pie chart</p>
AP	8A and 8C are assessed together in one 35 mark assessment.		8B and 8D are assessed together in one 35 mark assessment.	

Curriculum Implementation Mapping – Skills and Knowledge

Topic	8A Food & Nutrition	8C Breathing and Respiration	8B Plants and Their Reproduction	8D Unicellular Organisms
--------------	--------------------------------	-------------------------------------	---	---------------------------------

<p>Prior knowledge</p>	<ul style="list-style-type: none"> ● recognise the impact of diet, exercise, drugs and lifestyle on body function ● recall the main parts of the digestive system and describe how cells are adapted to function (7A) ● describe how substances are carried by the blood ● describe how animals depend on other animals and plants for food (7D) ● describe diffusion 	<ul style="list-style-type: none"> ● recall how the human body is organised and describe how cells are adapted to functions ● recall that respiration and breathing are not the same and describe how certain drugs affect the body ● describe how the circulatory system carries food and oxygen around the body and describe diffusion and explain the concept of air pressure 	<ul style="list-style-type: none"> ● describe the life process of reproduction in some plants and animals ● describe plant cells, tissues, organs and organ systems ● photosynthesis, sexual reproduction in humans, respiration, inherited variation, interdependence, food as a store of energy 	<ul style="list-style-type: none"> ● recall that microorganisms are tiny living things (Year 6). ● recall the seven life processes (7A) ● recall how the human body is organised and describe how cells are adapted to functions (7A, 7B, 7C) ● describe how organisms are interdependent in an ecosystem (7D) ● describe diffusion (7G).
<p>Knowledge</p>	<ul style="list-style-type: none"> ● content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed ● calculations of energy requirements in a healthy daily diet ● the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) ● the role of diffusion in the movement of materials in and between cells. 	<ul style="list-style-type: none"> ● the role of diffusion in organisms ● the structure and functions of the gas exchange system in humans and plants, including adaptations and the mechanism of breathing ● the impact of lifestyle on the human gas exchange system ● aerobic and anaerobic respiration in different living organisms and the differences between them 	<ul style="list-style-type: none"> ● plants carry out photosynthesis and how they gain raw materials they need ● reproduction in plants, including pollination, fertilisation and seed dispersal ● the interdependence of organisms in an ecosystem ● heredity as the process by which genetic information is transmitted from one generation to the next ● identifying continuous or discontinuous variation ● the importance of maintaining biodiversity 	<ul style="list-style-type: none"> ● cells as the fundamental unit of living organisms ● the dependence of all life on photosynthesis ● the similarities and differences between plant/animal cells ● the processes of aerobic and anaerobic respiration in organisms ● the process and function of diffusion ● the structural adaptations of some unicellular organisms ● the organisation of multicellular organisms: from cells to tissues to organs to systems to organisms
<p>Working Scientifically (WS) Literacy & Communication (L&C) Maths (M)</p>	<p>WS: apply mathematical concepts and calculate results. L&C: how verbs and adjectives can be used to add 'weight' to an opinion bias. M: use appropriate units for area measurements, calculate area for a variety of shapes, including rectangles and cuboids.</p>	<p>WS: understand that scientific theories develop based on evidence and apply mathematical concepts to calculate results. L&C: present information in different ways to communicate scientific ideas clearly. M: identify/use ranges Identify anomalies calculate means and explain their use</p>	<p>WS: make/record observations and measurements for different investigations; evaluate the reliability of methods and suggest improvements L&C: information can be presented in different ways to communicate ideas. M: use appropriate units to calculating area and use a sample to calculate population size.</p>	<p>WS: present observations and data using appropriate methods, including tables and graphs (pie charts). L&C: understanding how modal verbs are used to express certainty. M: identify pie charts and describe what they show as well as knowing when and how to use a pie chart</p>

<p>Personal Development Spiritual (S) Moral (M) Social (S) Cultural (Cu) Relationships (R) Health and Wellbeing (H&W) Careers (Ca)</p>	<p>8Aa - Nutrients:</p> <ul style="list-style-type: none"> ● H&W: Discuss the importance of balanced nutrition for health. <p>8Ab - Food tests:</p> <ul style="list-style-type: none"> ● Ca: Highlight careers in nutrition and dietetics. <p>8Ac - Unhealthy diet:</p> <ul style="list-style-type: none"> ● H&W: Explore the health impacts of poor diet and lifestyle choices. <p>8Ad - Digestive system:</p> <ul style="list-style-type: none"> ● H&W: Understand how the digestive system processes food for energy and health. <p>8Ae - Absorption:</p> <ul style="list-style-type: none"> ● H&W: Learn about nutrient absorption and its role in maintaining health. 	<p>8Ba - Plant reproduction:</p> <ul style="list-style-type: none"> ● R: Discuss the importance of plants in ecosystems and human life. <p>8Bb - Pollination:</p> <ul style="list-style-type: none"> ● Cu: Explore cultural practices related to plants and agriculture. <p>8Bc - Fertilisation:</p> <ul style="list-style-type: none"> ● H&W: Understand the role of fertilisation in plant reproduction and crop production. <p>8Bd - Seed dispersal:</p> <ul style="list-style-type: none"> ● S: Collaborate on projects to study local plant life and seed dispersal methods. <p>8Be - Germination:</p> <ul style="list-style-type: none"> ● S: Appreciate the process of germination and its significance in plant life cycles. 	<p>8Ca - Gas exchange:</p> <ul style="list-style-type: none"> ● H&W: Learn about the respiratory system and its role in maintaining health. <p>8Cb - Breathing:</p> <ul style="list-style-type: none"> ● H&W: Discuss the importance of clean air and the impact of pollution on respiratory health. <p>8Cc - Aerobic respiration:</p> <ul style="list-style-type: none"> ● H&W: Understand the process of aerobic respiration and its significance for energy production. <p>8Cd - Anaerobic respiration:</p> <ul style="list-style-type: none"> ● H&W: Explore the effects of anaerobic respiration during exercise. <p>8Ce - Comparing respiration:</p> <ul style="list-style-type: none"> ● Ca: Highlight careers in respiratory therapy and sports science. 	<p>8Da - Unicellular organisms:</p> <ul style="list-style-type: none"> ● S: Reflect on the diversity and importance of unicellular life forms. <p>8Db - Microscopic fungi:</p> <ul style="list-style-type: none"> ● Ca: Discuss careers in microbiology and biotechnology. <p>8Dc - Bacteria:</p> <ul style="list-style-type: none"> ● H&W: Understand the role of bacteria in health and disease. <p>8Dd - Protists:</p> <ul style="list-style-type: none"> ● Cu: Explore the significance of protists in various cultures and ecosystems. <p>8De - Useful microorganisms:</p> <ul style="list-style-type: none"> ● M: Debate the ethical implications of using microorganisms in biotechnology.
<p>AP</p>	<p>8A and 8C are assessed together in one 35 mark assessment.</p>		<p>8B and 8D are assessed together in one 35 mark assessment.</p>	

Subject: Biology

Year group: 9

<p>Topic</p>	<p>SB1 Key Concepts in Biology</p>	<p>SB6 Plant Structures and Their Functions</p>	<p>SB8 Exchange and Transport in Animals (CB8a-CB8d)</p>	
---------------------	---	--	---	--

Prior Knowledge	Describe the differences between animal, plant and bacterial cells and describe the structures found within them. Describe how some cells are specialised for certain functions. Describe the action of enzymes Describe diffusion	Describe the different tissues found in plants and explain how some are designed to suit a function Give an explanation of photosynthesis and the raw materials required. Describe diffusion	Recall how the human body is organised into systems Describe diffusion Describe the human gas exchange system Give a basic comparison of aerobic and anaerobic respiration	
Knowledge	<ul style="list-style-type: none"> ● Explain how the sub-cellular structures in Eukaryotic and Prokaryotic cells are related to their functions. ● Describe how cells are specialised to their function ● Explain the mechanism of enzyme action, the conditions that can affect enzyme activity and the process of denaturation ● Explain how substances can be transported into and out of cells 	<ul style="list-style-type: none"> ● Describe the photosynthesis reaction in plants and algae and explain the effect of temperature, light intensity and carbon dioxide concentration as limiting factors on rate ● Explain how plant structures are adapted to their functions ● Explain the role of transpiration and translocation in movement of substances around a plant and the conditions that affect them 	<ul style="list-style-type: none"> ● Describe the substances that animals need to exchange with their environment ● Explain how animals are adapted for gas exchange and transfer of substances around their bodies via a circulatory system ● Explain the structure of the heart is linked to its function ● Calculate heart rate/stroke volume/cardiac output ● Compare aerobic and anaerobic respiration 	<ul style="list-style-type: none"> ●
Disciplinary	Method writing Tabulating Conclusions Variables Analysis			
Literacy	Reading Comprehension Tier 3 keywords Dual coding Extended Writing	Reading Comprehension Tier 3 keywords Etymology Dual coding Extended Writing		
Numeracy	1a-d/2a-c,f,h/4a,c	1a,c/2b,c,d,f,g/3a/4a,b,c,d	1a,b,c/2a,c,f,h/3a/4a,c/5c	

Personal Development	Career Links	Career Links	Career Links	Career Links
Assessment Pattern	25 mark test mid topic and 40 mark end of topic test	40 mark end of topic test	40 mark end of topic test	
	50 mark end of year test			

Curriculum Implementation Mapping – Skills and Knowledge

Subject: Biology

Year group: 10

Topic	SB9 Ecosystems and Material Cycles	SB7 Animal Hormones, Coordination and Homeostasis	SB2 Cells and Control	SB3 Genetics	SB4 Natural Selection and Genetic Modification
Prior Knowledge	Understand the interdependence of organisms in an ecosystem and how organisms affect, and are affected by, their environment	Describe how substances are transported by the blood Understand reproduction in humans and give a description of the stages of the menstrual cycle Describe how cells are specialised for certain functions	Recognise cells as the fundamental unit of living organisms and identify the similarities and differences between plant and animal cells Links between cells, tissues, organs, organ systems and organisms.	Recognise cells as the fundamental unit of living organisms and identify the similarities and differences between plant and animal cells Links between cells, tissues, organs, organ systems and organisms.	Recognise heredity as the process by which genetic information is transmitted from one generation to the next
Knowledge	<ul style="list-style-type: none"> Describe the levels of organisation in ecosystems and explain how abiotic and biotic factors affect communities Describe how organisms are dependent on each other Explain how to estimate sizes of populations and explain how humans impact on biodiversity 	<ul style="list-style-type: none"> Describe the glands of the endocrine system, the hormones they produce, the target cells they work on and the effect they have. Describe the stages of the menstrual cycle and the four hormones that regulate the menstrual cycle. 	<ul style="list-style-type: none"> Describe the stages of mitosis, explain its importance to organisms and describe the outcomes of mitosis Describe organism growth, the importance of specialisation of cells and interpret percentile growth charts Describe the function of stem cells and discuss the benefits and risks associated with their use 	<ul style="list-style-type: none"> Explain the role of meiosis and the characteristics of the cells it produces Describe the structure of DNA and explain the process of extracting DNA Explain where genetic differences arise and use the correct terminology to describe genetic characteristics 	<ul style="list-style-type: none"> Explain Darwins theory of evolution, the evidence for human evolution and how resistant bacteria support the theory Describe the differences between 3 domain classification and 5 kingdom classification Explain selective breeding

	<ul style="list-style-type: none"> ● Explain the benefits of maintaining biodiversity ● Describe the importance of material cycles. Explain the importance of the water, carbon and nitrogen cycles ● Explain energy transfer between trophic levels in a food web ● Describe factors affect food security ● Evaluate the use of indicator species as evidence to assess water quality ● Explain how rates of decomposition can be altered in food preservation and composting 	<ul style="list-style-type: none"> ● Explain how contraception can be used to stop pregnancy and how ARTs are designed to increase chances of pregnancy ● Explain how blood sugar levels are regulated and how Type I and Type II diabetes are treated. 	<ul style="list-style-type: none"> ● Explain the structure and function of the central nervous system and the role of neurotransmitters in impulse transmission ● Describe the structure and function of the parts of the brain and explain how brain injuries can be assessed and treated ● Explain the structure and function of the eye and describe defects of the eye and explain their impact 	<ul style="list-style-type: none"> ● Use genetic diagrams to explain monohybrid inheritance of a gene and sex determination ● Describe the causes of variation ● Discuss the outcomes of the human genome project and describe how mutations arise and their impacts ● Explain the adv/disadvantages of asexual reproduction ● Describe protein synthesis & how DNA decides order of amino acids ● Describe the work of Mendel ● Understand the terms codominance and multiple alleles and explain how sex-linked disorders are inherited 	<ul style="list-style-type: none"> ● Describe the process of genetic engineering and evaluate the benefits and risks ● Describe how the anatomy of the pentadactyl limb provides evidence for evolution ● Explain the advantages/disadvantages of producing GM organisms ● Explain the advantages/disadvantages of fertiliser use and biological control
Maths Skills		1a,c/2c,d,e/3a/4a,c	1c,d/2g/4a,c	1c/2c,e/4a	1a,b,c/2c/4a,c
Assessment Pattern	25 mark mid topic test 40 mark end of topic test	40 mark end of topic test	40 mark end of topic test	40 mark end of topic test	40 mark end of topic test
	50 mark end of year test				

Curriculum Implementation Mapping – Skills and Knowledge

Subject: Biology

Year group: 11

Topic	SB5 Health Disease and the Development of Medicines	SB1 Key Concepts in Biology	SB6 Plant Structures and Their Functions	SB7 Animal Hormones, Coordination and Homeostasis	SB8 Exchange and Transport in Animals
Prior Knowledge	Recognise how cells are specialised for specific roles within the body. Recognise differences between eukaryotic and prokaryotic cells Describe how lifestyle can impact upon cellular and bodily function	Recognise that organisms need specific nutrients in order to function and explain the function of those nutrients within the body.	Understand the adaptations of plant tissues to carry out specific functions within a plant. Explain how a plant exchanges substances with its environment	Understand how the circulatory system transports substances around the body. Understand how organ systems work together within an organism	Describe diffusion and its importance to organisms. Explain the relationship between surface area and volume

		Explain the role of enzymes in digestion and synthesis of biological molecules			Describe the conditions that enable efficient gas exchange
Knowledge	<ul style="list-style-type: none"> ● Give a complete definition of health and describe the difference between communicable/non-communicable diseases ● Describe how pathogens cause diseases and the methods by which they can be spread ● Describe the barriers to disease in humans and explain the role of the immune system in defence against disease ● Explain the response to immunisation ● Explain how antibiotics are used and how new medicines are developed ● Describe and explain how factors can impact on non-communicable diseases ● Describe the life cycle of a virus within a cell ● Explain the use of aseptic techniques ● Describe how plants defend themselves against diseases and how diseases can be detected in plants ● Describe and explain the production and use of monoclonal antibodies 	<ul style="list-style-type: none"> ● Investigate and explain the use of chemical reagents to identify starch, reducing sugars, proteins and fats ● Explain how energy contained in food can be measured using calorimetry 	<ul style="list-style-type: none"> ● Explain how the structure of a leaf is adapted for photosynthesis and gas exchange ● Explain how plants are adapted to survive in extreme environments ● Explain how plant hormones control and coordinate plant growth and describe commercial uses of plant hormones 	<ul style="list-style-type: none"> ● Explain the importance of homeostasis including thermoregulation and osmoregulation and explain how these conditions are regulated ● Describe the structure of the urinary system, explain how the structure of the nephron relates to its function ● Explain the effect of ADH ● Describe treatments for kidney failure 	<ul style="list-style-type: none"> ● Describe the factors affecting the rate of diffusion ● Calculate the rate of diffusion using fick's law
Maths Skills	1a,c,d/2c,d,g/4a,c/5c	1a/2a	2d/a,c/5a,c		1a/3a,d
Assessment Pattern	25 mark mid topic test 40 mark end of topic test	SB1/SB6 40 mark test on triple content		SB7/SB8 40 mark test on triple content	
2 x mock exams + GCSE summer examinations					

Mathematical skills

Details of the mathematical skills in other science subjects are given for reference.

1	Arithmetic and Numerical Computation
a	Recognise and use expressions in decimal form

b	Recognise and use expressions in standard form
c	Use ratios, fractions and percentages
d	Make estimates of the results of simple calculations
2	Handling Data
a	Use an appropriate number of significant figures
b	Find arithmetic means
c	Construct and interpret frequency tables and diagrams, bar charts and histograms
d	Understand the principles of sampling as applied to scientific data
e	Understand simple probability
f	Understand the terms mean, mode and median
g	Use a scatter diagram to identify a correlation between two variables
h	Make order of magnitude calculations
3	Algebra
a	Understand and use the symbols: =, <, <<, >>, >, \propto , ~
b	Change the subject of an equation
c	Substitute numerical values into algebraic equations using appropriate units for physical quantities
d	Solve simple algebraic equations
4	Graphs
a	Translate information between graphical and numeric form
b	Understand that $y = mx + c$ represents a linear relationship

c	Plot two variables from experimental or other data
d	Determine the slope and intercept of a linear graph
e	Draw and use the slope of a tangent to a curve as a measure of rate of change
f	Understand the physical significance of area between a curve and the x-axis and measure it by counting squares as appropriate
5	Geometry and Trigonometry
a	Use angular measures in degrees
b	Visualise and represent 2D and 3D forms, including two dimensional representations of 3D objects
c	Calculate areas of triangles and rectangles, surface areas and volumes of cubes

Working Scientifically

The GCSE in Chemistry requires students to develop the skills, knowledge and understanding of working scientifically. Working scientifically will be assessed through examination and the completion of the core practical tasks.

1 Development of scientific thinking

- a Understand how scientific methods and theories develop over time.
- b Use a variety of models, such as representational, spatial, descriptive, computational and mathematical, to solve problems, make predictions and to develop scientific explanations and an understanding of familiar and unfamiliar facts.
- c Appreciate the power and limitations of science, and consider any ethical issues that may arise.
- d Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.
- e Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences.
- f Recognise the importance of peer review of results and of communicating results to a range of audiences.

2 Experimental skills and strategies

- a Use scientific theories and explanations to develop hypotheses.
- b Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.
- c Apply a knowledge of a range of techniques, instruments, apparatus and materials to select those appropriate to the experiment.
- d Carry out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.
- e Recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative.
- f Make and record observations and measurements using a range of apparatus and methods.
- g Evaluate methods and suggest possible improvements and further investigations.

3 Analysis and evaluation

- Apply the cycle of collecting, presenting and analysing data, including:
- a presenting observations and other data using appropriate methods.
 - b translating data from one form to another.
 - c carrying out and representing mathematical and statistical analysis.
 - d representing distributions of results and making estimations of uncertainty.
 - e interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions.
 - f presenting reasoned explanations, including relating data to hypotheses.
 - g being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error.
 - h communicating the scientific rationale for investigations, methods used, findings and reasoned conclusions through paper-based and electronic reports and presentations using verbal, diagrammatic, graphical, numerical and symbolic forms.

4 Scientific vocabulary, quantities, units, symbols and nomenclature

- a Use scientific vocabulary, terminology and definitions.
- b Recognise the importance of scientific quantities and understand how they are determined.
- c Use SI units (e.g. kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate.
- d Use prefixes and powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano).
- e Interconvert units.
- f Use an appropriate number of significant figures in calculation.

Working scientifically skill areas 1 and 4 will be developed throughout the course and integrated with content. Skill areas 2 and 3 will be developed through teaching of core practical tasks. The details of provision for skill areas 2 and 3 are evidenced within the core practical task schemes of learning. **Scientific literacy** is subsumed within working scientifically. Schemes of Learning are detailed with key terminology and support the development of effective scientific communication.

Subject: Biology

Year Group: 12

Topic	Biological Molecules	Cells	Organisms exchange substances with their environment	Genetic information, variation and relationships	Energy transfer in and between organisms
Prior Knowledge	<ul style="list-style-type: none"> • Products of photosynthesis • Reactants in aerobic respiration • Uses of glucose in plants and algae • Basic structure of protein molecules • Role of proteins in tissues • Enzymes as biological catalysts • Enzyme specificity/action 	<ul style="list-style-type: none"> • Subcellular structures in plants, animals and bacteria • Mitosis and location of chromosomes • Diffusion, osmosis and active transport • Pathogens • The immune system and production of antibodies • Immunisation 	<ul style="list-style-type: none"> • Efficient gas exchange • Adaptations of the lungs and digestive system • Mechanism of breathing • Gas exchange in plants • Xylem and phloem • Heart and circulatory system • Components of the blood • Haemoglobin 	<ul style="list-style-type: none"> • Aseptic technique • Meiosis • Sexual reproduction • DNA and genes • Protein synthesis • Alleles • Sampling 	<ul style="list-style-type: none"> • Photosynthesis • Role of chlorophyll • Limiting factors in photosynthesis • Aerobic and anaerobic respiration • The sun as a source of energy • Energy and biomass transfer in food chains • Nutrient cycles
Knowledge	<p>3.1.1: molar solutions, bonding, polymerisation, condensation and hydrolysis, metabolism</p> <p>3.1.2: carbohydrates - relating structure to function, tests for reducing/non-reducing sugars/starch</p> <p>3.1.3 triglycerides - structure and function, phospholipids - structure and function, test for lipids</p> <p>3.1.4.1 amino acids, polypeptide structure, protein structure, test for proteins</p> <p>3.1.4.2 enzyme structure and function, enzyme action, rate of enzyme reactions, pH/temperature/substrate concentration effect on enzymes, enzyme inhibition</p> <p>3.1.5.1 nucleotide, RNA, DNA structure</p> <p>3.1.5.2 Semi conservative DNA replication</p> <p>3.1.6 energy, ATP, ATP synthesis</p> <p>3.1.7 structure, properties and importance of water, inorganic ions</p>	<p>3.2.1.3 magnification, fractionation, centrifugation, scanning and transmission electron microscopes, use of graticules, calculating specimen sizes</p> <p>3.2.1.1 subcellular structures + functions in animal and plant cells</p> <p>3.2.1.1 cell differentiation, cell organisation</p> <p>3.2.1.2 structure of prokaryotic cells</p> <p>3.2.2 Mitosis, DNA replication, the cell cycle, cancer and the cell cycle</p> <p>3.2.3 cell surface membrane structure, components of cell surface membrane, fluid mosaic model, diffusion, facilitated diffusion, osmosis, water potential, active transport, villi and microvilli, digestion in the ileum</p> <p>3.2.4 defence mechanisms, distinguishing foreign cells, phagocytosis, antigens, cell</p>	<p>3.3.1 surface area:volume ratio, adaptations for exchange</p> <p>3.3.2 exchange in unicellular organisms & insects, structure of gills, countercurrent flow, plant gas exchange + adaptations, conserving water, human gas exchange system + functions, mechanism of breathing, features of gas exchange surfaces</p> <p>3.3.3 structure + function of the ileum, absorption of biological molecules</p> <p>3.3.4.1 haemoglobin structure and function, oxygen dissociation, features of transport systems in an array of organisms, heart structure and function, cardiac cycle, structure and function of blood vessels</p> <p>3.3.4.2 transpiration, xylem and phloem, mass flow mechanism, investigating transport in plants,</p>	<p>3.4.1 genes and polypeptides, DNA in prokaryotes and eukaryotes, chromosome structure, alleles, features of genetic code, structure of RNA, mRNA, tRNA</p> <p>3.4.2 transcription and splicing, translation and the roles of mRNA and tRNA</p> <p>3.4.3 mutations and their effects, meiosis and genetic variation</p> <p>3.4.4 explaining variation, allele frequency in the gene pool, natural selection, selection pressures</p> <p>3.4.5 concept of a species, classification and evolution</p> <p>3.8.2.1 species diversity, diversity indices</p> <p>3.4.6 impact of agriculture</p> <p>3.4.7 comparing genetic diversity</p> <p>3.8.3 measuring variation, sampling techniques, causes of</p>	<p>3.5.1 photosynthesis, plant adaptations, oxidation and reduction, light dependent reaction, chloroplast adaptations, Calvin cycle</p> <p>3.5.2 glycolysis, link reaction, krebs cycle, oxidative phosphorylation, ATP synthesis, aerobic respiration, ethanol and lactate production</p> <p>3.5.3 energy transfers through ecosystems, % energy transfer, energy loss, GPP + NPP</p> <p>3.5.4 nutrient cycles, phosphorus cycle, nitrogen cycle, type and use of fertilisers, eutrophication,</p>

		mediated immunity, humoral immunity, secondary immune response, antigenic variation, antibodies, monoclonal antibodies, vaccination programmes, HIV link to AIDS, ELISA tests, treatment		variation, mean and standard deviation	
Maths Skills Apparatus & techniques Practical skills	0.3, 0.5, 3.2, 3.6, AT c, AT f, AT g 2.4, 3.3	0.3, 1.8, 3.2, 3.4 AT d, AT e, AT f,	2.2, 4.1 AT b, AT d, AT h, AT j 1.1	0.5, 1.2, 1.10, 2.3, 2.5, AT d, AT i, AT k,	0.1, 0.3, 2.4 AT a, AT b, AT g, AT i, 1.1
Assessment pattern	September Assessment (Mid topic – 46 marks) 50 mark Enzymes and Nucleic acids test (End of chapter 1 and chapter 2)	50 mark Cell structure test (Chapter 3) 50 mark Transport across cell membranes test (Chapter 4) 50 mark Cell recognition and the immune system test (Chapter 5)	50 mark Organisms Exchange with Their Environment test (Chapter 6) 50 mark Mass transport test (Chapter 7)	50 mark DNA, Genetic diversity and Biodiversity test (Chapter 8, 9 & 10)	50 mark Energy and ecosystems (Chapter 13) assessed with Chapter 19
	End of year exam (91 marks)				

Curriculum Implementation Mapping – Skills and Knowledge

Subject: Biology

Year Group: 13

Topic	Energy transfer in and between organisms	Organisms respond to changes in their environment	Genetics, populations, evolution and ecosystems	The control of gene expression
Prior Knowledge	<ul style="list-style-type: none"> ● Photosynthesis ● Role of chlorophyll ● Limiting factors in photosynthesis ● Aerobic and anaerobic respiration ● The sun as a source of energy ● Energy and biomass transfer in food chains ● Nutrient cycles 	<ul style="list-style-type: none"> ● The nervous systems ● Reflex arcs ● Hormones ● Tropisms in plants ● The role of the kidneys ● Control of blood glucose ● Diabetes 	<ul style="list-style-type: none"> ● Outcomes of meiosis ● Fertilisation ● Sex determination ● Alleles and monohybrid inheritance ● Dominant and recessive alleles ● DNA and genes ● Pedigree charts and punnett squares ● Evolution by Natural selection ● Sampling techniques 	<ul style="list-style-type: none"> ● Control of characteristics ● Genetic and environmental variation ● Darwin and Lamark ● Genetic engineering ● DNA Fingerprinting ● Recombinant organisms ● Ethics of genetic engineering
Knowledge	3.5.1 photosynthesis, plant adaptations, oxidation and reduction, light dependent	3.6.1.1 stimulus and response, taxes, kinesis and tropisms, reflex arcs. neurones,	3.7.1 genotypes and phenotypes, multiple alleles, monohybrid inheritance, genetic	3.8.1 types and impacts of mutations

	<p>reaction, chloroplast adaptations, Calvin cycle</p> <p>3.5.2 glycolysis, link reaction, krebs cycle, oxidative phosphorylation, ATP synthesis, aerobic respiration, ethanol and lactate production</p> <p>3.5.3 energy transfers through ecosystems, % energy transfer, energy loss, GPP + NPP</p> <p>3.5.4 nutrient cycles, phosphorus cycle, nitrogen cycle, type and use of fertilisers, eutrophication,</p>	<p>3.6.1.2 sensory receptors, pacinian corpuscle, the eye</p> <p>3.6.1.3 autonomic nervous system, control of heart rate, chemical and pressure receptors</p> <p>3.6.2.1 nervous and chemical coordination, structure of neurons</p> <p>3.6.2.1 resting potential, passage of an action potential, synapses, neurotransmission</p> <p>3.6.3 gross muscle structure, myofibril structure, sliding filament theory</p> <p>3.6.4.1 homeostasis, control mechanisms, coordination, negative feedback. positive feedback</p> <p>3.6.4.2 hormonal control, diabetes, diabetes</p> <p>3.6.4.3 kidney structure, nephron structure, ultrafiltration, osmoregulation ,</p>	<p>diagrams, dihybrid inheritance, codominance, blood groups, sex-linkage, sex determination, autosomal linkage, epistasis, chi-squared testing</p> <p>3.7.2 hardy-weinberg principle, genetic variation, environmental variation</p> <p>3.7.3 genel pools, natural selection, types of selection, speciation</p> <p>3.7.4 biotic and abiotic factors, ecosystems, niches, population dynamics, inter- and intraspecific competition, predator-prey relationships, using quadrats, using transects, measuring abundance, mark-release-recapture, succession, conservation</p>	<p>3.8.2.1 totipotency, pluripotency, cell differentiation, cell specialisation, oestrogen and gene transcription</p> <p>3.8.2.2 siRNA, gene expression, epigenetics, epigenome, acetylation and methylation of histones and DNA</p> <p>3.8.2.3 benign and malignant tumors, oncogenes, oestrogen and breast cancer</p> <p>3.8.3 genome sequencing, determining genomes and proteomes</p> <p>3.8.4.1 cDNA and reverse transcriptase, sticky ends, vectors, gene markers, polymerase chain reaction</p> <p>3.8.4.2 DNA probes, DNA hybridisation, genetic screening, genetic counselling</p> <p>3.8.4.3 genetic fingerprinting, gel electrophoresis</p>
<p>Maths Skills</p> <p>Apparatus & techniques</p> <p>Practical skills</p>	<p>0.1, 0.3, 2.4</p> <p>AT a, AT b, AT g, AT i, 1.1</p>	<p>0.2, 2.2</p> <p>AT b, AT c, AT d, AT h,</p>	<p>0.3, 1.4, 1.5, 1.9, 2.4, 2.5</p> <p>AT a, AT h, AT i, AT k, AT l 1.2</p>	<p>AT g, AT i</p>
<p>Assessment pattern</p>	<p>50 mark Photosynthesis & Respiration test (Chapter 11 & 12)</p> <p>Energy and ecosystems (Chapter 13) assessed with Chapter 19 at the end of year 12 in a 50 mark paper</p>	<p>50 mark Response to stimuli test (Chapter 14)</p> <p>50 mark Nervous coordination and muscles test (Chapter 15)</p> <p>50 mark Homeostasis test (Chapter 16)</p>	<p>50 mark Inherited change test (Chapter 17)</p> <p>50 mark Populations and evolution test (Chapter 18)</p> <p>Populations in ecosystems (Chapter 19) assessed with Chapter 13 at the end of year 12 in a 50 mark paper</p>	<p>50 mark Gene expression & recombinant DNA technology test (Chapter 20 & 21)</p>
<p>Start of year: AS Paper (75 marks)</p> <p>End of year exams (3 papers: 91/91/72 marks)</p>				