Science Department – Year 12 Biology

	A level Biology is a stepping stone to future study. We have chosen a course that allows students to develop the skills that they will need in future studies. The course allows us to support and inspire of students to nurture a passion for Biology and lay the groundwork for further study in courses like biological sciences, medicine and other science related courses. AQA Biology A-level gives students the skills to make connections and associations with all living things around us. Being such a broad topic, it aims to encourage students to find a specific area of interest, plus it opens the door to a fantastic range of interesting careers.							
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2		
Shirley High Curriculum Map	Teacher A(4 lessons a fortnight). Section 2- Cells Topic 3- Cell structure 3.1-3.8 Teacher B(6 lessons a fortnight. Section 1- Biological molecules Topic 1. Biological molecules 1.1-1.6	Teacher A(4 lessons a fortnight) Section 2-Cells Preparing stained squashes of root cells to observe mitosis Section 2 Topic 4. Transport 4.1-4.3 Core practical 4. Effect of a named variable on the permeability of cell -surface membrane. Teacher B(6 lessons a fortnight. Section 1. Biological molecules 1.6-1.9 Core Pract.1. Investigation into the effect of a named variable on enzyme-controlled reaction.	Teacher A(4 lessons a fortnight) Section 2-Cells Topic 4. Transport across cell membranes. 4.4-4.5 Core Practical 3: Practical 3 Dilution series to find water potential of plant tissues Topic 5. Cell recognition and immune system, 5.1-5.3 Teacher B(6 lessons a fortnight. Section 1- Biological molecules. Topic 2- Nucleic acid 2.2-2.4. Section 3 – Organisms exchange substances with their environment Topic 6 Exchange 6.1-6.4	 Teacher A(4 lessons a fortnight). Section 2- Cells Topic 5. Cell recognition and immune system, 5.4-5.7. Section 4; genetic information, variation and relationship. Topic 8. Genetic information, variation and Relationships between organisms 8.1-8.2. Teacher B(6 lessons a fortnight. Section 3 – Organisms exchange substances with their environment Topic 6 Exchange 6.5-6.9 Topic 7: Mass Transport. 7.1-7.2 	Teacher A(4 lessons a fortnight). Section 4; genetic information, variation and relationship. • Topic 8. Genetic information • 8.3-8.5 • Topic 9 . Genetic diversity • 9.1-9.2 Teacher B(6 lessons a fortnight. Section 3 – Organisms exchange substances with their environment • Topic 7: Mass Transport. 7.3-7.9 • Core Practical 5: Dissection of animal or plant gas exchange or mass transport system or of organ within such a system • Topic 10 : Diversity	Teacher A(4 lessons fortnight). Section 4; genetic information, variation : relationship. • Topic 9 . Gene diversity • 9.3-9.4 • Practical catch • Practical 6: Us aseptic technic to investigate effect of antimicrobial substances on microbial grov Teacher B(6 lessons fortnight. Section 4; genetic information, variation : relationship. • Topic 10 : Dive • 10.2-10.5 • Practical catch		
Why Now?	Section 1 Biological molecules. We begin the course by looking at biological molecules- the building blocks of all living things. This is important because all living cells are made up of only a few groups of molecules that react chemically with each other in similar ways. More importantly these molecules are all based on carbon. We also study water because of its role in all living things. It is the most important component of cells and all life as we know it relies on this simple molecule. Section 2 Cell structure. Alongside Biological molecules, we build on the GCSE knowledge of cells, to develop more in depth understanding of cell structure. The cell is the fundamental unit of life. All organisms whatever their type or size are composed of cells. All new cells are derived from existing ones by one of the following the process of binary fission, mitosis and meiosis. Cells contain the genetic material of an organism and metabolic processes take place within them.	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Cells contain the genetic material of an organism and metabolic processes take place within	Section 3 Organisms exchange substances with their environment. WE build on the knowledge of the cell structure in section 2 by learning about how cells and all living things exchange materials between themselves and their environment. WE look at how substances enter or leave a cell through the plasma membrane.WE also look at the effect of size on how efficient substances are exchanged and the various adaptations organisms have to ensure efficient exchange of materials. Section 4 Genetic Information, variation, and relationships between organisms WE move on to study the variety of life around us. The diversity of life which is brought about primarily by the genes. We also look at the role the environment plays in modifying the characteristics determined by genes. WE the DNA and how mutations in the DNA may lead to different characteristics. WE develop this idea to look at how individuals in a population may have adaptations which help them	Section 3 Organisms exchange substances with their environment. WE build on the knowledge of the cell structure in section 2 by learning about how cells and all living things exchange materials between themselves and their environment. WE look at how substances enter or leave a cell through the plasma membrane.WE also look at the effect of size on how efficient substances are exchanged and the various adaptations organisms have to ensure efficient exchange of materials. Section 4 Genetic Information, variation, and relationships between organisms WE move on to study the variety of life around us. The diversity of life which is brought about primarily by the genes. We also look at the role the environment plays in modifying the characteristics determined by genes. WE the DNA and how mutations in the DNA may lead to different characteristics. 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Fundamental Concepts

molecules common chemistry. This provides indirect evidence for evolution. Despite their great variety, the cells of all living organisms contain only a few groups of carbon-based compounds that interact in similar ways. Carbohydrates are commonly used by cells as respiratory substrates. They also form structural components in plasma Lipids have many uses, including the bilayer of plasma and as respiratory substrates. Proteins form many cell structures. They are also important as enzymes, chemical messengers and components of the blood.

Section 1- Biological Section 1- Biological molecules.

These have basic features in common. Differences between cells are due to the addition of extra features. This provides indirect by binary fission in prokaryotic cells and by mitosis and membrane and, in addition, eukaryotic cells have internal The basic structure of these plasma membranes is the same and enables control of the passage of substances across exchange surfaces by passive or active transport.

molecules.

Organisms exchange substances with their environment

The internal environment of a cell or organism is different 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

Genetic information, variation and relationships between organisms

Biological diversity – biodiversity – is reflected in 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 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

Organisms exchange substances with their environment Section 4 Genetic information, variation and relationships between organisms

SHS Curriculum Maps/SAH/2020

		Cell-surface membranes		are associated with mass	determines the sequence of	
		contain embedded proteins.		transport systems that carry	amino acids during protein	
		Some of these are involved in		substances between the	synthesis. The genetic code	
		cell signalling –		exchange surfaces and the rest	used is the same in all	
		communication between cells.		of the body and between parts	organisms, providing evidence	
		Others act as antigens,		of the body. Mass transport	for evolution. Genetic	
		allowing recognition of 'self'		maintains the final diffusion	diversity within a species can	
		and 'foreign' cells		gradients that bring	be caused by gene mutation,	
		by the immune system.		substances to and from the	chromosome mutation or	
		Interactions between different		cell membranes of individual	random factors associated	
		types of cell are involved in		cells. It also helps to maintain	with meiosis and fertilisation.	
		disease, recovery		the relatively stable	This genetic diversity is acted	
		from disease and prevention		environment that is tissue	upon by natural selection,	
		of symptoms occurring at a			resulting in species becoming	
		later date if exposed to the			better adapted to their	
		same antigen, or			environment. Variation within	
		antigen-bearing pathogen			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	
	Teacher B(6 lessons a	Teacher B(6 lessons a	Teacher B(6 lessons a	Teacher B(6 lessons a	Teacher B(6 lessons a	Teacher B(6 lessons a
	fortnight)	fortnight)	fortnight)	fortnight)	fortnight)	fortnight)
	Biological molecules	Biological Molecules	Topic 2- Nucleic acid	Section 3	7.3 circulatory system of a	Chapter 10 Biodiversity
	1.1- Introductions	1.6 Proteins	2.2 DNA replication	Organisms exchange	mammal.	10.2 Diversity within a
	Describe what a	Explain how amino	Describe the events	substances with their	manniai.	community
	mole is, and what	acids are linked to	which take place during	environment.	Explain why large	Describe what we
	is meant by a	form polypeptides	DNA replication	environment.	organisms move	understand by species
	molar solution		Describe the formation		substances around	diversity
	Explain bonding	- the primary	of a new polynucleotide	6.5 Limiting water loss	their bodies.	
	and the formation	structure of	strand.	Explain how terrestrial plants	 Describe the 	Explain how a diversity index
	of molecules	proteins	Explain the	and insects balance the need		is used as a measure of
	Describe	 Explain how 	semi-conservative	for gas-exchange and the need	features of the	species diversity
		polypeptides are		to conserve water	transport systems	
	polymerisation and	arranged to form	process of DNA		of large organisms.	10.3 Species diversity and
	state what	the secondary	replication	6.6 Structure of the human	Describe the	human activity
	macromolecules	structure and then		gas-exchange system	circulatory system	 Describe the impact of
	are		2.3 Energy and ATP	• Describe how the human	of insects.	agriculture on species
	Describe	the tertiary	 Define what energy is 	gas exchange system is	Describe the	diversity
	condensation and	structure of a	and why organisms need	arranged		
	hydrolysis	protein	it	Explain the functions of the	circulatory system	Explain the balance between
	Describe	• Explain how the	• Explain how ATP stores	human gas-exchange system	of fish.	conservation and farming
	metabolism	quaternary	energy	numun gus exenange system	Describe the	
		structure of a	 Describe how ATP is 	C 7 The mechanism of	circulatory system	10.4 Investigating diversity
	1.2 – monosaccharides.		synthesised	6.7 The mechanism of	of mammals.	0 0 /
	Describe how	protein is formed	 Describe the role of ATP 	breathing		Explain the use of the
	carbohydrates are	Describe the test	in biological processes	• Explain how and why air	• Explain the relative	following techniques in
	constructed	for proteins	in biological processes	is moved into the lungs	efficiency of	comparing genetic
	Describe the		2.4. water and its functions.	when breathing in	different	diversity within, and
	structure of	1.7 Enzymes action.	 Describe the structure of 	• Explain how air is moved	circulatory	between, species:
	monosaccharides	 Explain how 		out of the lungs when	systems.	 observable
		enzymes speed up	the water molecule	breathing out	7.4 The structure of the heart	characteristics
	Describe how to	chemical reactions	State the properties of	Explain what is meant by		 base sequence of
	carry out the	• Describe how the	the water molecule	pulmonary ventilation and	Describe the appearance	DNA
	Benedict's test for	structure of	• Explain the importance	how it is calculated	of the heart and its	 base sequence of
	reducing and		of the water molecule to		associated blood vessels	mRNA
	non-reducing	enzyme molecules	living organisms.	6.8 Exchange of gases in the		 amino acid
	sugars	relates to their	Describe inorganic ions	lungs	• Explain why the heart is	sequence of
		function	and their roles	 Describe the essential 	made up of two adjacent	proteins
	1.3 Disaccharides	 Explain the lock 		features of exchange	pumps	Explain how immunological
	Explain how	and key model of	6. Exchange	surfaces		comparisons are used to
	monosaccharides	enzyme action.	6.1 Exchange between	Explain how gases are	Core Practical 5:	
	are linked together	Explain the	organisms and their	exchanged in the alveoli of	Dissection of animal or	investigate variations in
						proteins
	-	induced-fit model	0	_	plant gas exchange or	proteins
	to form	induced-fit model	environment	humans.	plant gas exchange or	
	to form disaccharides	induced-fit model of enzyme action.	environmentExplain how the size of	humans. 6.9 Enzymes and digestion	mass transport system or	10.5 Quantitative
Chudente will	to form	of enzyme action.	 environment Explain how the size of an organism and its 	humans.6.9 Enzymes and digestionDescribe the structure	mass transport system or of organ within such a	10.5 Quantitative investigations of variation
Students will	to form disaccharides	of enzyme action. 1.8 Factors affecting enzyme	 Explain how the size of an organism and its structure relate to its 	 humans. 6.9 Enzymes and digestion Describe the structure and function of the 	mass transport system or	 10.5 Quantitative investigations of variation Describe how variation is
Students will	to form disaccharides • Describe how	of enzyme action. 1.8 Factors affecting enzyme action	 Explain how the size of an organism and its structure relate to its surface area to volume 	 humans. 6.9 Enzymes and digestion Describe the structure and function of the major parts of the 	mass transport system or of organ within such a system	 10.5 Quantitative investigations of variation Describe how variation is measured
Students will	to form disaccharides • Describe how α-glucose molecules are	of enzyme action. 1.8 Factors affecting enzyme action • Describe how the	 Explain how the size of an organism and its structure relate to its surface area to volume ratio 	 humans. 6.9 Enzymes and digestion Describe the structure and function of the major parts of the digestive system 	mass transport system or of organ within such a system Explain how the structure of	 10.5 Quantitative investigations of variation Describe how variation is measured Explain what sampling is
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Students will	 to form disaccharides Describe how α-glucose molecules are linked to form starch Describe the test for non-reducing sugars. Describe the test for starch. 1.4- starch, glycogen and cellulose. Explain how α-glucose monomers are arranged 	of enzyme action. 1.8 Factors affecting enzyme action • Describe how the rate of an enzyme-controlled reaction is measured • Explain how temperature affects the rate of an enzyme-controlled	 environment Explain how the size of an organism and its structure relate to its surface area to volume ratio Describe how larger organisms increase their surface area to volume ratio Explain how surfaces are specially adapted to facilitate exchange. 6.2 Gas exchange in single-celled organisms and insects Describe how 	 humans. 6.9 Enzymes and digestion Describe the structure and function of the major parts of the digestive system Explain how the digestive system breaks down food both physically and chemically Explain the role of enzymes in digestion of carbohydrates, lipids and proteins 6.10 Absorption of the products of digestion Describe the structure of 	 mass transport system or of organ within such a system Explain how the structure of the heart is related to its functions 7.5 The cardiac cycle Describe the stages of the cardiac cycle Explain how valves control the flow of blood through the heart Explain the volume and 	 10.5 Quantitative investigations of variation Describe how variation is measured Explain what sampling is and why it is used Describe the types of variation and their causes Explain what is meant by the mean and standard variation Catch up practical Teacher A(4 Lessons a fortnight)
Students will	 to form disaccharides Describe how α-glucose molecules are linked to form starch Describe the test for non-reducing sugars. Describe the test for starch. 1.4- starch, glycogen and cellulose. Explain how α-glucose monomers are arranged to form the polymers of 	of enzyme action. 1.8 Factors affecting enzyme action • Describe how the rate of an enzyme-controlled reaction is measured • Explain how temperature affects the rate of an enzyme-controlled reaction	 environment Explain how the size of an organism and its structure relate to its surface area to volume ratio Describe how larger organisms increase their surface area to volume ratio Explain how surfaces are specially adapted to facilitate exchange. 6.2 Gas exchange in single-celled organisms and insects Describe how single-celled organisms 	 humans. 6.9 Enzymes and digestion Describe the structure and function of the major parts of the digestive system Explain how the digestive system breaks down food both physically and chemically Explain the role of enzymes in digestion of carbohydrates, lipids and proteins 6.10 Absorption of the products of digestion Describe the structure of the ileum 	 mass transport system or of organ within such a system Explain how the structure of the heart is related to its functions 7.5 The cardiac cycle Describe the stages of the cardiac cycle Explain how valves control the flow of blood through the heart Explain the volume and pressure changes which take 	 10.5 Quantitative investigations of variation Describe how variation is measured Explain what sampling is and why it is used Describe the types of variation and their causes Explain what is meant by the mean and standard variation Catch up practical Teacher A(4 Lessons a fortnight) 9.3 Genetic diversity and
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Language for Life (Key terms/Vocabulary)	activation energy active immunity, active site, active aerobic, allele allergen allergy , antibiotic, anticodon antigen antioxidant apoplastic, artificial selection, asthma , atheroma, ATP, B cell, B lymphocytes Benedict's test, biodiversity, biomass period of time.Biuret testbody mass index (BMI) cancer a diseasecarcinogen cardiac cycle cardiac outputcarrier molecule (carrier protein, centrifugation cholesterol chromatid chromatin, chromosome codon cohesion collagen fibrous cartilage and bone.community complementary DNA condensation continuous variation, coronary arteries , coronary heart disease (CHD, correlation co-transport counter current covalent bond	activation energy active immunity, active site, active aerobic, allele allergen allergy , antibiotic, anticodon antigen antioxidant apoplastic, artificial selection, asthma , atheroma, ATP, B cell, B lymphocytes Benedict's test, biodiversity, biomass period of time.Biuret testbody mass index (BMI) cancer a diseasecarcinogen cardiac cycle cardiac outputcarrier molecule (carrier protein, centrifugation cholesterol chromatid chromatin, chromosome codon cohesion collagen fibrous cartilage and bone.community complementary DNA condensation continuous variation ,coronary arteries ,coronary heart disease (CHD, correlation co-transport counter current covalent bond	activation energy active immunity, active site ,active aerobic ,allele allergen allergy ,antibiotic ,anticodon antigen antioxidant apoplastic, artificial selection ,asthma ,atheroma ,ATP ,B cell ,B lymphocytes Benedict's test, biodiversity ,biomass period of time.Biuret testbody mass index (BMI) cancer a diseasecarcinogen cardiac cycle cardiac outputcarrier molecule (carrier protein, centrifugation cholesterol chromatid chromatin ,chromosome codon cohesion collagen fibrous cartilage and bone.community complementary DNA condensation continuous variation ,coronary arteries ,coronary heart disease (CHD, correlation co-transport counter current covalent bond	activation energy active immunity, active site ,active aerobic ,allele allergen allergy ,antibiotic ,anticodon antigen antioxidant apoplastic, artificial selection ,asthma ,atheroma ,ATP ,B cell ,B lymphocytes Benedict's test, biodiversity ,biomass period of time.Biuret testbody mass index (BMI) cancer a diseasecarcinogen cardiac cycle cardiac outputcarrier molecule (carrier protein, centrifugation cholesterol chromatid chromatin ,chromosome codon cohesion collagen fibrous cartilage and bone.community complementary DNA condensation continuous variation ,coronary arteries ,coronary heart disease (CHD, correlation co-transport counter current covalent bond	activation energy active immunity, active site ,active aerobic ,allele allergen allergy ,antibiotic ,anticodon antigen antioxidant apoplastic, artificial selection ,asthma ,atheroma ,ATP ,B cell ,B lymphocytes Benedict's test, biodiversity ,biomass period of time.Biuret testbody mass index (BMI) cancer a diseasecarcinogen cardiac cycle cardiac outputcarrier molecule (carrier protein, centrifugation cholesterol chromatid chromatin ,chromosome codon cohesion collagen fibrous cartilage and bone.community complementary DNA condensation continuous variation ,coronary arteries ,coronary heart disease (CHD, correlation co-transport counter current covalent bond	activation energy active immunity, active site ,active aerobic ,allele allergen allergy ,antibiotic ,anticodon antigen antioxidant apoplastic, artificial selection ,asthma ,atheroma ,ATP ,B cell ,B lymphocytes Benedict's test, biodiversity ,biomass period of time.Biuret testbody mass index (BMI) cancer a diseasecarcinogen cardiac cycle cardiac outputcarrier molecule (carrier protein, centrifugation cholesterol chromatid chromatin ,chromosome codon cohesion collagen fibrous cartilage and bone.community complementary DNA condensation continuous variation ,coronary arteries ,coronary heart disease (CHD, correlation co-transport counter current covalent bond
Extended writing Opportunities	The importance of proteins in the control of processes and responses in organisms. The uses of water in living organisms	 Cells and organisms carry out exchanges with their external environment to maintain their internal environment. How bacteria can affect the lives of humans and other organisms 	 The membranes of different types of cells are involved in many different functions. The part played by the movement of substances across cell 	 How energy is transferred within and between organisms. The causes of disease in humans 	2. Using DNA in science and technology	The part played by enzymes in the functioning of different cells, tissues
Maths Across the Curriculum	1 Recognise and make use of appropriate units in calculations. 2. Recognise and use expressions in decimal and standard form 3. Use ratios, fractions and percentages 4. Estimate results 5. Use calculators to find and use power, exponential and logarithmic function. 1.1 Use an appropriate number of significant figure	 Recognise and make use of appropriate units in calculations. Recognise and use expressions in decimal and standard form Use ratios, fractions and percentages Estimate results Use calculators to find and use power, exponential and logarithmic function. Use an appropriate number of significant figure 	.2 Find arithmetic means 1.3 Construct and interpret frequency tables and diagrams, bar charts and histogram 1.4 understand simple probability MS 1.5 Understand the principles of sampling as applied to scientific data MS 1.6 Understand the terms mean, median and mode MS 1.7 Use a scatter diagram to identify a correlation between two variables MS1.8 Make order of magnitude calculations MS 1.9 Select and use a statistical test MS 1.8 Make order of magnitude calculations MS 1.9 Select and use a statistical test MS 1.10 Understand measures of dispersion, including standard deviation and range MS 1.11 Identify uncertainties in measurements.	.2 Find arithmetic means 1.3 Construct and interpret frequency tables and diagrams, bar charts and histogram 1.4 understand simple probability MS 1.5 Understand the principles of sampling as applied to scientific data MS 1.6 Understand the terms mean, median and mode MS 1.7 Use a scatter diagram to identify a correlation between two variables MS1.8 Make order of magnitude calculations MS 1.9 Select and use a statistical test MS 1.8 Make order of magnitude calculations MS 1.9 Select and use a statistical test MS 1.10 Understand measures of dispersion, including standard deviation and range MS 1.11 Identify uncertainties in measurements.	MS 2.1 Understand and use the symbols: =, <>, >, \propto , . No exemplification required. MS 2.2 Change the subject of an equation MS 2.3 Substitute numerical values into algebraic equations MS 2.4 Solve algebraic equations MS 2.5 Use logarithms in relation to quantities that range over several orders of magnitude. MS 3.1 Translate information between graphical, numerical and algebraic forms MS 3.2 Plot two variables from experimental or other data MS 3.3 Understand that y = mx + c represents a linear relationship MS 3.4 Determine the intercept of a graph MS 3.5 Calculate rate of change from a graph showing a linear relationship MS 3.6 Draw and use the slope of a tangent to a curve as a measure of rate of change MS 4.1 Calculate the circumferences, surface areas and volume	MS 2.1 Understand and use the symbols: =, <>, >, \propto , . No exemplification required. MS 2.2 Change the subject of an equation MS 2.3 Substitute numerical values into algebraic MS 2.4 Solve algebraic equations MS 2.5 Use logarithms in relation to quantities that range over several orders of magnitude. MS 3.1 Translate information between graphical, numerical and algebraic forms MS 3.2 Plot two variables from experimental or other data MS 3.3 Understand that y = mx + c represents a linear relationship MS 3.4 Determine the intercept of a graph MS 3.5 Calculate rate of change from a graph showing a linear relationship MS 3.6 Draw and use the slope of a tangent to a curve as a measure of rate of change MS 4.1 Calculate the circumferences, surface areas and volume
Links to careers/ aspirations	Aeronautical engineer, Botanist, conservationist, dietician, Equine Dentist, Forensic scientists, Geoscientist, Hydrotherapist, immunologist, journalist, kinesiologist, lab technician, marine Biologist, Neuro scientist, optician, paramedic, roboticist, sports scientists, urologist, Volcanologist, weather forecaster, Xray technician, yacht master, Zoologist.	Aeronautical engineer, Botanist, conservationist, dietician, Equine Dentist, Forensic scientists, Geoscientist, Hydrotherapist, immunologist, journalist, kinesiologist, lab technician, marine Biologist, Neuro scientist, optician, paramedic, roboticist, sports scientists, urologist, Volcanologist, weather forecaster, Xray technician, yacht master, Zoologist.	Aeronautical engineer, Botanist, conservationist, dietician, Equine Dentist, Forensic scientists, Geoscientist, Hydrotherapist, immunologist, journalist, kinesiologist, lab technician, marine Biologist, Neuro scientist, optician, paramedic, roboticist, sports scientists, urologist, Volcanologist, weather forecaster, Xray technician, yacht master, Zoologist.	Aeronautical engineer, Botanist, conservationist, dietician, Equine Dentist, Forensic scientists, Geoscientist, Hydrotherapist, immunologist, journalist, kinesiologist, lab technician, marine Biologist, Neuro scientist, optician, paramedic, roboticist, sports scientists, urologist, Volcanologist, weather forecaster, Xray technician, yacht master, Zoologist.	Aeronautical engineer, Botanist, conservationist, dietician, Equine Dentist, Forensic scientists, Geoscientist, Hydrotherapist, immunologist, journalist, kinesiologist, lab technician, marine Biologist, Neuro scientist, optician, paramedic, roboticist, sports scientists, urologist, Volcanologist, weather forecaster, Xray technician, yacht master, Zoologist.	Aeronautical engineer, Botanist, conservationist, dietician, Equine Dentist, Forensic scientists, Geoscientist, Hydrotherapist, immunologist, journalist, kinesiologist, lab technician, marine Biologist, Neuro scientist, optician, paramedic, roboticist, sports scientists, urologist, Volcanologist, weather forecaster, Xray technician, yacht master, Zoologist.
Cultural Capital	Research work on proteins and the importance of proteins in medicine including in treating diseases. Example the sequencing of the genome of the coronavirus.	What are the causes of cardiovascular diseases? What are the Social and ethical issues related to genetic screening	Research work by Pharmaceutical companies developing immunosuppressant drugs. Possible methods of transporting drugs How the different vaccine for coronavirus works	The cause of cardiovascular diseases and how it is treated. Effect of mass transport in plants and the impact on farming and food production.	What is the role of genetics and the environment in determining characteristics?	What are the roles of zoos and seed banks in botanical gardens in the survival of species.
Practical Application of Skills	At. a. use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). AT b use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer. AT c use laboratory glassware apparatus for a variety of	At. a. use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). AT b use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer. AT c use laboratory glassware apparatus for a variety of	At. a. use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). AT b use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer. AT c use laboratory glassware apparatus for a variety of	At. a. use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). AT b use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer. AT c use laboratory glassware apparatus for a variety of	At. a. use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). AT b use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer. AT c use laboratory glassware apparatus for a variety of	At. a. use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). AT b use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer. AT c use laboratory glassware apparatus for a variety of

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