## Revision checklist – Homeostasis GCSE Trilogy Biology

#### Use this checklist to highlight your confidence and revision preparedness for upcoming exams. R - None. A - Some. G - Ready!

An electronic version can be available to you if required.

Specification	Statement	Additional details	R	Α	G
4.5.1	I can define and explain what homeostasis is	Regulation of internal conditions in a cell or			
Homeostasis		organism			
		Maintaining optimum conditions for function			
		Response to internal and external changes			
	I can identify what optimal conditions are	Blood glucose concentration			
	needed for enzyme action	Body temperature			
		Water levels			
	I can describe the automatic control systems that	Nervous system			
	lead to responses	Chemical – endocrine system			
	I can recognise and describe the structures in the	Receptors (cells)			
	control systems for nervous and chemical	Coordination centres (brain, spinal cord,			
	responses	pancreas)			
		Effectors (muscles, glands)			
	I can describe the function of a receptor cell	Detect specific stimuli e.g., temperature,			
		pressure, chemical, light intensity/wavelength			
	I can identify and describe the roles of different	E.g., brain, spinal cord, pancreas, receive and			
	co-ordination centres	process information from receptors			
	I can describe the responses of specific effectors	E.g., muscles or glands; respond to restore			
	and explain their importance	optimum levels			
4.5.2.1	I can explain how the structure of the nervous	Receptor (detects specific stimulus)			
Structure and function (The human nervous	system is adapted to its functions	Co-ordinator			
		Effector (response)			
	I understand the role of the nervous system for a	React to surroundings			
	person's health and survival	Co-ordinate behaviour			
system)	I can describe the signal and response	Receptors detect stimuli and generate an			
	mechanism of a nervous impulse	electrical impulse			

		Neurones (nerve cells) transmit electrical		
		impulses		
		CNS (Central Nervous System) is the brain and		
		spinal cord		
		CNS receives, co-ordinates and sends response		
		to specific effectors		
		Effectors – muscle, gland functionality		
	I can identify the cell / tissue / organ structures in	Receptor		
	the reflex arc	Sensory neurone		
		Synapse (gap between neurones)		
		Central Nervous System (Spinal cord only)		
		Relay Neurone		
		Motor neurone		
		Effector		
	I can describe the functional properties of	Muscle – contraction (movement)		
	effectors in response to a stimulus	Endocrine gland – secretion (of a specific		
		hormone)		
	I can explain the importance of reflex actions			
	I know reflex actions are automatic and rapid	Do not involve a conscious decision		
		(involuntary)		
4.5.3.1 Human	I can describe the principles of hormonal co-			
endocrine	ordination and control by the human endocrine			
system	system			
	I know the endocrine system is composed of			
	glands which secrete hormones into the			
	bloodstream			
	I know a hormone is a chemical made from	For a specific function / receptor / target organ		
	protein that has a specific shape			
	I know a response from the endocrine system is	Nervous system faster and shorter effect time		
	slower and acts longer than a response from the			
	nervous system			
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	I know the pituitary gland is a 'master gland'	Controls many endocrine responses		
	I can identify some hormones the pituitary gland	E.g., ADH – increases water reabsorption into		
	secretes into the blood that each control specific	blood (kidney)		
	body conditions			
	I understand that the presence of one hormone	The original hormone secreted is the stimulus for		
	can lead to other glands to secrete other	a secondary response on another target organ		
	hormones			
	I can identify the position of the endocrine glands	Pituitary gland		
		Pancreas		
		Thyroid	-	
		Adrenal gland	-	
		Ovary / ovaries	-	
		Testes		
4.5.3.2 Control	I know that blood glucose concentration is			
of blood	monitored and controlled by the pancreas			
glucose	I understand that if blood glucose concentration			
concentration	is too high, the pancreas produces and secretes			
	the hormone insulin into the blood.			
	I know that insulin is needed for all cells to absorb			
	glucose			
	I can describe the effect of insulin on liver and	To store excess glucose in the polymer		
	muscle cells	glycogen		
	I can explain how insulin controls blood glucose	Decrease concentration of glucose in blood		
	(sugar) levels in the body			
	I understand that when blood glucose			
	concentration is too low, the pancreas produces			
	the hormone glucagon			
	I can describe the effect of glucagon on	High glucagon levels.		
	glycogen and ultimately, blood glucose	Glycogen broken down into glucose in		
	concentration	cytoplasm		
		Glucose released into blood from storage cells		
		Blood glucose concentration increases		

	I know that diabetes is a condition where the person cannot internally control their blood			
	glucose level			
	I know that there are two types of diabetes	Type 1 and Type 2		
	I can describe the cause of Type 1 diabetes and	Pancreas cannot produce (enough) insulin		
	treatment options	Uncontrolled high blood glucose levels		
		Treated with insulin injections		
	I can describe the cause of Type 2 diabetes and	Cells no longer respond to insulin hormone		
	treatment options	Treated with a sugar / carbohydrate-controlled diet		
		Treated with an exercise regime to increase		
		respiration of glucose (and therefore removal from blood)		
		Obesity is a risk factor		-
	I can compare treatment options for Type 1 and Type 2 diabetes.			
	I can evaluate information about the relationship			
	between obesity and diabetes			
	I can make informed recommendations considering social and ethical issues			
	I can describe the negative feedback cycle to	High concentrations of one hormone inhibit the		
	control blood glucose involving glucagon and insulin	other hormone's production.		
4.5.3.3	I know that during puberty, reproductive			
Hormones in	hormones cause secondary sex characteristics to			
human	develop			
reproduction				
	I can describe what testosterone is and its effect	Testosterone is a hormone		
	on the male reproductive system	Produces in the testes		
		Stimulates sperm production	 	
	I can describe what oestrogen is and its effect on	Oestrogen is a hormone		
	the temale reproductive system	Produced in the ovary	 	
		Develops and maintains the uterus lining		

	I know that ovulation occurs approximately every 28 days	When a female reaches puberty	
	I know that a follicle matures into an egg (ovum) during the menstrual cycle		
	I can describe the hormones in the menstrual cycle and their effect	FSH – Follicle stimulating hormone – maturation of an egg in the ovary	
	,	LH – Luteinising hormone – stimulates ovulation	
		Oestrogen develops and maintains the uterus	
		When progesterone levels drop, the uterus lining is shed (period – no fertilisation)	
	I can describe the interactions between the four menstrual cycle hormones	More FSH stimulates more oestrogen production	
		More oestrogen stimulates more LH production	
		LH production inhibits FSH production (negative feedback)	
		More LH stimulates progesterone production	
		Progesterone inhibits FSH and LH production	
4.5.3.4	I can describe the different hormonal and non-	Oral contraceptives inhibit FSH	
Contraception	hormonal methods of contraception	Injection / Implant / Patch contain	
		progesterone	
		Barrier methods e.g., condoms, diaphragms	
		Intrauterine devices (IUD)	
		Spermicidal agents	
		Abstinence	
		Sterilisation via surgery e.g., vasectomy	
	II can explain and evaluate the use of different	Inhibiting FSH production	
	methods of contraception	Inhibit maturation and release of eggs over	
		months/years	
		Prevention of the egg reaching the sperm	
		Prevent implantation of embryo	
		Kill or disable sperm	
		Not having sex	

	I can evaluate the personal, social, economic and environmental implications for the use of			
	I can make decisions based on evaluating			
	evidence and arguments for and against the use			
	or confideeplive memods	ESU and UU fortility drug administered to warson		
4.5.3.5 (H) INE	repreductive technologies to tract infortility	FSH and LH remiting and administered to women		
bermenes to	Learn describe the banefite of fortility drugs			
treat fertility	I can describe the benefits of tertility drugs	way after treatment		
	I can describe the process of IVF	A woman is treated with FSH and LH to		
		produce and mature several eggs		
		Eggs are collected from ovary and fertilised by		
		sperm in a laboratory from father		
		Fertilised eggs develop into embryos		
		One or two embryos inserted into mother's		
		uterus (womb)		
	I can evaluate social, ethical, and procedural methods associated with the treatment of infertility	Emotional and physical stress		
		Not high success rates		
		Can lead to multiple births – increased risk for		
		babies and mother		
4.5.3.6 (H)	I can explain the role of thyroxine in the body	Thyroid produces thyroxine		
Feedback		Stimulates basal metabolic rate		
systems		Important for growth and development		
		Controlled by negative feedback		
	I can explain the role of adrenaline in the body	Adrenal glands produce adrenaline		
		Fear or stress stimulus		
		Increases heart rate		
	I can describe the effect of increased heart rate	E.g., Increased oxygen provision		
	on the rate of aerobic respiration	E.g., Increased glucose provision		
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	I can interpret and explain diagrams of negative	E.g., Menstrual cycle hormones	
	feedback control systems	E.g., Thyroxine	
		E.g., Blood glucose control insulin and	
		glucagon	
Practical	Required Practical 7 – Investigation into the	E.g., practice, drug involvement (e.g., caffeine	
requirements	effect of a factor on human reaction time	/ alcohol / glucose)	
Mathematical	I can calculate a mean	E.g., Reaction times in ms	
requirements	I can convert values of orders of magnitude	I understand 1ms (millisecond) is 1/1000 <sup>th</sup> of a	
		second	
	I can extract and interpret information from	E.g., the functionality of the nervous system	
	graphs, charts, and tables	E.g. Effect of insulin in blood glucose levels in	
		people with / without diabetes	
		E.g. Hormone levels during the menstrual cycle	
	I can translate information about reaction times		
	between numerical and graphical form		
	I understand that the speed in which an impulse		
	travels is limited		
	I can substitute values of speed, distance or time	E.g., Calculating response time from a distance	
	into a given equation		
	I can translate tables and bar charts	E.g., glucose, ions and urea concentration in	
1		the blood before and after filtration	

# Revision checklist – Genetics GCSE TRILOGY Biology

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Specification	Statement	Additional details	R	Α	G
4.6.1.1 Sexual	I know that meiosis leads to non-identical cells	I can spell meiosis			
and asexual	being formed.				
reproduction	I know that mitosis leads to identical cells being	I can spell mitosis			
	formed				
	I understand that sexual reproduction involves	Sperm and egg in animals			
	the joining (fusion) of male and female gametes	Pollen and egg in flowering plants			
	I can describe in sexual reproduction there is a				
	mixing of genetic information which leads to				
	variation (variety) in the offspring.				
	I know that gametes are formed as a result of				
	meiosis				
	I know that in asexual reproduction, only one	There is no fusion of gametes.			
	parent is needed	There is no mixing of genetic information			
		Genetically identical offspring			
		Clones			
		Only mitosis involved			
4.6.1.2 Meiosis	I know that meiosis results in the chromosome				
	number to halve.				
	I know that the fertilisation of gametes restores	Found in adult body cells			
	the full number of chromosomes.				
	I know that cells that divide by meiosis happens in	Ovaries (female)			
	the reproductive organs	Testes (male)			
	I can describe cell division by meiosis	Copies of the genetic information are made			
		Cells divides twice			
		Four gametes are produced			
		Each gamete has a single set of chromosomes			
		All gametes are genetically different to each			
		other			

	I know that after fertilisation, cells divide by mitosis.	Increasing the total number of cells		
	I can describe what happens to cells when they	Embryonic stem cells		
	divide in the embryo by mitosis.	Replicate to make more stem cells		
		Differentiate (specialise)		
4.6.1.3 DNA	I can describe the structure of DNA	Double helix		
and the		Two chains of nucleotides (polynucleotide)		
genome		Complementary base pairs		
		Phosphate		
		Deoxyribose sugar		
		Base (Adenine / Thymine / Cytosine / Guanine)		
	I can describe the term genome	The entire genetic material of an organism		
	I know that DNA is contained in chromosomes			
	I know that a gene is a small section of DNA	On a chromosome		
	I can describe how genes code for a sequence of amino acids	A gene codes for a specific protein		
	I know that the human genome project finished in 2003			
	I know that the human genome project was	Useful for medical screening		
	studied to help identify links between genes for	Useful for medical diagnosis		
	different people	Useful for medical treatment		
	I know the importance of the human genome	To search for genes linked to different diseases		
	project	Understanding and treatment of inherited		
		disorders		
		Use in tracing human migration patterns from		
		the past (ancestry / evolutionary links)		
4.6.1.4	I can explain genetic inheritance terms	Gamete		
Genetic		Chromosome		
inheritance		Gene		
		Allele		
		Dominant		
		Recessive		
		Homozygous		
		Heterozygous		
		Genotype		

		Phenotype		
	I know that some characteristics are controlled	Fur colour in mice		
	by one single gene	Red-green colour blindness in humans		
	I can define different versions of a gene are			
	called 'alleles'			
	I know that the allele / alleles present are given a			
	letter code called the 'genotype'			
	I know that the genotype codes for a phenotype	Phenotype – expression of the characteristic (what is observed)		
	I know how alleles are expressed given their	Dominant – always expressed if one or two		
	genotype	copies present		
		Recessive -only expressed if two copies present		
		Homozygous – both alleles present are the		
		same		
		Heterozygous – both alleles present are		
		different		
	I know that it is usually combinations of multiple			
	genes interact rather than one single gene that			
	influences a phenotype			
	I understand that probability is used to predict	Using a genetic diagram to predict offspring		
	the results of a single gene cross	phenotype		
	I can complete a punnet square diagram	Genetic cross diagram		
	I can extract and interpret information from a	Pedigree diagrams used		
	genetic cross diagram to link to family trees			
(H)	I can construct a genetic diagram			
4.6.1.5	I know that genetic disorders are inherited			
Inherited	I know that genetic disorders are caused by the			
disorders	inheritance of specific alleles			
	I know the symptoms of polydactyly	Having extra fingers / toes (digits)		
	I know that polydactyly is caused by a dominant	A person only needs one of the affected alleles		
	allele	to cause the symptoms		
	I know the symptoms of cystic fibrosis	Cell membrane disorder – over production of		
		mucus	$ \rightarrow $	
		Mucus build up in lungs prevents effective gas		
		exchange		

		Mucus build up in pancreas prevents enzymes acting on substrates for digestion (growth inhibition)		
	I know that cystic fibrosis is caused by a recessive gene	A person needs to have two recessive alleles (homozygous recessive) for the condition to cause the symptoms		
	I can make informed judgements about issues	Economic – related to money and prosperity		
	concerning embryo screening given information	Social – jobs, health, quality of living		
		Ethical – decision making for another yes/no	 	
	I appreciate that embryo screening and gene therapy may limit suffering	Ethical issues arise $-e.g.$ abortion kills the foetus (they did not have the choice to live or die)		
4.6.1.6 Sex determination	I know that ordinary human body cells contain 23 pairs of chromosomes			
	I know that of the 23 pairs, there are 22 pairs of chromosomes that only code for characteristics			
	I know that one pair of chromosomes determines	Female – XX		
	secondary sexual characteristic development	Male – XY		
	I can draw a genetic cross / punnet square diagram to show sex inheritance			
4.6.2.1 Variation	I can describe what the genome is	The range of all genes in a cell / organism / species		
	I know that the genome can interact with the environment to influence the development of an organism	E.g. a person genetically has a fair skin colour, which darkens due to sunlight causing them to 'tan'		
	I know that variation means the differences in the	(or population)		
	characteristics of individuals of the same species	Caused by genes inherited (genetic)		
		Caused by developed conditions (environmental)		
		Caused by a combination of genetic and environmental influence		
	I can state that there is usually extensive genetic variation within a species			
	I can recall that all variants of a gene or	Most mutations have no effect on phenotype		
	characteristic arise from mutations	Some influence phenotype		
		Very few determine phenotype		
	I know that mutations occur continuously			

	I understand that if a new phenotype is suited to	Increase in number of the variant with the	
	the environmental change, it can lead to a	beneficial characteristic	
	relatively rapid change in the species	Leading to new species being formed	
4.6.2.2	I can describe evolution	A change in the inherited characteristics of a	
Evolution		population over time	
		Through a process of natural selection	
		This may result in the formation of a new	
		species	
	I know that the theory of evolution by natural		
	selection states that all species have evolved		
	from simple lifeforms that first developed more		
	than three billion years ago		
	I can explain how evolution occurs through	Giving rise to phenotypes best suited to their	
	natural selection of variants	environment	
	I know the definition of a species	Individuals can no longer interbreed	
		No longer produce fertile offspring	
		New species formed	
	I know that new species can occur through	Reproductive isolation	
	natural selection if two populations of the same		
	species become so different in phenotype to		
	each other		
4.6.2.3	I can explain the impact of selective breeding in	Food crops from wild plants	
Selective	different applications	Domesticated animals from wild animals	
breeding	I know that selective breeding is an artificial	Humans decide which organisms breed	
	selection mechanism	together	
	I know that selective breeding is a process by	This has occurred for thousands of years	
	which humans breed plants and animals for		
	particular genetic characteristics		
	I can describe the process of selective breeding	Choosing parents with the desired	
		characteristics	
		From a mixed population	
		Breed together the parents	
		Continue over many generations	
		Until the offspring show the desired	
		characteristics	
		Disease resistance in food crops	

	I can identify examples of particular desired	Animals which produce more meat or milk	
	characteristics	Domestic dogs with a gentle nature	
		Large or unusual flowers	
	I understand there are issues with selective	'Inbreeding' where some breeds are more	
	breeding	prone to disease or inherited disorders	
		Ethical challenge of deciding the fate or	
		offspring due to the choices made by humans	
4.6.2.4	I can describe genetic engineering as a process	Involves the modifying of a genome of an	
Genetic		organism	
engineering		Introducing a gene from another organism	
		To give a desired characteristic	
	I know that plant crops have been genetically	To produce bigger, better fruits	
	engineered	To be resistant to disease(s)	
	I know how bacterial cells can be genetically	E.g. human insulin	
	engineered to produce useful substances	Genes from the chromosomes of humans (and	
		other organisms)	
		Are cut out from the host cell DNA	
		Then transferred to the (vector) DNA of another	
		organism	
	I can explain the potential benefits and risks of	In agriculture	
	genetic engineering	In medicine	
	I understand that people can object to genetic		
	engineering		
	I know that GM crops are called 'genetically		
	modified' if they have their DNA changed		
	I can describe benefits of GM crops	Resistant to insect attack	
		Resistant to herbicides	
		Increased yield (typical result)	
	I can describe concerns of GM crops	Effect on populations of wild flowers and	
		Human health when eating GM crops	
		Effects have not been fully explored	
	I know that modern medical research is exploring		
	ine possibility of generic modification to		
(11)		Entrymos are used to isolate the required same	
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	I can describe the main steps in the process of	This gene is inserted into a vector	<u> </u>	
	genetic engineering	The vector is usually a bacterial plasmid or a		
		virus		
		The vector is used to insert the gene into the		
		required cells		
		Genes are transferred to the cells of animals,		
		plants or microorganisms at an early stage in		
		their development		
		The organism develops with desired		
		characteristics		
	I can interpret information about genetic			
	engineering techniques			
	I can make informed judgements about issues	(and cloning)		
	concerning genetic engineering and GM crops			
4.6.3.1	I can describe the evidence for evolution	Fossils		
Evidence for		Antibiotic resistance		
evolution	I know that the theory of evolution by natural	Evidence for Darwin's theory is now available		
	selection is now widely accepted	Characteristics are passed on to offspring in		
		genes		
		Further evidence in the fossil record		
		Antibiotic resistance development (evolution)		
		in bacteria		
4.6.3.2	I know that fossils are the 'remains' of organisms	Found in rocks		
Fossils	from millions of years ago			
	I can describe the ways that fossils are formed			
	Parts of organisms that do not decay because	Water		
	those conditions are absent	Microorganisms		
		Warmth		
		Oxygen		
	Parts of the organism are replaced by minerals as			
	they decay			
	Preserved traces of organisms	Footprints		
		Burrows		
		Rootlet traces		
	I know that many forms of life were soft-bodied	Leave few traces behind		
		Traces left destroyed by aeological activity		1
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	I understand that scientists cannot be certain		
	about how life began on Earth		 
	I can extract and interpret information from	Common ancestor	
	evolutionary trees	Relatedness between species	
4.6.3.3	I know that extinction occurs when there are no		
Extinction	living individuals of a species still alive		
	I can describe factors which may contribute to		
	the extinction of a species		
4.6.3.4	I know that bacteria evolve rapidly because they		
Resistant	reproduce at a fast rate		
bacteria	I can describe how mutations of bacterial	Strains may be resistant to antibiotics	
	pathogens produce new strains	Resistant strains are not killed by antibiotics	
		Antibiotic resistant strains survive and	
		reproduce	
		Population of the resistant strain rises	
		People are not immune so resistant strain can	
		spread quicker	
		No effective treatments available for antibiotic	
		resistance	
	I know that MRSA is resistant to antibiotics	Methicillin Resistant Staphylococcus aureus	
	I know that it is possible to reduce the rate of	Doctors limit supply / prescription of antibiotics	
	development of antibiotic resistant strains of	to non-serious / viral infections	
	bacteria	Patients complete the course of antibiotics	
		killing all the bacteria (less bacteria, less	
		chance of mutations)	
		Aaricultural use of antibiotics restricted	
	I know that the development of new antibiotics is	Unlikely to keep up with the emergence of new	
	costly and slow	resistant strains	
4.6.4	I know that traditionally, living things are classified		
Classification	into groups because of structure and		
ofliving	characteristics		
organisms	I can identify Carl Linnaeus' classification system	Kingdom	
	used today	Phylum	
	, ,	Class	
		Order	
		Family	
L			

		Genus		
		species		
	I can name organisms using the binomial system	Genus species		
	I can describe the impact of developments in	E.g. the (electron) microscope		
	biology on classification systems	E.g. genetic fingerprinting		
	I can describe the impact of developments in			
	biology on classification systems			
	I know that evidence of internal structures			
	became more developed due to the			
	improvement of different microscopes			
	I know that biochemical processes, when			
	understood, progressed the models of			
	classification			
	I know that chemical analysis data gave rise to			
	the 'three domain system'		_	 
	I know that the 'three domain system' is	Archaea (primitive bacteria, extremophiles)		
	developed by Carl Woese	Bacteria (true bacteria)		
		Eukaryota (protists, fungi, plants, animals)		
	I know that evolutionary trees are a method to			
	show how organisms are related			
	I know that classification data is used for	Fossil data		
	evolutionary trees		_	
Mathematical	I can use direct proportion and simple ratios to			
skills	express the outcome of a genetic cross			

## Revision checklist – Ecology GCSE Trilogy Biology

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Specification	Statement	Additional details	R	Α	G
4.7.1.1	I can describe the levels of organisation of an	Individual organism			
Communities	ecosystem	Population			
		Community			
		Ecosystem			
	I can describe the importance of				
	interdependence and competition in a				
	community				
	Given information, I can suggest factors for which				
	organisms are competing for in a given habitat				
	I can suggest how organisms are adapted to the				
	conditions in which they live				
	I can define ecosystem	The interaction of a community of living			
		organisms (biotic)			
		With non-living (abiotic) parts of their			
		environment			
	I can describe how, in order to survive and				
	reproduce, organisms need a supply of materials				
	from their surroundings and from other living				
	organisms living there				
	I know plants in a community or habitat often	Light			
	compete with other	Space			
		Water			
		Mineralions			
	I know animals in a community or habitat often	Food			
	compete with other	Mates			
		Territory			
	I understand that in a community, different	Food			
	species depend on each other for resources	Shelter			
		Pollination			

		Seed dispersal		
	I can define interdependence	Different species rely on each other for		
		resources		
	I know that if one species is removed from a			
	habitat, this can affect the whole community			
	I know that a stable community is one where all			
	the species and environment factors are in			
	balance			
	I know that a stable community the population			
	sizes of different species remain fairly constant			
4.7.2 Abiotic	I can explain how a change in an abiotic factor	Given data or context		
factors	can affect a community			
	I know that abiotic factors are non-living factors	Light intensity		
	that affect a community	Temperature		
		Moisture levels (humidity, water in soil)		
		Soil pH and mineral content		
		Wind intensity and direction		
		Carbon dioxide levels for plants		
		Oxygen levels for aquatic animals		
4.7.1.3 Biotic	I can explain how a change in a biotic factor	Given data or context		
factors	might affect a community			
	I know that biotic factors are living factors that	Availability of food		
	affect a community	New predators arriving		
		New pathogens		
		One species outcompeting another		
	I know that when numbers of a population fall			
	too low then they are no longer sufficient to			
	breed			
4.7.1.4	I can explain how an organism is adapted to live	Given information		
Adaptations	in their natural environment			
	I know that organisms have adaptations that			
	allow them to survive in the conditions they			
	normally live in			
	I know different types of adaptation	Structural		
		Behavioural		
		Functional		

	I understand that extremophiles are organisms	High temperature		
	that live in environments that are very extreme	High pressure		
		High salt concentration		
	I know that bacteria that live-in deep-sea vents			
	are extremophiles			
4.7.2 Levels of	I know that organisms that photosynthesise are			
organisation	producers			
	I understand that biomass is produced because	Glucose can be used to make other molecules		
	of photosynthesis	in the plant / producer		
	I know that feeding relationships within a			
	community can be represented by a food chain			
	I know that all food chains begin with a producer	Producers synthesise molecules for the food		
		chain		
	I can identify producers in a food chain	Green plants		
		Algae		
	I can describe different methods that are used to	Transects		
	determine the distribution and abundance of	Random co-ordinates		
	species in an ecosystem	Using a quadrat		
	I can explain why producers are eaten by			
	primary consumers			
	I understand that primary consumers are			
	consumed by secondary consumers			
	I know that secondary consumers are consumed			
	by tertiary consumers			
	I can define the term consumer	Consumers kill and eat other animals		
		Digest and absorb the nutrients consumed		
	I can define the term predator	An organism that kills and eats another animal		
	I can define the term prey	An organism that is killed by a predator and		
		eaten		
	I understand that the rise and fall of a population	More prey need to be available for numbers of		
	occurs in cycles	predators to increase over time		
	I understand that in a stable community,		I T	
	population sizes with rise and fall			
4.7.2.2 How	I can recall that many different materials cycle		T	   _
materials are	through the abiotic and biotic components of an			
cycled	ecosystem			

	I understand the importance of the carbon cycle		
	I understand the importance of the water cycle to living organisms		
	I know that all materials in the living world are recycled	This provides the building blocks for future organisms	
	I can explain the importance of the carbon cycle	Returns carbon from organisms to the atmosphere as carbon dioxide	
	I can describe each process within the carbon	Photosynthesis Photosynthesis	
	transferred to	Consuming (Eating/digesting)	
		Decomposition   Fossilisation	
	I can explain the importance of the water cycle	Combustion (tossil tuels)   Water drains from the land into the seas	
	for plants and animals on land	Water continuously evaporates Water continuously undergoes precipitation	
	I can describe the role of a microorganism in cycling materials through an ecosystem	Microorganisms return carbon to the atmosphere as carbon dioxide	
		$CO_2$ is returned during decomposition Mineral jons are returned to the soil	
		Human interaction	
Biodiversity	the different species of organism in a location	Within an ecosystem	
	I know that great biodiversity ensures the stability of ecosystems		
	I know that biodiversity reduces the dependence of one species on another	Food Shelter	
		Maintaining the physical environment	
	species on Earth, relies on us maintaining a good level of biodiversity		
	I know that many human activities are reducing	Waste production	
		Delotestation	

		Global warming	
	I know that it is under human control to try and stop the reduction of biodiversity		
4.7.3.2 Waste	I know that there is an increasing requirement for	Rapid growth in the human population	
management	resources	Increase in the standard of living	
	I know that with an increased use of resources, there is an increased consequence of waste production		
	I understand that increased waste production	In water – sewage, fertiliser, toxic chemicals	
	leads to pollution	In air – smoke, acidic gases	
		On land – from landfill, toxic chemicals	
	I know that pollution kills plants and animals which reduces biodiversity		
4.7.3.3 Land	I know that humans reduce the amount of land	Building	
use	available for other animals and plants	Quarrying	
		Farming	
		Dumping waste	
	I know that peat bogs are destroyed to produce garden compost		
	I know that destroying peat bogs reduces the	Reduces biodiversity (plant, animal and	
	area of that habitat	microorganism variety)	
	I know that peat can also be burned which releases carbon dioxide into the atmosphere	Or can decay	
	I understand that there is a conflict between the need for cheap available compost	To increase food production	
	I understand that there is a need to conserve	As habitats for diversity	
	peat bogs and peatlands	Reduce carbon dioxide emissions	
4.7.3.4	I can describe why large-scale deforestation in	Provide land for cattle fields	
Deforestation	tropical areas occurs	Provide land for rice fields	
		Grow crops for biofuels	
	I can evaluate the environmental implications of	E.g. The impact on carbon dioxide emissions	
	deforestation	with reduced photosynthesis	
		E.g. The impact of carbon dioxide and	
		methane emissions on global atmospheric	
		temperatures	

		E.g. The impact of carbon dioxide and		
		methane emissions on global warming leading		
		to habitat destruction / change		
4.7.3.5 Global	I can describe some of the biological	E.g. Habitat destruction		
warming	consequences of global warming	E.g. Coastal flooding		
		E.g. Climate change – more extreme climate /		
		weather		
		E.g. Ocean acidification		
	I know that levels of carbon dioxide and			
	methane in the atmosphere contribute to global			
	warming			
	I know that global warming and climate change	Peer review increases validity and trust of		
	has the scientific consensus (agreement) that is	evidence		
	understood from peer reviews of thousands of			
	publications			
	I understand that incomplete evidence brings	In complex contexts		
	uncertainty to justify results			
4.7.3.6	I can describe and explain the positive human	Breeding programmes for endangered species		
Maintaining	interactions in an ecosystem	Protection and regeneration of rare habitats		
biodiversity		Reintroduction of field margins and hedgerows		
		in agricultural areas (where farmers grow one		
		type of crop)		
		Reduction of deforestation and carbon dioxide		
		emissions by some governments		
		Recycling resources rather than dumping		
		waste in landfill		
	I can describe and explain the negative human	E.g. Poaching		
	interactions in an ecosystem	E.g. Illegal pet trade		
		E.g. Land use clearance / change		
		E.g. Use of fertiliser, pesticides and herbicides in		
		farming		
	I can evaluate information about methods used	Given information		
	to tackle negative human impacts on the			
	environment			
	I can explain and evaluate the conflicting	Given appropriate information		
	pressures on maintaining biodiversity			

		Absorb the small, soluble molecules by diffusion	
		into the microorganism	
4.7.4.2	I know that a pyramid of biomass shows the	Looks like a pyramid shape	
Pyramids of	relative amount of biomass in each level of a	Level 1 is at the bottom of the pyramid	
biomass	food chain		
	I can construct / draw a pyramid of biomass	Given data	
4.7.4.3 Transfer	I can describe a pyramid of biomass		
of biomass	I can explain how biomass is lost between	Respiration (movement)	
	different trophic levels	Respiration (constant body temperature)	
		Waste products - egestion (faeces)	
		Waste products – urea and water (urine)	
		Indigestible	
	I know that producers are mostly plants and		
	algae that transfer about 1% of the energy from		
	light for photosynthesis		
	I know that ~10% of the biomass from each		
	trophic level is transferred to the level above it		
	I can explain how the loss of biomass affects the		
	number of organisms at each trophic level		
Practical skills	Required Practical – Measure the population size	Using sampling techniques to investigate the	
	of a common species in a habitat	effect of a factor on the distribution of a	
		species	
Mathematical	I can extract information from charts, graphs and	Relating to the interaction of organisms within a	
skills	tables	community	
		The effect of abiotic factors on organisms	
		The effect of biotic factors on organisms	
		Predator – prey cycles	
	I can calculate an arithmetic mean	In context of abundance of organisms	
	I can identify the mean, mode and median in a		
	set of data		
	I can plot and draw graphs	Choice of graph	
		Selecting appropriate scale for each axes	
	I can calculate the rate changes	Decay of biological material	
	I can translate data between numbers and	Rate of decay	
	graphs		
	I can draw a pyramid of biomass		

I can calculate percentage efficiency	Biomass transfers from one trophic level to another		
	% efficiency = Change / Original x 100		
I can convert fractions and percentages			