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BIOLOGY– YEAR 11 – ECOLOGY

A	ADAPTATIONS AND INTERDEPENDANCE	
1	ECOSYSTEM	Interaction of a community of living organisms and the nonliving parts of the environment
2	COMPETITION	Plants; light and space, water and mineral ions
		Animals; compete with each other for food, mates and territory.
3	INTER-DEPENDENCE	Each species depends on others for food, shelter, pollination, seed dispersal etc.
		Removing one species can affect the whole community.
4	ABIOTIC	Non-living; E.g. light intensity / temperature / moisture / soil pH and mineral content / CO_2 levels for plants / O_2 levels for aquatic organisms
5	BIOTIC	Living; E.g. availability of food/ predators / pathogens / breeding partners
6	ADAPTATIONS	Features that enable organisms to survive in their normal living conditions. E.g. Structural, behavioural, functional.

B	ORGANISATION	
1	PRODUCERS	Photosynthetic organisms. Start of a food chain / produce biomass. E.g. green plants and algae
2	FEEDING RELATIONSHIPS	Primary consumers eat producers. Secondary consumers eat primary consumers etc.
		Predator; consumer that kills and eats Prey; eaten by predators Predator-prey cycles rise and fall.
3	CYCLES	Materials in the living world are recycled. Microorganisms help to cycle materials through ecosystem.
		Carbon cycle; returns carbon from organisms to atmosphere as carbon dioxide.
		Water cycle; continual evaporation and precipitation.

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C BIODIVERSITY

1	BIODIVERSITY	Ensures stability of ecosystems Has been decreasing, but recent measures taken to stop this.
2	WASTE MANAGEMENT	Increase population —> increased waste and pollution —> decrease biodiversity Types of pollution; water / air / land
3	LAND USE	Increase land use for farming / building / quarrying / waste. Destruction of peat bogs; reduction in habitat / release of carbon dioxide into atmosphere.
4	DEFORESTATION GLOBAL WARMING	Deforestation in tropical areas for agriculture and biofuels. CO_2 and methane increasing —> global warming.
5	MAINTAINING BIODIVERSITY	Humans have positive and negative interactions with ecosystems. E.g. breeding programs / regeneration of habitats / field margins and hedgerows / recycling / Government initiatives

D FIELD INVESTIGATIONS

1	SAMPLING A POPULATION	SAMPLING; The numbers of organisms that are counted in a sample site.
		RANDOM; use of quadrats at random coordinates (random number generator) to gain an estimate.
		SYSTEMIC; ordered sampling e.g. along a transect line, to determine a trend or pattern across a habitat.
2	QUADRAT	A square frame (usually 1m x 1m) used to measure abundance / distribution of slow or non-moving organisms
3	TRANSECT LINE	A line created, e.g. using a tape measure, alogn which sampling occurs.
4	PERCENTAGE COVER	The percentage of the quadrat area that is covered by one species (eg grass). Used when counting individual organisms is difficult.
5	ESTIMATED POPULATION SIZE	$= \frac{\text{total area}}{\text{area sampled}}$ X no. of organisms counted

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BIOLOGY– YEAR 11 – ECOLOGY TRIPLE CONTENT

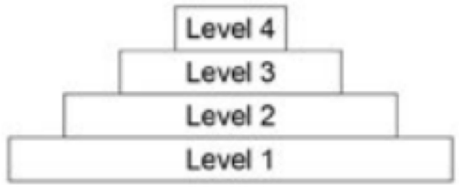
A DECOMPOSITION

1	FACTORS AFFECTING DECAY	Temperature Water Availability of oxygen
2	COMPOST	Natural fertilizer for growing plants / crops.
3	ANAEROBIC DECAY	No oxygen required. Produces methane gas.
4	BIOGAS	Generators produce methane as a fuel.

B ENVIRONMENTAL CHANGE

1	CHANGES	Temperature Availability of water Composition of atmospheric gases
2	AFFECTS	Distribution of species; may be Seasonal Geographic Caused by human interaction.

C TROPHIC LEVELS

1	TROPHIC LEVELS	Level 1; Producers Level 2; Herbivores/ primary consumers Level 3; Carnivores / secondary consumers Level 4; Carnivores / tertiary consumers
		Apex predator; no predators Decomposers; break down dead plants / animals
2	PYRAMID of BIOMASS	Represent relative amount of biomass. 
3	TRANSFER of BIOMASS	Approx. 10% of biomass at each level is transferred to the next.
		Losses due to excretion of waste (e.g.faeces) or glucose used for respiration.

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BIOLOGY– YEAR 11 – ECOLOGY TRIPLE CONTENT

D		FOOD PRODUCTION
1	FOOD SECURITY	Having enough food to feed a population. Biological factors include; increased birth rates Changing diets in developed countries Pathogens / new pests Cost of agricultural inputs Conflicts in parts of the world Environmental changes e.g. low rainfall leading to famine
2	FARMING TECHNIQUES	Efficient food production by reducing energy transfer e.g. restrict movement / control temperature High protein diets for animals.
3	SUSTAINABLE FISHERIES	Fish stocks in the ocean are declining. Control of net size and introduction of fishing quotas
4	BIOTECHNOLOGY	Enable large quantities of microorganisms to be cultured for food. Fusarium fungus used for producing mycoprotein. GM bacterium used to produce human insulin for diabetics. GM crops produce more food / food with higher nutritional value e.g. Golcen Rice.