

Definitions and Concepts for Edexcel Biology IGCSE

Topic 4: Ecology and the Environment

Definitions marked by '' are for separate sciences only*

The Organism in the Environment

Abiotic factors - The non-living aspects of an ecosystem e.g. temperature, light intensity, moisture, wind direction, wind intensity, soil pH, soil mineral content, carbon dioxide levels and oxygen levels.

***Biodiversity** - The variety of living organisms in an ecosystem.

Biotic factors - The living components of an ecosystem e.g. food availability, pathogens, predators and other species.

Community - All the populations of different species living together in a habitat.

Distribution - The spread of living organisms in an ecosystem. It is affected by environmental changes which may be seasonal, geographic or man-made.

Ecosystem - The community of organisms (biotic) and non-living (abiotic) components of an area and their interactions.

Habitat - The place where an organism lives.

Population - All organisms of the same species living with one another in a habitat.

Feeding Relationships

Decomposers - Organisms that release enzymes which catalyse the breakdown of dead plant and animal material into simpler organic matter.

Decomposition - The breakdown of dead materials into simpler organic matter. The rate of decomposition is affected by temperature, water and oxygen availability.

Food chain - Describes the feeding relationships between organisms and the resultant stages of biomass transfer.

Food web - A network of food chains that shows how energy flows through an entire ecosystem.

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Primary consumers - Herbivores that consume producers at trophic level 2 of a food chain.

Producers - Photosynthetic organisms (e.g. green plant or alga) at the start of the food chain that provide biomass for all living things.

Pyramid of biomass - A table of the dry mass of living material at each trophic level of a food chain. This forms the shape of a pyramid.

Pyramid of numbers - A diagram showing the numbers of organisms at each trophic level.

***Quadrat** - A square grid of known area used in sampling to determine the abundance and distribution of organisms in an ecosystem.

Secondary consumers - Carnivores that consume herbivores at trophic level 3 of a food chain.

Tertiary consumers - Carnivores that consume other carnivores at trophic levels 4 and above of a food chain.

Trophic level - The position of an organism in a food chain. Only around 10% of the energy is transferred from one level to the next.

Cycles within Ecosystems

Carbon cycle - The cycle through which carbon (in the form of carbon dioxide) moves between living organisms and the environment, involving respiration, photosynthesis and combustion.

***Decomposers** - Organisms that release enzymes which catalyse the breakdown of dead plant and animal material into simpler organic matter, releasing nitrogen-containing compounds into the soil.

***Denitrifying bacteria** - Bacteria that convert nitrates in the soil into nitrogen gas.

***Nitrifying bacteria** - Bacteria found in the soil that convert ammonia to nitrates.

***Nitrogen cycle** - The cycle through which nitrogen moves between living organisms (producers, consumers and microorganisms) and the environment.

***Nitrogen-fixing bacteria** - Microorganisms responsible for the conversion of atmospheric nitrogen gas into nitrates. They may live in the soil or in the root nodules of plants.



Human Influences on the Environment

Deforestation - The removal of trees from land which is subsequently used to grow crops or provide space for cattle.

Eutrophication - Pollution of water by fertiliser leading to excessive growth of algae at the water surface. This prevents light reaching aquatic plants, causing them to die, and reduces the amount of oxygen available for animal species.

***Evapotranspiration** - The loss of water from trees by evaporation and transpiration. The water vapour condenses in the atmosphere, forming clouds, and returns to the trees by rain.

Global warming - The gradual rise in the average temperature of the Earth due to increasing atmospheric levels of carbon dioxide and methane gas.

Greenhouse gases - Gases in the Earth's atmosphere that trap heat, including water vapour, carbon dioxide, methane, nitrous oxide and chlorofluorocarbons (CFCs).

***Leaching** - The loss of plant nutrients from the soil when fertilisers run off the land into lakes and rivers. This may be due to rain or irrigation and can lead to eutrophication.

Pollution - Contamination or destruction of the natural environment due to human intervention.

