Definitions and Concepts for WJEC (Eduqas) Biology GCSE

Topic 6: Ecosystems

---

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

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

Aerobic decomposition - Organisms break down dead or decaying matter (decompose) in the presence of sufficient oxygen.

Alien species - A species which has been introduced into a new habitat or region that it is not native to, either accidentally or deliberately e.g. for biological control of pests.

Anaerobic decomposition - Organisms carry out decomposition in the absence of oxygen producing carbon dioxide and methane gas. This usually happens in waterlogged soils.

Bacteria - A type of pathogen which is single-celled and prokaryotic (note: not all bacteria are pathogenic).

Biodiversity - The variety and number of different species in an area. ✢

Biomass - The mass of all the living material present in a particular area or particular organism.

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

Capture-recapture - A method of estimating population size. Organisms are captured, marked and then released back into the community. Time is allowed for them to redistribute and another sample is collected. The ratio of marked to unmarked species in the second sample is determined - this is assumed to be proportional to the number of marked to unmarked in the whole population.

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

Carnivore - An organism that feeds on animals.

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

Competition - When different organisms compete for the same resources (e.g. food, shelter and mates) in an ecosystem. It limits population size.

Decomposer - An organism that feeds on dead and decaying matter.

Decomposition - The process of breaking down dead material into simple organic matter. The decomposition rate is influenced by water availability, oxygen availability and temperature.

Detritus - Dead organic material.

Disease - An illness that affects animal or plant health.

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

Endangered species - A species that is at risk from completely dying out.

Efficiency of biomass - The efficiency of biomass transfer between trophic levels is calculated using:

= (Biomass available after transfer / Biomass available before transfer) x 100

Evolution - A gradual change in the population's inherited characteristics over time, by the process of natural selection. This may result in the formation of a new species.

Food chain - Shows the feeding relationships between organisms and the resultant biomass transfer. It follows the structure of:

producer → primary consumer → secondary consumer → tertiary consumer

Food security - Ensuring that populations have access to adequate amounts of safe and nutritious food.

Food web - Shows the relationships between different food chains and how they interact with each other.

Fossil fuel - When fossils are burnt for energy, releasing carbon dioxide into the air.

Fungi - A type of organism which is eukaryotic and can be single-celled or multicellular, e.g. yeast and mushrooms. Fungi can be pathogens.

Genetic modification - Altering the genetic information of an organism.

Herbivore - An organism that feeds on plants.

Indicator species - Species that are used as a reflection of the ecosystem condition.

Interdependence - The dependence of organisms on each other in order to survive, e.g. herbivores rely on plants, birds rely on trees for shelter.

Microorganisms - Very small organisms that are involved in the recycling of materials in an ecosystem. They are able to convert carbon into carbon dioxide which is then released into the atmosphere. They also return mineral ions to the soil.

Natural selection - The process by which advantageous alleles are passed down to offspring over many generations, increasing the allele frequency. These alleles give rise to phenotypes best suited to the environment.

Photosynthesis - An endothermic reaction that takes place in the chloroplasts, converting carbon dioxide and water into glucose and oxygen using light energy. It is a two stage process.

$$6CO_2 + 6H_2O \xrightarrow{\text{Sunlight energy}} C_6H_{12}O_6 + 6O_2$$

Photosynthetic organisms - Organisms that are the main producers of food and therefore biomass for life on earth. For example, green plants and algae.

Population - All the members of the same species that live together in a habitat.

Predation - A biological relationship in which a member of one species consumes a member of another species.

Primary consumer - An organism that cannot produce its own food, so must obtain energy by feeding on the producer. They are herbivores which consume at trophic level two of the food chain.

Producer - An organism that makes its own food and organic materials, usually via photosynthesis.

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

Pyramid of number - A table showing the number of organisms at each trophic level in the food chain. It is not always a pyramid shape; for example, one tree may be the producer for many primary consumers.

Quadrat - A square grid used for sampling a known area to determine the abundance and distribution of organisms.

Respiration - A stage of the carbon cycle where oxygen is used to release energy from glucose. It is shown by the following equation:

$$\text{Glucose} + \text{Oxygen} \rightarrow \text{Carbon Dioxide} + \text{Water}$$

Secondary consumer - An organism that cannot produce its own food so must obtain energy by feeding on the primary consumer. They are carnivores which consume at trophic level three of the food chain.

Sustainability - The ability to maintain something for future generations.

Tertiary consumer - A carnivore that eats other carnivores.

Transect - A line (usually created by a tape measure) along which samples are taken. It is used to measure the abundance and distribution of an organism in an ecosystem.

Trophic level - The position of an organism in the food chain.

Water cycle - The cycle of water moving between the environment and living organisms. It involves precipitation, condensation, transpiration, biomass transfer and evaporation.

✢ Definition taken from: WJEC (Eduqas) GCSE in Biology Specification V.3 January 2019