Definitions and Concepts for CAIE Biology IGCSE

Topic 19: Organisms and Their Environment

*Definitions in **bold** are for supplement only*

Biomass - The total mass of organic material measured in a specific area over a set period.

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

Carnivore - An animal that feeds on other animals.

Carrying Capacity - The maximum population size that an environment can support.

Combustion - The scientific term for the burning of a substance.

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

Consumers - Organisms that feed on other organisms to obtain energy.

Deamination - A process that occurs in the liver in which the amino group is removed from amino acids to produce ammonia, later converted to urea.

Death phase - A period of population reduction in which the mortality rate is greater than the reproduction rate.

Decomposers - Organisms that obtain energy via the breakdown of dead plant and animal material into simpler organic matter.

Decomposition - The breakdown of dead materials into simpler organic matter.

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

Denitrification - The conversion of nitrate ions to nitrogen gas by denitrifying bacteria.

Denitrifying bacteria - Microorganisms responsible for the conversion of nitrate ions to nitrogen gas.

Ecosystem - The community of organisms and non-living components of an area and their interactions.

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

producer ⟶ primary consumer ⟶ secondary consumer ⟶ tertiary consumer

Food web - A diagram showing the interactions of different food chains.

Fossil - The remains of dead organisms found in rocks which are millions of years old.

Fossil fuel - A fuel (e.g. coal, oil, natural gas) formed from the compression of carbon-containing plant or animal remains over millions of years.

Fossilisation - The process by which a fossil is formed.

Herbivore - An animal that feeds on plants.

Ingestion - The process by which organisms take food and drink into their bodies through the mouth. In a food chain, energy is transferred between organisms by ingestion.

Lag phase - A period of slow population growth.

Light energy - The main source of energy input to biological systems that is harnessed from the sun. Light energy is trapped by photosynthetic organisms and converted to chemical energy.

Log phase - A period of rapid population growth, characterised by the birth rate exceeding the death rate. Also known as the exponential phase.

Nitrification - The conversion of ammonium ions to nitrate ions by nitrifying bacteria. This takes place in two stages: ammonium ions are oxidised to nitrite ions; nitrite ions are oxidised to nitrate ions.

Nitrifying bacteria - Microorganisms found in the soil responsible for the conversion of ammonium ions into nitrite and then nitrate ions.

Nitrogen cycle - The cycle through which nitrogen moves between living organisms and the environment, involving four types of bacteria: decomposers, nitrifying bacteria, nitrogen-fixing bacteria and denitrifying bacteria.

Nitrogen fixation - The conversion of atmospheric nitrogen gas into ammonia by nitrogen-fixing bacteria in the soil or root nodules of legumes. It can also occur via lightning.

Nitrogen-fixing bacteria - Microorganisms responsible for the conversion of atmospheric nitrogen gas into nitrogen-containing compounds. They can be free-living or mutualistic.

Over-harvesting - The harvesting of a species (for food, materials etc.) resulting in a reduction in population numbers. This may lead to the species becoming endangered or extinct.

Photosynthesis - A reaction that takes place inside photosynthetic organisms (e.g. plants, algae) and manufactures carbohydrates from raw materials using light energy.

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

Population growth curve - A graphical representation of changing population numbers over time. The curve of a growing population in an environment with limited resources has a sigmoidal shape.

Predators - Consumers that prey on and eat other animals.

Prey - Animals that are eaten by predators.

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

Producers - Photosynthetic organisms (e.g. green plants or algae) 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.

Pyramids of energy - **A diagram which shows the amount of energy within the biomass of organisms at each trophic level.**

Pyramid of numbers - A diagram that shows the number of individual organisms at each trophic level of a food chain.

Quaternary consumers - Carnivores that are at the top of a food chain.

Respiration - A chemical reaction that takes place in cells and produces energy from nutrient molecules.

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

Stationary phase - A period of stability in which population numbers generally remain constant.

Tertiary consumers - Carnivores at trophic level four of a food chain that consume other carnivores.

Trophic level - The position that an organism holds in a food chain, food web, pyramid of numbers or pyramid of biomass.