

Definitions and Concepts for Edexcel (A) Biology A-level

Topic 5 - On the Wild Side

Topic 5 - Climate Change

Anthropogenic climate change: Changes in the climate that are caused by human activity.

Biofuels: Fuels produced using biomass.

Biomass: The dry mass of all of the living organisms in an area.

Causation: When a change in one variable influences another variable.

Conservation: The maintenance of ecosystems and biodiversity by humans in order to preserve the Earth's resources. This typically involves the management of succession.

Correlation: When two data sets show the same trend.

Data extrapolation: The process of predicting unknown data using trends in known datasets which has many applications such as predicting changes in the climate.

Dendrochronology: The use of tree rings to work out data about the tree and its environment which can be useful for analysing changes in climate conditions.

Reforestation: Replanting trees to replenish forests that have been destroyed.

Sustainable resources: Resources which can be continually renewed and used without being depleted.

The carbon cycle: The processes which cycle carbon through the environment, living organisms and the atmosphere.

The greenhouse effect: The increase of global temperatures caused by the trapping of solar heat by gases in the atmosphere.

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

Topic 5 - Energy and ecosystems

Biomass: The dry mass of all of the living organisms in an area.

Biomass transfer efficiency: The proportion of energy transferred between biomass levels - calculated using the following equation:

$$\text{Biomass transfer efficiency} = \frac{\text{Biomass at higher level}}{\text{Biomass at lower level}} \times 100$$

Gross primary productivity: The total amount of energy fixed as chemical energy during photosynthesis carried out by producers.

Net primary productivity: The amount of chemical energy that is available for transfer once the amount of energy loss from respiration is deducted from the total amount of energy - calculated by the following equation:

$$\text{Net primary productivity} = \text{Gross primary productivity} - \text{Energy loss due to respiration}$$

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

Topic 5 - Natural selection, Evolution and Speciation

Allele frequency: The number of times an allele appears within a population's gene pool.

Allopatric speciation: The development of new species over time following the geographic isolation of members of a species.

Evolution: A change in allele frequency over time due to natural selection.

Genomics: The study of the structure and function of the genome.

Greenhouse gas: A gas which contributes to global warming through the greenhouse effect.

Natural selection: The process by which the frequency of beneficial alleles gradually increases in a population's gene pool over time. This theory was developed by Charles Darwin.

Proteomics: The study of the structure and function of the proteome.

Sympatric speciation: The development of a new species over time in the same area as the original species without any geographical isolation.

Topic 5 - Photosynthesis

Calvin cycle: The group of light-independent reactions involved in photosynthesis.

Carbon fixation (Calvin cycle): The addition of CO_2 to RUBP to form an unstable 6 carbon intermediate in the Calvin cycle catalysed by RuBisCO.

Chlorophyll: The main photosynthetic pigment found in chloroplasts which is used to capture energy from photons during photosynthesis.

Chloroplast: An organelle found in plants and algae which is the site of photosynthesis.

Glyceraldehyde-3-phosphate (GALP): The 3 carbon molecule produced by the reduction of GP by NADPH using the energy provided by the hydrolysis of ATP.

Glycerate 3-phosphate (GP): The 3 carbon molecule produced by the spontaneous breakdown of the 6 carbon product of carbon fixation.

Granum: A stack of thylakoids.

Photolysis: The breaking apart of a molecule using light.

Photophosphorylation: The addition of a phosphate group onto a molecule using the energy obtained from sunlight.

Photosynthesis: The process of harnessing the energy from sunlight to split apart the bonds in water molecules and store the hydrogen in organic molecules by combining it with carbon dioxide.

RuBisCO: The enzyme used to fix carbon dioxide in the Calvin cycle.

Stroma: The liquid portion of the chloroplasts where the light-independent reactions of photosynthesis take place.

Thylakoids: Flattened membrane-bound sacs found inside chloroplasts which are the site of the light-dependent reactions of photosynthesis.

Topic 5 - Populations in ecosystems

Abiotic factors: Non-living factors present in the environment which affect ecosystems.

Biotic factors: Living factors present in the environment which affect ecosystems.

Climax community: A community that remains stable and shows little change over time.

Colonisation: The occupation of a new area by a species.

Community: The interactions of different species in the same area.


M E G A
L E C T U R E

Directional selection: A type of selection that favours one extreme phenotype and selects against all other phenotypes.

Ecosystem: The interactions between living organisms and the environment in a given area.

Habitat: The place where an organism lives.

Niche: The position occupied by an organism in its ecosystem.

Pioneer species: The first species to occupy a new area.

Population: Members of the same species that occupy the same area.

Primary succession: The colonisation of previously uninhabited land by a pioneer species.

Secondary succession: The re-colonisation of a habitat after a disturbance.

Succession: A directional change in a community over time.