

## 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  $\text{CO}_2$  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.



**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.

