

# Edexcel (B) Biology A-level

## Topic 3 - Classification and Biodiversity

### Definitions and Concepts

### 3.1 - Classification

**Binomial nomenclature** - A naming system for organisms where the genus and species name are both used to identify an organism.

**Domain** - The highest taxonomic rank in the classification system which includes 3 groups - Bacteria, Archaea and Eukarya.

**Evolution** - A gradual change in allele frequency over time due to natural selection.

**Gel electrophoresis** - A technique used for separating charged molecules based on their size using an electric current.

**Genus** - The taxonomic rank below family but above species and always capitalised when written using binomial nomenclature.

**Kingdom** - The taxonomic rank below domain which typically has 5 groups - Monera, Eukaryota, Fungi, Protista, Plantae and Animalia.

**Peer review process** - A process used to evaluate and assess the validity, reliability and originality of scientific articles before their publication.

**Phylogeny** - The study of evolutionary relationships between organisms.

**Species** - A group of organisms with similar characteristics that interbreed to produce fertile offspring. It is the lowest taxonomic rank which is below genus and is never capitalised when written using binomial nomenclature. †

**Taxonomic rank** - A hierarchy used to group and classify living organisms which typically contains 8 levels - Domain, Kingdom, Phylum, Class, Order, Family, Genus, Species.

**Taxonomy** - The classification of organisms into groups.

### 3.2 - Natural selection

**Adaptation** - The adjustment of an organism's traits which makes it better suited to its environment.

**Allopatric speciation** - The development of new species over time following the geographic isolation of populations of a species.

**Anatomical adaptation** - A favourable change in the structure of an organism which makes it better suited to its environment.

**Behavioural adaptation** - A favourable change in the actions of an organism which increases its chance of survival.

**Evolution** - A gradual change in allele frequency over time due to natural selection.

**Evolutionary arms race** - The race to develop new medicines to treat pathogens before the pathogens acquire adaptations which make them resistant to treatments given.

**Natural selection** - The process which leads to evolution by which organisms with favourable adaptations have a selective advantage and survive to pass on their genes.

**Niche** - The position occupied by an organism in its ecosystem.

**Physiological adaptation** - A favourable change in the bodily/metabolic functions of an organism which makes it better suited to its environment.

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

### **3.3 Biodiversity**

**Alleles** - Different versions of the same gene.

**Conservation** - The maintenance of ecosystems and biodiversity by humans in order to preserve the Earth's resources.

**Ex-situ conservation** - Conservation of organisms away from their natural habitat such as in zoos or seed banks.

**Gene pool** - All of the different versions of genes (alleles) in the individuals that make up a population.

**In-situ conservation** - Conservation of organisms and the surrounding area within their natural habitat using methods such as protected habitats.

**Simpson's index of biodiversity** - A method of measuring biodiversity of an area which takes into account the amount of species which are present and also the abundance of each species which is calculated using the following equation:

$$D = \frac{N(N - 1)}{\sum n(n - 1)}$$