

# WJEC (Eduqas) Biology A-level

## Topic 2.1 - Biodiversity and Classification

### Definitions and Concepts

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**Adaptation** - A feature of an organism that increases its chance of survival in its environment. Adaptations may be anatomical, physiological or behavioural.

**Anatomical adaptations** - Changes to the physical features of an organism that increase its chance of survival in its environment.

**Animalia** - A biological kingdom consisting of multicellular, heterotrophic eukaryotes that do not have a cell wall.

**Archaea** - One of the three domains made up of primitive bacteria existing in extreme environments, e.g. extremophile prokaryotes.

**Bacteria** - One of the three domains that consists of true bacteria.

**Behavioural adaptations** - The ways in which an organism acts differently to increase its chance of survival in its environment.

**Binomial system** - The universal system of naming organisms using their genus and species.

**Biodiversity** - The number and variety of living organisms in a given region. It is affected by environmental, genetic and human factors.

**Classification** - The organisation of organisms into groups.

**DNA profiling** - A method of determining the characteristics of an individual's DNA. The percentage of DNA or proteins shared by organisms can be used to estimate relatedness.

**DNA sequencing** - Determining the entire DNA nucleotide base sequence of an organism. Comparisons between members of the same species can identify variation in base sequences and hence estimate genetic diversity.

**Domain** - The highest taxonomic rank. There are three domains; Archaea, Bacteria and Eukaryota.

**Eukarya** - One of the three domains that consists of all eukaryotic organisms.

**Five kingdom classification system** - The classification of organisms into five major kingdoms: Animalia, Fungi, Plantae, Prokaryotae and Protoctista.

**Fungi** - A biological kingdom consisting of heterotrophic eukaryotes that have chitin cell walls and reproduce asexually by producing spores.

**Genetic biodiversity** - A measure of the variety of genes that make up a species. It can be assessed by determining the proportion of the population that possess a certain allele or the number of alleles at a locus.

**Kingdom** - The second highest taxonomic rank. There are five kingdoms: Animalia, Fungi, Plantae, Prokaryotae and Protoctista.



**Linnaean system** - The classification of organisms into kingdom, phylum, class, order, family, genus and species.

**Morphological convergence** - The independent evolution of analogous features in unrelated organisms due to exposure to similar environments or selection pressures.

**Natural selection** - The process by which the frequency of 'advantageous' alleles gradually increases in a population's gene pool over time.

**Physiological adaptations** - The internal body changes that an organism undergoes to increase its chance of survival in its environment.

**Plantae** - A biological kingdom consisting of multicellular eukaryotes that have a cellulose cell wall and can photosynthesise.

**Prokaryotae** - A biological kingdom consisting of unicellular prokaryotes which lack a true nucleus and membrane-bound organelles.

**Proportion of polymorphic gene loci** - A measure of genetic biodiversity. Calculated using:

$$\text{proportion of polymorphic gene loci} = \frac{\text{number of polymorphic gene loci}}{\text{total number of loci}}$$

**Protocista** - A biological kingdom consisting of unicellular eukaryotes.

**Simpson's Index of Diversity (D)** - A measurement of diversity that considers both species richness and evenness. A value between 0 and 1 is found and the greater the value, the greater the diversity. Calculated using the formula:

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

**Species** - A group of similar organisms that are able to breed with one another to produce living, fertile offspring.

**Species evenness** - The number of individuals of each species living together in a community.

**Species richness** - The number of different species found within an area.

**Taxonomic hierarchy** - The arrangement of organisms into successive levels of classification known as taxonomic groups.

**Three-domain system** - A method of classification in which organisms are categorised into three groups; Archaea, Bacteria and Eukaryota.



