Definitions and Concepts for OCR (A) Biology GCSE

Topic 5: Genes, Inheritance and Selection

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*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

***Active site - The part of the enzyme which is specific to the substrate and has a complementary shape to it.**

Allele - A version of a gene (also known as variant).

Antibiotic - A type of medication that helps cure bacterial disease by killing infective bacteria inside the body.

Antibiotic resistance - The ability of a bacteria to become resistant to the treatment that is being used to kill it, i.e. antibiotics. This provides evidence for evolution.

Artificial classification - The classification of organisms based on observable characteristics.

***Asexual reproduction** - A form of reproduction that only involves a single parent and creates genetically identical offspring.

***Biodiversity** - The variety of different organisms living in an ecosystem.

Chromosome - A long, coiled molecule of DNA that carries genetic information in the form of genes.

Continuous variation - Variation that can take any value between two extremes, e.g. height or weight.

DNA (deoxyribonucleic acid) - A polymer that is made of two strands twisted around each other forming a double helix. It contains all the genetic information.

Diploid - When a cell has a full set of chromosomes.

Discontinuous variation - Variation that can only take discrete values, e.g. eye colour.

Dominant - An allele that is always expressed when present. It is represented by a capital letter.

***Enzymes - Biological catalysts that increase the rate of chemical reactions.**

Evolution - A change in the inherited characteristics of a population over time, through the process of natural selection, which may result in the formation of new species. ✢

Extinction - When all the members of a species have died.

Fossil record - The remains or impressions of dead organisms found in rocks that are millions of years old. They provide evidence for evolution.

Gamete - Sex cells (sperm and egg cells) with half the usual number of chromosomes. They are involved in reproduction.

Gene - A section of DNA that codes for a specific amino acid sequence which is polymerised to make a specific protein.

Genetic variation - The variation in the genes of a species.

Genome - The entire genetic material of an organism. ✢

Genotype - The genetic makeup of an organism.

Haploid - When a cell has half the number of chromosomes.

Heterozygous - When an individual has two non-identical alleles of a gene e.g. Bb.

Homozygous - When an individual has two identical alleles of a gene e.g. bb.

Meiosis - A form of cell division that produces gametes. They are not genetically identical and contain half the number of chromosomes.

***Messenger RNA (mRNA)** **- An RNA subtype that carries genetic information from the nucleus to the ribosomes during protein synthesis.**

Molecular phylogenetics - Finding evolutionary relationships between organisms on the basis of their DNA. This method can only be used in fossils that have DNA present.

Mutation - A random change in DNA which increases variation. They may have a neutral, beneficial or damaging effect on the phenotype.

Natural classification - The classification of organisms based on their evolutionary relationships.

Natural selection - The process by which advantageous alleles are passed down to offspring over many generations, increasing the allele frequency. These alleles give rise to phenotypes best suited to the environment.

Nucleus - An organelle found in most eukaryotic cells that contains the cell's genetic material and controls the activities of the cell.

Phenotype - The physical characteristics of an organism. It is due to interactions between the genotype and the environment.

Punnett square - A grid used to determine potential outcomes of a genetic cross.

Recessive - An allele that is only expressed if two copies are present. It is represented by a small letter.

***Seedbank** - A place where seeds are preserved in order to preserve genetic diversity.

***Sexual reproduction** - Reproduction that involves the fusion of male and female gametes. This method of reproduction produces genetic variation.

Single gene inheritance - Inheritance of characteristics that are controlled by a single gene.

***Speciation** - The formation of new species due to the evolution of two reproductively separated populations. This is usually due to geographic isolation.

***Transcription** **- The unzipping of the DNA molecule around the gene, copying it to mRNA in the nucleus. ✢**

***Translation** **- Translating the mRNA sequence to an amino acid sequence during protein synthesis.**

✢ Definition taken from: OCR Gateway Science Biology A Specification (J247) V3.1 (July 2020)