



# Definitions and Concepts for AQA Biology GCSE

## Topic 6: Inheritance, Variation and Evolution

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

*Definitions marked by '\*\*' are for separate sciences only*

**\*Adult cell cloning:** A type of cloning that forms an embryo from an adult body cell.

**Allele:** A version of a gene.

**Amino acids:** Small molecules from which proteins are assembled.

**Archaea:** Primitive bacteria existing in extreme environments.

**Asexual reproduction:** A form of reproduction involving a single parent. Creates genetically identical offspring.

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

**Charles Darwin:** The scientist who developed the theory of evolution by natural selection.

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

**Classification:** The organisation of organisms into groups based on their characteristics and structure.

**\*Coding DNA:** A sequence of DNA that codes for the production of a protein.

**\*Complementary:** Describes how the chemical bases in DNA pair up with each other. A pairs with T and C pairs with G.

**\*Cuttings:** The simplest method of cloning plants. A branch is cut from a parent plant and replanted in compost after removing the lower leaves.



**Cystic fibrosis:** A cellular membrane disorder resulting from the presence of a recessive allele.

**DNA:** A double-stranded polymer wound to form a double helix. Carries the genetic code.

**Dominant:** Describes an allele that is always expressed. Represented by a capital letter.

**Embryo screening:** A procedure used to determine the presence of faulty genes in an embryo produced by IVF. A few embryonic cells are removed and screened for defective alleles.

**\*Embryo transplants:** The simplest method of animal cloning. Cells are removed from a developing embryo, split apart and grown in culture, before being transplanted into host mothers.

**Evolution:** The gradual change in the inherited traits within a population over time. Occurs due to natural selection.

**Evolutionary tree:** A diagram which illustrates the evolutionary relationships between organisms.

**Extinction:** The death of all members of a species.

**Family tree:** A chart used to show the inheritance of a condition in a family.

**Fertilisation:** The fusion of the nucleus of male and female gametes. Restores the full chromosome number.

**Fossil:** The remains of dead organisms found in rocks which are millions of years old.

**Gametes:** Sex cells (sperm and egg cells) with half the usual number of chromosomes.

**Gene:** A section of DNA that codes for a specific sequence of amino acids which undergo polymerisation to form a protein.

**Genetic engineering:** The modification of the genome of an organism by the insertion of a desired gene from another organism, enabling the formation of organisms with beneficial characteristics.

**Genome:** The complete genetic material of an organism.

**Genotype:** An organism's genetic composition. Describes all alleles.

**GM crops:** Crops that have had their genomes modified by the insertion of a desired gene from another organism.

**Heterozygous:** When someone has two different alleles of a gene e.g. Ff.



**Homozygous:** When someone has two identical alleles of a gene e.g. ff.

**Inbreeding:** The formation of offspring from the breeding of closely related individuals.

**Linnaean system:** The classification of organisms into kingdom, phylum, class, order, family, genus and species, as developed by Carl Linnaeus.

**Meiosis:** A form of cell division that produces gametes, non-identical cells with half the usual number of chromosomes.

**Mitosis:** A form of cell division that produces two genetically identical daughter cells (with a full set of chromosomes) from one parent cell.

**MRSA:** A type of bacteria that is resistant to the antibiotic, methicillin.

**Mutation:** A random change in DNA which may result in genetic variants.

**Natural selection:** The process by which the frequency of advantageous traits passed on in genes gradually increases in a population over time.

**\*Non-coding DNA: DNA which does not code for a protein but instead controls gene expression.**

**\*Nucleotide:** The monomers of DNA consisting of a common sugar, a phosphate group and one of four chemical bases (A, T, C, G) attached to the sugar.

**Phenotype:** An organism's observable characteristics. Due to interactions of the genotype and the environment.

**Polydactyly:** A condition where an individual is born with extra fingers or toes due to the presence of a dominant allele.

**\*Protein synthesis: The formation of a protein from a gene.**

**Punnett square:** A grid used to predict the potential outcomes of a genetic cross.

**Recessive:** Describes an allele that is only expressed in the absence of a dominant allele. Represented by a small letter.

**Ribosomes:** Sub-cellular structures where protein synthesis takes place.

**Selective breeding:** The process by which humans artificially select organisms with desirable characteristics and breed them to produce offspring with desirable phenotypes.

**Sex chromosomes:** A pair of chromosomes responsible for the determination of gender. XY in males. XX in females.



**Sexual reproduction:** A form of reproduction involving the fusion of male and female gametes. Creates genetic variation.

**\*Speciation:** The formation of new species in the course of evolution, often due to the evolution of two isolated populations.

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

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

**\*Tissue culture:** A method of growing living tissue or cells in a suitable medium to produce clone plants.

**Variation:** The differences between individuals due to genes, the environment or a combination of both.

**Vector:** A carrier used to transfer a gene from one organism to another.