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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.

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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.


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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.**

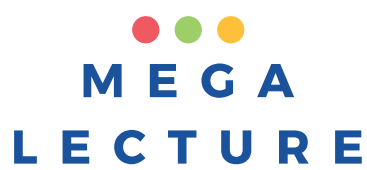
Punnett square: A grid used to predict the potential outcomes of a genetic cross.

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.


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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.