

## Definitions and Concepts for CAIE Biology IGCSE

### Topic 17: Inheritance

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Definitions in **bold** are for supplement only

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

**Blood group** - Classification of blood type as A, B, AB or O based on surface antigens on red blood cells and the presence of certain antibodies in the plasma. Blood group is controlled by three alleles,  $I^A$ ,  $I^B$  and  $I^O$ .

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

**Codominance** - When both alleles for a gene in a heterozygous organism equally contribute to the phenotype.

**Colour blindness** - An X-linked recessive condition characterised by the inability to distinguish between colours. It is more common among males because they only inherit one X chromosome.

**Diploid cell** - A cell that contains a pair of each chromosome type e.g. human diploid cell has 23 pairs of chromosomes.

**Diploid nucleus** - A nucleus that contains two copies of each chromosome (i.e. a full set of chromosomes).

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

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

**Gene** - A length of DNA on a chromosome that codes for the production of a specific protein.

**Gene expression** - All specialised cells contain the same set of genes, but only the genes required to code for certain proteins are switched on in any given cell.

**Genetic code** - The rules by which the sequence of bases in a gene codes for the sequence of amino acids in a specific protein.

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

**Haploid nucleus** - A nucleus that contains a single copy of each chromosome (i.e. half the number of chromosomes)

**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.

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**Inheritance** - The transmission of genetic information from one generation to the next.

**Meiosis** - A form of nuclear division that produces four genetically different daughter cells (gametes). **It involves two divisions. Chromosome number is halved, resulting in haploid cells.**

**Mitosis** - A form of nuclear division that produces two genetically identical daughter cells from one parent cell. **The copies of chromosomes are separated, maintaining the diploid chromosome number.** Mitosis is important in the growth, repair and replacement of cells, as well as asexual reproduction.

**Monohybrid inheritance** - The inheritance of a single gene.

**mRNA** - **A polymer of nucleotides that carries genetic information from the nucleus to the ribosomes during protein synthesis.**

**Pedigree diagram** - A chart used to show the inheritance of a given characteristic in a family.

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

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

**Pure breeding** - A type of breeding in which all of the offspring carry the same phenotype as the parents. This occurs when two identical homozygous individuals are crossed.

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

**Ribosomes** - **Sub-cellular structures that are the site of protein synthesis.**

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

**Sex-linked characteristic** - **A characteristic that is coded for by an allele found on a sex chromosome.**

**Stem cells** - **Cells that are unspecialised and capable of dividing by mitosis to produce a range of different cell types.**

**Test cross** - **An individual with a dominant phenotype is crossed with a homozygous recessive individual. The ratio of offspring indicates the genotype of the dominant individual.**

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

