

# Inheritance

## Inheritance:

The process of passing genetic information from one generation to the next, encoded in DNA within chromosomes in the cell nucleus.

## Key Definitions:

- Chromosome: A thread-like structure of DNA.
- Gene: A length of DNA that codes for a specific protein.
- Allele: A variation of a gene.

## Sex Inheritance:

- Males: XY chromosomes.
- Females: XX chromosomes.

## DNA Structure & Function:

- DNA controls cell functions by directing protein production.
- It has a double helix structure with base pairs: Adenine-Thymine, Cytosine-Guanine.

## Protein Manufacture:

Sourced from: <https://freeexamacademy.com>  
DNA sequence (gene) is copied into mRNA in the nucleus, which is translated into proteins by ribosomes in the cytoplasm.

## Cell Division:

- Mitosis: Produces genetically identical diploid cells for growth and repair.
- Meiosis: Produces genetically different haploid cells (gametes) with half the chromosome number.

## **Monohybrid Inheritance:**

- Genotype: Genetic makeup.
- Phenotype: Observable traits.
- Homozygous: Two identical alleles.
- Heterozygous: Two different alleles.
- Dominant allele: Always expressed if present.
- Recessive allele: Only expressed when no dominant allele is present.

## **Examples:**

- Brown eye allele (B) is dominant; blue eye allele (b) is recessive.
- Monohybrid crosses predict offspring traits using Punnett squares.

## **Co-Dominance:**

When both alleles affect the phenotype (e.g., blood types: IA, IB, and IO).

## **Sex-linked Characteristics:**

Traits linked to genes on sex chromosomes (e.g., red-green color blindness, more common in males due to a defective X chromosome).

<https://accorm.ginastic.co>

Sourced from: <https://freeexamacademy.com>