

Genetics

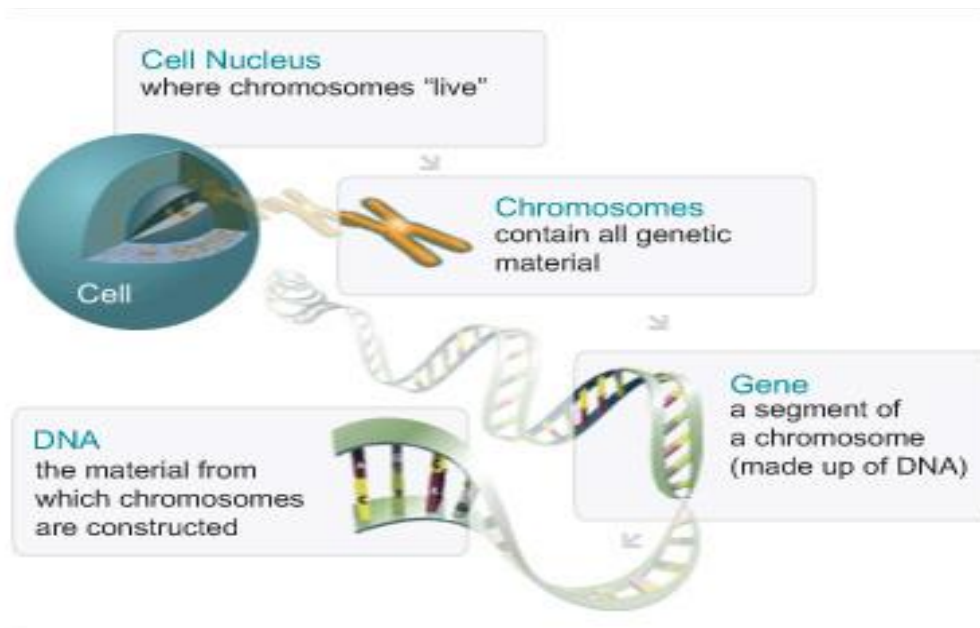
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- **What is genetics?**

- “Genetics is the study of **heredity**, the process in which a parent passes certain **genes** onto their children.”
- What does that mean?
 - Children **inherit** their biological parents’ genes that express specific **traits**, such as some physical characteristics, natural talents, and genetic disorders.



Heredity

- describes how some traits are passed from parents to their children.
- The traits are expressed by genes, which are small sections of DNA that are coded for specific traits.
- Genes are found on chromosomes.
- Humans have two sets of 23 chromosomes—one set from each parent.

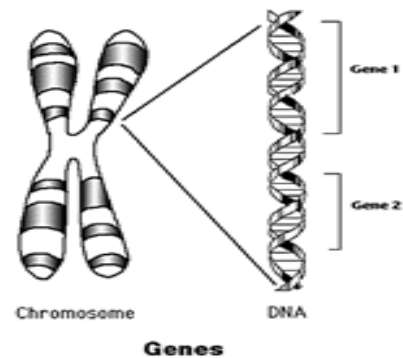
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Genetic Information

- **Gene** - basic unit of genetic information. Genes determine the inherited characters.
- **Genome** - the collection of genetic information.
- **Chromosomes** - storage units of genes.
- **DNA** - is a nucleic acid that contains the genetic instructions specifying the biological development of all cellular forms of life



Genes

- Heritable units of information about traits
- Parents transmit genes to offspring
- Each gene has a specific **locus** on a chromosome

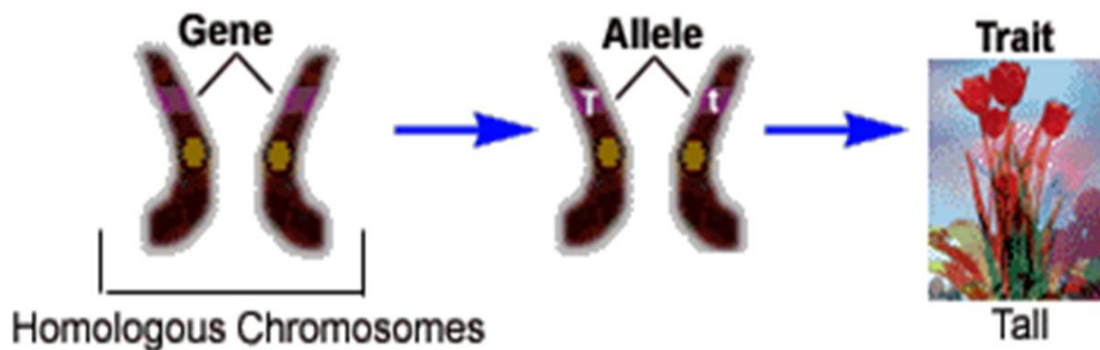
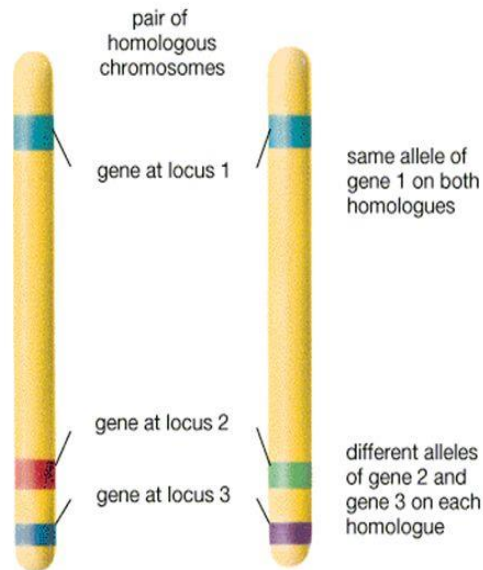
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Homologous Chromosomes, Genes, and Alleles

- Chromosome pair:
 - “homologous chromosomes”
- pair has genes at the same loci
 - “alleles”
 - may be the same or different



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Alleles and Loci

An **allele** is a gene that has more than one form. Each of the forms is referred to as an allele. For example, the gene for red flowers and the gene for white flowers are two different alleles.

A **locus** (plural: **loci**) is the location of a gene on a chromosome.

- The gene for red flowers and the gene for white flowers are two different alleles at the same locus.

-A single chromosome can have a gene for white flowers or a gene for red flowers but not both.

-There are two **loci** illustrated below, one is for flower color and the other is for stem length. Flower color has five **alleles** and stem length has two.

