

Beginning Genetic Terms

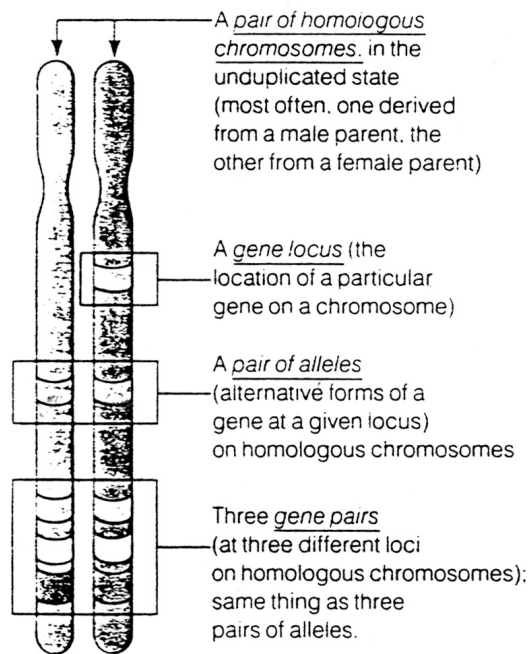


Figure 12.3 A few genetic terms illustrated. In Mendel's time, no one knew about meiosis or chromosomes, but it was clear that offspring received hereditary material from parents by way of sperm and eggs. As we now know, the hereditary material (genes) is packaged in homologous chromosomes (one from the male, one from the female parent). Thus at each gene locus along the chromosomes, one allele has come from the male parent and its partner has come from the female parent.

1. Distinct units of heredity—**genes**—are the physical basis for all traits of an individual.
2. Each gene has its own **locus**, a particular location on a chromosome.
3. A gene may occur in one of two or more alternative forms, known as **alleles**.
4. Diploid organisms have two alleles for each trait, on two partner chromosomes (the homologues derived from two parents).
5. The two alleles of a pair may be identical or different. (For instance, both alleles for flower color may specify white. Or one may specify white and the other may specify purple, pink, or some other color.)
6. If the two alleles of a pair are identical, the individual is a **homozygote** for the trait. If they are not identical, the individual is a **heterozygote** for the trait.
7. Often one allele of a pair can mask expression of its partner. It is a **dominant allele**, and the other is a **recessive allele**. Dominant alleles are indicated by capital letters and recessive alleles by lowercase letters (for example, *A* and *a*).
8. A **homozygous dominant** individual has inherited two dominant alleles for the trait (*AA*). A **homozygous recessive** individual has inherited two recessive alleles for the trait (*aa*), and a **heterozygous** individual has two different alleles (*Aa*).
9. The genetic makeup of an individual is called its **genotype**. The term can refer to the sum total of the individual's genes or to one pair of alleles at a time.
10. The term **phenotype** refers to an individual's observable traits (its structure, physiology, and behavior).