KEY CONCEPT

Genes encode proteins that produce a diverse range of traits.



The same gene can have many versions.

- A gene is a piece of DNA that directs a cell to make a certain protein.
- Each gene has a locus, a specific position on a pair of homologous chromosomes.



6.4 Traits, Genes, and Alleles

- An allele is any alternative form of a gene occurring at a specific locus on a chromosome.
 - Each parent donates one allele for every gene.
 - Homozygous describes two alleles that are the same at a specific locus.
 - Heterozygous describes two alleles that are different at a specific locus.



Genes influence the development of traits.

• All of an organism's genetic material is called the genome.

- A genotype refers to the makeup of a specific set of genes.
- A phenotype is the physical expression of a trait.

6.4 Traits, Genes, and Alleles

- Alleles can be represented using letters.
 - A dominant allele is expressed as a phenotype when at least one allele is dominant.
 - A recessive allele is expressed as a phenotype only when two copies are present.
 - Dominant alleles are represented by uppercase letters; recessive alleles by lowercase letters.



6.4 Traits, Genes, and Alleles

- Both homozygous dominant and heterozygous genotypes yield a dominant phenotype.
- Most traits occur in a range and do not follow simple dominant-recessive patterns.

