



SECTION
7.2

COMPLEX PATTERNS OF INHERITANCE
Reinforcement

KEY CONCEPT Phenotype is affected by many different factors.

Although some genetic traits are produced by one gene with dominant and recessive alleles, most genetic traits are the result of more complex relationships among genes and alleles. In many cases phenotype comes from more than just one gene, and many genes have more than just two alleles.

- **Incomplete dominance:** In incomplete dominance, neither of two alleles is completely dominant or completely recessive. Instead, the alleles show **incomplete dominance**, where the heterozygous phenotype is somewhere between the homozygous dominant and homozygous recessive phenotypes. The heterozygous phenotype is a third, distinct phenotype.
- **Codominance:** In **codominance**, two alleles of a gene are completely and separately expressed, and both phenotypes are also completely expressed. Human blood type is an example of both codominance and a multiple allele trait. The alleles for blood types A and B are codominant, which can be expressed as an AB blood type. The allele for type O blood is recessive to the other two alleles.
- **Polygenic traits:** Traits that are produced by two or more genes are **polygenic traits**. Because many different gene interactions can occur with polygenic traits, these traits often have a wide, continuous range of phenotypes.
- **Epistasis:** An epistatic gene is a gene that can affect the expression of all of the other genes that affect a trait.

The environment can influence gene expression, which then affects phenotype. Human height is a trait that is partially due to environment. Another example is how temperature affects sex determination of sea turtles.

1. What is incomplete dominance?

2. What is codominance?

3. What is a polygenic trait?

4. Describe what happens in epistasis.

5. Give an example of how genotype and the environment can interact.
