Section 7.2 Complex Patterns of Inheritance
Read pages 204-207 in your textbook.

Objectives

- Describe different types of allele interactions.
- Describe polygenic traits and the effect of environmental factors on phenotype.

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. See examples below…

1. 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. For example, a royal blue betta fish is heterozygous for the green and blue color alleles.

2. 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.

3. 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. For example, at least three different genes interact to produce the range of human eye colors.

4. In **epistasis**, one gene suppresses the effect of another. An **epistatic gene** is a gene that can affect the expression of all of the other genes that affect a trait. For example, albinism in mammals is caused by an epistatic gene that blocks the production of pigments.

1. What is incomplete dominance?
2. What is codominance?
3. What is a polygenic trait?
5. Give an example of how genotype and the environment can interact.