



**FIGURE 18**  
**Mutations in Genes**  
 The illustration shows three types of mutations that can occur in genes. **Comparing and Contrasting** How are these mutations different from the mutations that occur when chromosomes do not separate during meiosis?

## Mutations

Suppose that a mistake occurred in one gene of a chromosome. Instead of the base A, for example, the DNA molecule might have the base G. Such a mistake is one type of mutation that can occur in a cell's hereditary material. Recall that a mutation is any change in a gene or chromosome. **Mutations can cause a cell to produce an incorrect protein during protein synthesis. As a result, the organism's trait, or phenotype, may be different from what it normally would have been.** In fact, the term *mutation* comes from a Latin word that means "change."

If a mutation occurs in a body cell, such as a skin cell, the mutation will not be passed on to the organism's offspring. If, however, a mutation occurs in a sex cell, the mutation can be passed on to an offspring and affect the offspring's phenotype.

**Types of Mutations** Some mutations are the result of small changes in an organism's hereditary material. For example, a single base may be substituted for another, or one or more bases may be removed from a section of DNA. This type of mutation can occur during the DNA replication process. Other mutations may occur when chromosomes don't separate correctly during meiosis. When this type of mutation occurs, a cell can end up with too many or too few chromosomes. The cell could also end up with extra segments of chromosomes.

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