

Biology Chapter 17

Answer Key

17.1 Assessment

- 1a. A gene pool consists of all the genes, including all the different alleles for each gene that are present in a population. The allele frequency is the number of times that the allele occurs in a gene pool, compared with the number of times other alleles for the same gene occur.
- 1b. Change in the relative frequency of alleles in the population's gene pool over time.
- 1c. The frequency would probably decrease.
- 2a. Mutations, genetic recombination in sexual reproduction, and lateral gene transfer
- 2b. Gene shuffling results in different combinations of genes and alleles through independent assortment and crossing over.
- 2c. Sexual reproduction combines alleles from different parents to produce offspring with different genotypes than the parents. Asexual reproduction produces offspring with the same genotype as the parent.
- 3a. A single-gene trait is a trait controlled by only one gene. A polygenic trait is a trait controlled by two or more genes.
- 3b. Single-gene traits have just a few distinct phenotypes. Polygenic traits have many possible phenotypes, which often are not clearly distinct from one another.
- 3c. It is probably a single-gene trait because it has two distinct phenotypes. If it were a polygenic trait, the offspring's coat color would have more variation.

17.1 End of Chapter

1. a
2. c
3. b
4. Allele frequency is the number of times an allele occurs in a gene pool, compared with the total number of times all alleles for the same gene occur. For example, in a mouse population, the allele frequency of the allele for black fur might be 40 percent, compared to allele frequency of 60 percent for the allele for brown fur color.
5. Each chromosome in a pair moves independently during meiosis, producing millions of possible gene combinations in gametes. Crossing-over creates an even greater number of possible gene combinations.