Section 19.2: Review Answers

Student Textbook page 697

1. The table should have a table number and caption, and should be defined by straight lines. An example is given below.

Conditions	Outcome
population size is large	■ genetic drift ■ reduced genetic diversity
random mating occurs	■ selection ■ changes in allele frequency
no mutations	■ genetic drift ■ changes in allele frequency
no migration	■ increased genetic diversity within population ■ reduced genetic diversity between populations
no natural selection	■ changes in allele frequency ■ microevolution

Sample caption: Table 1. The conditions required for genetic equilibrium to exist, and what happens if these conditions are not met.

2. Mutations lead to increased genetic diversity and may be useful when the environment changes, or when new environments are colonized. Some mutations will result in increased fitness, and some will take predation pressure off other individuals.

3. Decreased genetic diversity in the population they come from, and increased genetic diversity in the population they are going to would result. If the migrants establish a new population, they will contribute all the genetic diversity of the new population.

4. In the founder effect, a small subset of the original population emigrates to a new habitat. The bottleneck effect describes the situation that occurs when a large population crashes, and a small subset of the original population re-establishes the population. The two effects are similar in that they both involve a small population with limited genetic diversity, resulting in a new population that is different from the original population and has a gene pool of low genetic diversity. The two effects differ as follows: the founder effect involves colonizing a new habitat, but the bottleneck effect occurs in the original population; the founder effect retains the original population, resulting in two populations, while the bottleneck effect modifies the original population and only one population results; and the founder effect may lead to the creation of two species, thereby increasing biodiversity, while the bottleneck effect will result in a single new species.