

Questions

p. 137

- 1a The relationship between a gene, a DNA molecule, and a protein is that a gene is the part of a DNA molecule that codes for a certain protein.
- 1b A DNA molecule determines the structure of a specific protein because the sequence of bases on the DNA molecule codes for the sequence of bases on messenger RNA, which codes for the sequence of amino acids in a protein.
- 1c This same base sequence could not code for a different amino acid because each three-letter code specifies one type of amino acid.
- 2a The sequence of events that happen during protein synthesis are: RNA is produced using a strand of DNA as a pattern and moves into the cytoplasm where it attaches to a ribosome; then each three-letter code of bases in the messenger RNA is matched to the transfer RNA that carries the specified amino acid. The amino acids are attached in a correct sequence to form a protein molecule.
- 2b Messenger RNA is the material that copies the coded message from the DNA in the nucleus and carries the message to the ribosomes in the cytoplasm.
- 2c Transfer RNA performs its function in the cytoplasm; it carries amino acids to the ribosomes and "reads" the messenger RNA.

3a. A mutation in a gene affects the order of DNA bases in that a base may be substituted for another; one or more bases may be removed; or may be added.

3b. A mutation in a gene may cause a change in an organism's phenotype in that the phenotype of the organism will be different as a result of the incorrect protein.