

## CHAPTER

10

## SCIENCE SKILLS: INTERPRETING TABLES

## How Proteins Are Made

Use the table below to complete items 1–3.

| First base | Second base         |                 |                     |                    | Third base       |
|------------|---------------------|-----------------|---------------------|--------------------|------------------|
|            | U                   | C               | A                   | G                  |                  |
| U          | UUU ] Phenylalanine | UCU ] Serine    | UAU ] Tyrosine      | UGU ] Cysteine     | U<br>C<br>A<br>G |
|            | UUC ]               | UCC ]           | UAC ]               | UGC ]              |                  |
|            | UUA ] Leucine       | UCA ]           | UAA ] Stop          | UGA ] - Stop       |                  |
|            | UUG ]               | UCG ]           | UAG ]               | UGG ] - Tryptophan |                  |
| C          | CUU ] Leucine       | CCU ] Proline   | CAU ] Histidine     | CGU ] Arginine     | U<br>C<br>A<br>G |
|            | CUC ]               | CCC ]           | CAC ]               | CGC ]              |                  |
|            | CUA ]               | CCA ]           | CAA ] Glutamine     | CGA ]              |                  |
|            | CUG ]               | CCG ]           | CAG ]               | CGG ]              |                  |
| A          | AUU ] Isoleucine    | ACU ] Threonine | AAU ] Asparagine    | AGU ] Serine       | U<br>C<br>A<br>G |
|            | AUC ]               | ACC ]           | AAC ]               | AGC ]              |                  |
|            | AUA ]               | ACA ]           | AAA ] Lysine        | AGA ] Arginine     |                  |
|            | AUG ] - Start       | ACG ]           | AAG ]               | AGG ]              |                  |
| G          | GUU ] Valine        | GCU ] Alanine   | GAU ] Aspartic acid | GGU ] Glycine      | U<br>C<br>A<br>G |
|            | GUC ]               | GCC ]           | GAC ]               | GGC ]              |                  |
|            | GUA ]               | GCA ]           | GAA ] Glutamic acid | GGA ]              |                  |
|            | GUG ]               | GCG ]           | GAG ]               | GGG ]              |                  |

1. Complete the table below showing sequences of DNA, mRNA codons, anti-codons, and corresponding amino acids. Use the list of mRNA codons in the table above to assist you in completing this exercise. Remember that the genetic code is based on mRNA codons.

|            |            |          |          |          |
|------------|------------|----------|----------|----------|
| DNA        | a. _____   | b. _____ | GAT      | c. _____ |
| mRNA codon | d. _____   | e. _____ | f. _____ | UAU      |
| Anticodon  | g. _____   | UUC      | h. _____ | i. _____ |
| Amino acid | Tryptophan | j. _____ | k. _____ | l. _____ |

(continued on next page)

2. Determine how the mutations below will affect each amino acid sequence. Use the mRNA codons in the table on page 19 to complete items a-d below. In the space provided, write the names of the amino acids that correspond to each mRNA sequence and mutation given. An example is provided for you.

**Example:**

|                    |             |                   |
|--------------------|-------------|-------------------|
| mRNA sequence:     | UGU-CCG     | cysteine-proline  |
| mutation sequence: | UGC-CGC     | cysteine-arginine |
| a. mRNA sequence:  | GAA-CGU     | _____             |
| mutation sequence: | GAU-CGU     | _____             |
| b. mRNA sequence:  | AUC-UGC     | _____             |
| mutation sequence: | AUC-UGG     | _____             |
| c. mRNA sequence:  | UGU-CCU-CCU | _____             |
| mutation sequence: | UGU-UUC-CCU | _____             |
| d. mRNA sequence:  | GGG-UUA-ACC | _____             |
| mutation sequence: | GGU-UAA     | _____             |

3. What kind of mutation occurred to the mRNA sequence in item d above? Explain.

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