Life Science (Grades 9–12)

Subtest 1 Sample Items

1. In biology, computer models would be most helpful for exploring which of the following phenomena?

A. the life cycles of ferns and mosses
B. the evolution of analogous structures in different phyla
C. the nutritional requirements of a bacterial strain
D. the interactions of biotic and abiotic factors in an ecosystem

2. Before students in a life science class read a new chapter in their textbook, the teacher writes three to four statements on the board related to key concepts addressed in the chapter (e.g., "Limiting factors prevent a population from increasing in size indefinitely"). The teacher gives students ten minutes to discuss the statements with a partner and try to think of evidence that would support each statement. Afterward, partners share their ideas in a whole-class discussion. These prereading activities help promote students' comprehension of the chapter primarily in which of the following ways?

A. by guiding the students to adjust their reading rate to match the difficulty level of the text
B. by providing the students with a strategy for distinguishing facts from opinions in the text
C. by showing the students how to use visualization to construct meaning as they read the text
D. by activating and building the students' background knowledge related to the text

3. In a protein molecule, interactions between the molecule's side chains are responsible for the protein's:

A. primary structure.
B. secondary structure.
C. tertiary structure.
D. quaternary structure.

4. Which of the following types of mutations is depicted in the diagram below?

$$^{3'}\text{A T G G T C A T } \color{red}{G} \color{black}{\text{ C C T A G T }}^{5'}$$

$$^{5'}\text{T A C C A G T A } \color{red}{T} \color{black}{\text{ G G A T C A }}^{3'}$$

A. aneuploidy
B. missense mutation
C. gene deletion
D. frameshift mutation

5. In the process of cloning a human gene, the cloning vector is typically:

A. a strand of bacterial RNA.
B. an *E. coli* cell.
C. an isolated bacterial plasmid.
D. a nucleic acid probe.

Answer Key

Item Number	Correct Response	Subarea	Objective
1	D	I. Life Science Research and Applications	0002
2	D	I. Life Science Research and Applications	0003
3	C	II. Molecular and Cellular Life Processes	0006
4	B	III. Molecular Reproduction and Heredity	0009
5	C	III. Molecular Reproduction and Heredity	0010

⬆Top of Page