

Biology Practice Test
Fall 2020

The information for each item, including the objective, DOK level, item type, and correct answer, is located in this document. The items appear in the order as shown in the table.

Item Number	Objective	DOK Level	Item Type	Correct Answer
1	(BIO.1E.2) Identify and describe the changes that occur in a cell during replication. Explore problems that might occur if the cell does not progress through the cycle correctly (cancer).	2	Multiple Choice	A
2	(BIO.1E.1) Construct models to explain how the processes of cell division and cell differentiation produce and maintain complex multicellular organisms.	2	Multiple Choice	C
3	(BIO.3B.2) Illustrate Mendel's law of independent assortment using Punnett squares and/or the product rule of probability to analyze monohybrid crosses.	2	Technology Enhanced	See Answer Key
4	(BIO.5.2) Analyze models of the cycling of matter (e.g., carbon, nitrogen, phosphorus, and water) between abiotic and biotic factors in an ecosystem and evaluate the ability of these cycles to maintain the health and sustainability of the ecosystem.	3	Multiple Choice	A
5	(BIO.3C.3) Use models to predict how various changes in the nucleotide sequence (e.g., point mutations, deletions, and additions) will affect the resulting protein product and the subsequent inherited trait.	3	Multiple Choice	A
6	(BIO.5.5) Evaluate symbiotic relationships (e.g., mutualism, parasitism, and commensalism) and other co-evolutionary (e.g., predator-prey, cooperation, competition, and mimicry) relationships within specific environments.	2	Technology Enhanced	See Answer Key
7	(BIO.2.2) Develop models of the major reactants and products of photosynthesis to demonstrate the transformation of light energy into stored chemical energy in cells. Emphasize the chemical processes in which bonds are broken and energy is released, and new bonds are formed and energy is stored.	2	Technology Enhanced	See Answer Key
8	(BIO.4.5) Use Darwin's Theory to explain how genetic variation, competition, overproduction, and unequal reproductive success acts as driving forces of natural selection and evolution.	2	Multiple Choice	C
9	(BIO.4.1) Use models to differentiate between organic and chemical evolution, illustrating the steps leading to aerobic heterotrophs and photosynthetic autotrophs.	2	Technology Enhanced	See Answer Key
10	(BIO.3B.3) Investigate traits that follow non-Mendelian inheritance patterns (e.g., incomplete dominance, codominance, multiple alleles in human blood types, and sex-linkage).	2	Multiple Choice	D

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11	(BIO.3C.1) Develop and use models to explain the relationship between DNA, genes, and chromosomes in coding the instructions for the traits transferred from parent to offspring.	2	Multi-Select	D, F
12	(BIO.1A.3) Using specific examples, explain how cells can be organized into complex tissues, organs, and organ systems in multicellular organisms.	2	Technology Enhanced	See Answer Key
13	(BIO.1E.3) Relate the processes of cellular reproduction to asexual reproduction in simple organisms (i.e., budding, vegetative propagation, regeneration, binary fission). Explain why the DNA of the daughter cells is the same as the parent cell.	2	Technology Enhanced	See Answer Key
14	(BIO.4.2) Evaluate empirical evidence of common ancestry and biological evolution, including comparative anatomy (e.g., homologous structures and embryological similarities), fossil record, molecular/biochemical similarities (e.g., gene and protein homology), and biogeographic distribution.	2	Technology Enhanced	See Answer Key
15	(BIO.4.4) Design models and use simulations to investigate the interaction between changing environments and genetic variation in natural selection leading to adaptations in populations and differential success of populations.	3	Multiple Choice	C
16	(BIO.2.4) Conduct scientific investigations or computer simulations to compare aerobic and anaerobic cellular respiration in plants and animals, using real world examples.	3	Multiple Choice	B
17	(BIO.3A.2) Compare and contrast mitosis and meiosis in terms of reproduction.	2	Technology Enhanced	See Answer Key
18	(BIO.1C.1) Develop and use models to explore how specialized structures within cells (e.g., nucleus, cytoskeleton, endoplasmic reticulum, ribosomes, Golgi apparatus, lysosomes, mitochondria, chloroplast, centrosomes, and vacuoles) interact to carry out the functions necessary for organism survival.	2	Technology Enhanced	See Answer Key
19	(BIO.5.3) Analyze and interpret quantitative data to construct an explanation for the effects of greenhouse gases on the carbon dioxide cycle and global climate.	3	Multiple Choice	A
20	(BIO.5.7) Investigate and evaluate factors involved in primary and secondary ecological succession using local, real world examples.	2	Technology Enhanced	See Answer Key

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Item Number	Objective	DOK Level	Item Type	Correct Answer
21	(BIO.2.1) Use models to demonstrate that ATP and ADP are cycled within a cell as a means to transfer energy.	2	Multiple Choice	B
22	(BIO.1C.2) Investigate to compare and contrast prokaryotic cells and eukaryotic cells, and plant, animal, and fungal cells.	2	Multiple Choice	C
23	(BIO.1C.3) Contrast the structure of viruses with that of cells, and explain why viruses must use living cells to reproduce.	2	Technology Enhanced	See Answer Key
24	(BIO.3A.1) Model sex cell formation (meiosis) and combination (fertilization) to demonstrate the maintenance of chromosome number through each generation in sexually reproducing populations. Explain why the DNA of the daughter cells is different from the DNA of the parent cell.	2	Multiple Choice	A
25	(BIO.1D.1) Plan and conduct investigations to prove that the cell membrane is a semi-permeable, allowing it to maintain homeostasis with its environment through active and passive transport processes.	2	Technology Enhanced	See Answer Key

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Technology Enhanced Items
Answer Key

Item #3
25%

Item #6

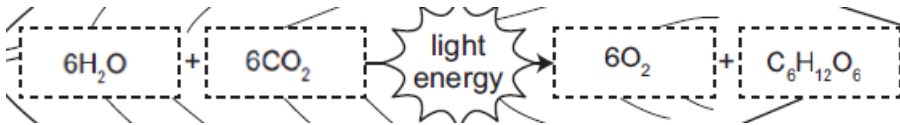
Description	Type of Relationship
A king snake stalks a small mouse before constricting it and eating it whole.	2
A tapeworm enters a host's digestive system and feeds on digested food.	4
An oxpecker bird lands on the back of a rhinoceros and feeds on parasites while being protected from predators.	3
Barnacles grow on the skin of a whale, leaving it unharmed, while filtering food as the whale swims.	1

Item #7

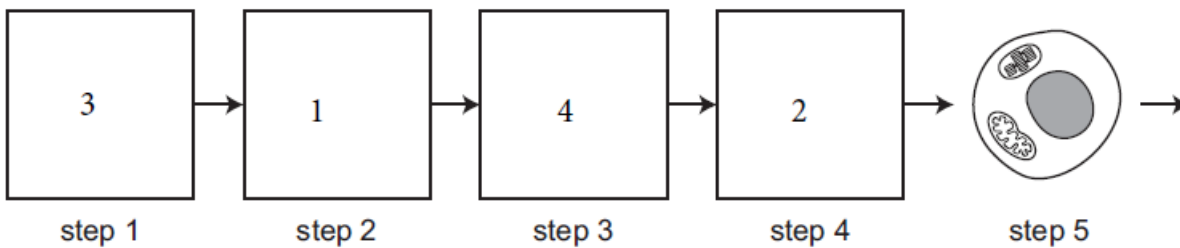
On each side of the arrow, the two *drag* entities can be reversed for full credit. Either response can be correct.



OR



Item #9



Item #12

- cell

tissue

organ

system

organism

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Technology Enhanced Items
Answer Key**

Item #13

Part A:

Regeneration is a form of (sexual / asexual) reproduction. Following regeneration, the DNA of the offspring is (identical to / different from) the DNA of the parent.

Part B: A

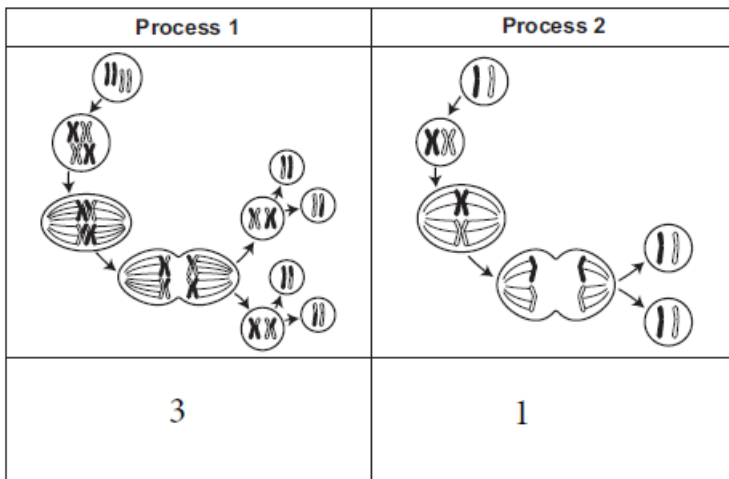
Item #14

Part A:

Compared to Hyracotherium, the height of modern horses has (decreased / increased / stayed the same) and the number of toes has (decreased / increased / stayed the same).

Part B: 3

Item #17



Item #18

Part A:

During protein synthesis, the (nucleus / lysosome / ribosome / mitochondrion / Golgi apparatus) stores the information for the protein, while the (nucleus / lysosome / ribosome / mitochondrion / Golgi apparatus) uses the information to build the protein.

Part B: B

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Technology Enhanced Items
Answer Key

Item #20

As the amount of available water (increased / decreased), the number of woody tree species (decreased / increased / stayed the same) and the number of plants growing in the water (decreased / increased / stayed the same).

Item #23

The virus (is / is not) considered to be alive. Like the virus, the bacterium has (a DNA-containing head / a tough external barrier / a fluid cytoplasm), but the bacterium is different because it has (DNA / tail fibers / ribosomes) that it uses to make proteins.

Item #25

