

Warm-Up: HSA Prep 2

Use the following information to answer questions #1 – #2.

A group of students conducted an experiment to study the growth of bean plants. They used two pots labeled “A” and “B.” Each pot contained 20 small bean plants of similar height. All the plants were treated alike except for the solution they received. Each day for five days, the plants in Pot A were given 40 milliliters of distilled water, while the plants in Pot B were given 40 milliliters of distilled water containing one gram of fertilizer. The table below shows the average height of the plants in each pot for each day of the experiment.

Plant Growth Experiment

Day	Average Height (centimeters)	
	Pot A: Water Only	Pot B: Water plus Fertilizer
1	2.0	2.0
2	2.2	2.3
3	2.3	2.8
4	2.5	3.2
5	2.6	3.8

- 1** Which of these questions were the students most likely trying to answer in this experiment?
- A. How does water affect the growth of bean plants?
 - B. How does fertilizer affect the growth of bean plants?
 - C. What is the maximum height of a bean plant?
 - D. How many days does it take a bean plant to grow?

- 2** Which of the following is the dependent variable in the students’ bean plant experiment?
- F. the day
 - G. the water
 - H. the fertilizer
 - J. the height of the bean plant

3 Which of the following is the primary function of carbohydrates?

- A. storage of energy
- B. transmission of genetic material
- C. acceleration of chemical reactions
- D. transport of molecules across membranes

4 The following statements all apply to one element. The element is...

- used by plants in photosynthesis
- found in carbohydrates, proteins, and lipids
- recycled by decay and burning
- found in all organic molecules

What is this element?

- F. carbon
- G. nitrogen
- H. phosphorus
- J. sulfur

5 A cell has a defect that results in the loss of its ability to regulate the passage of water, food, and wastes into and out of the cell. In which of the following cell structures is this defect most likely to be located?

- A. ribosomes
- B. chloroplasts
- C. cell membrane
- D. endoplasmic reticulum

6 Which of these statements best explains how genes and proteins are related?

- F. Genes are segments of DNA that code for proteins.
- G. Proteins are segments of DNA that code for genes.
- H. Genes are the building blocks of proteins.
- J. Proteins are the building blocks of genes.

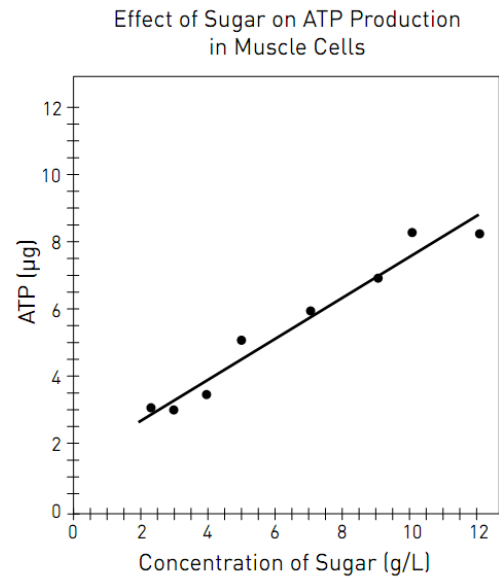
7 A mutation that prevents a maple tree from efficiently taking gases from the air would most directly affect which of the following processes?

- A. reproduction
- B. photosynthesis
- C. water uptake
- D. DNA replication

8 More than 1.5 million species of animals have been described, yet all of them have DNA that is made of the same building blocks. This is evidence that all animals...

- F. evolved from a common ancestor.
- G. produce identical fossils.
- H. have similar appearances.
- J. have the exactly the same DNA sequences.

9 The graph below represents data gathered during an experiment on cellular respiration.

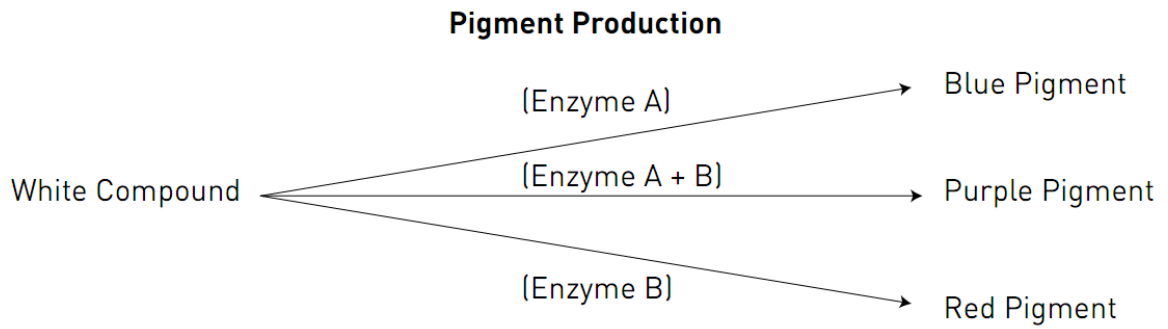


According to the data, as the concentration of sugar increases, the amount of ATP...

- A. increases.
- B. decreases.
- C. stays the same.
- D. decreases then increases.

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The diagram below shows a biochemical pathway.



In one species of plant, the flower petals are normally purple if both enzyme A and enzyme B are produced. If a mutation occurred that stopped production of enzyme A, but not enzyme B, what color flower petals would be produced?

- F. red
- G. blue
- H. white
- J. purple