

Biology Quiz

Category I

- 1 Cells typically respond to DNA damage in three ways: by ceasing to grow and divide until the damage is repaired, by permanently ceasing to grow and divide, or by dying. In 2010 a group of scientists reported that a certain kind of immune reaction can cause DNA damage that leads to a fourth response. DNA damage can turn off genes involved in cell-signaling pathways. Turning off these genes can cause less-mature cells to divide too rapidly, often leading to the development of —

- A tumors
- B allergies
- C hemophilia
- D cardiovascular disease

- 11 A student preparing for a hike wants to pack a snack that has biomolecules that provide quickly available energy but few excess calories. Which nutrition label lists the best combination of biomolecules that provide quickly available energy while providing the fewest calories from other types of biomolecules?

2

A

Nutrition Facts	
Serving Size: 1 Tbsp (6g)	
Amount Per Serving	
Calories: 20	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 60mg	2%
Potassium	
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 5g	

C

Nutrition Facts	
Serving Size: 1 cup (250g)	
Amount Per Serving	
Calories: 975	Calories from Fat 752
% Daily Value*	
Total Fat 83.5g	128%
Saturated Fat 12.25g	61%
Trans Fat	
Cholesterol 65mg	22%
Sodium 1775mg	74%
Potassium 22.5mg	1%
Total Carbohydrate 59.5g	20%
Dietary Fiber 0.25g	1%
Sugars 50.28g	
Protein 2.25g	

B

Nutrition Facts	
Serving Size: 1 package (50g)	
Amount Per Serving	
Calories: 180	Calories from Fat 75
% Daily Value*	
Total Fat 8g	13%
Saturated Fat 1g	5%
Cholesterol 0mg	0%
Sodium 55mg	2%
Total Carbohydrate 13g	5%
Fiber 1g	
Sugars 9g	
Protein 15g	

D

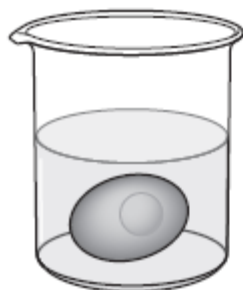
Nutrition Facts	
Serving Size: 1 bar	
Amount Per Serving	
Calories: 140	Calories from Fat 40
% Daily Value*	
Total Fat 4g	6%
Saturated Fat 1g	5%
Trans Fat 1g	0%
Cholesterol 0mg	0%
Sodium 90mg	4%
Total Carbohydrate 22g	7%
Dietary Fiber 2g	10%
Sugars 10g	
Protein 5g	8%

3 Cells can generate as many as 36 to 38 molecules of adenosine triphosphate (ATP) from the metabolism of one molecule of glucose. Which cellular process results in this amount of ATP production?

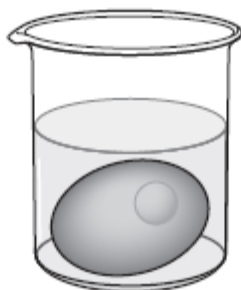
- A Anaerobic cellular respiration
- B Protein synthesis
- C Aerobic cellular respiration
- D Photosynthesis

4 Some students used vinegar to dissolve away the shells of three eggs and used these eggs as models of human red blood cells. The students observed the changes in the eggs when they were placed in different solutions.

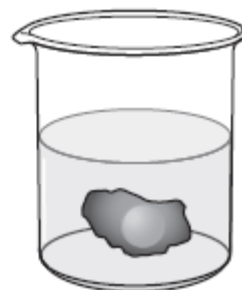
Red Blood Cell Model in Different Solutions



300 mL of
5% vinegar solution



300 mL of
pure water



300 mL of
corn syrup solution

Which statement best describes the role of the cell membrane in this model?

- A The cell membrane is an impermeable barrier that prevents water from entering the cell.
- B The cell membrane allows solutes to enter the cell, which causes the cell to shrink.
- C The cell membrane allows water to enter and leave the cell.
- D The cell membrane removes solutes from the environment.

5 Scientists can bioengineer skin in a laboratory to treat severe burns and other types of skin injuries. This bioengineered tissue is grown from living cells. The cellular process that enables the cells to grow and develop into tissue is —

- A conjugation
- B meiosis
- C budding
- D mitosis