Cell Survival Strategies

Compare cell structures to explain how cells meet life needs.

LS.2.c "similarities and differences between plant and animal cells determine how they support life processes;"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each structure shared by plant and animal cells, circle each structure found only in the plant cells, and write a 1 beside each sentence that connects a difference to a life process.

A Leaf Cell and a Muscle Cell

1. At noon, cells in a bean leaf and cells in a rabbit's muscles are both busy. Each cell has a membrane that controls what enters and leaves, cytoplasm where many reactions occur, mitochondria that release usable energy from food, and a nucleus with DNA instructions. These shared structures help both organisms obtain materials, make energy available, remove wastes, grow, and repair. Yet the two kinds of cells do not meet life's needs in exactly the same way.

2. Leaf cells also contain chloroplasts, which capture light energy to make glucose from carbon dioxide and water. This process, photosynthesis, supplies food molecules for the plant cell and can release oxygen. A large central vacuole stores water and dissolved substances. When it fills with water, it helps press outward on the cell wall. The rigid cell wall supports and protects the cell, helping a leafy plant stay firm enough to hold leaves toward light.

3. Rabbit muscle cells lack chloroplasts and cell walls, so they cannot make glucose from sunlight or gain support from a rigid outer layer. Instead, the rabbit gets food by eating, and its muscle cells use glucose and oxygen to release energy for contraction. Without a rigid cell wall and a large central vacuole, animal cells can change shape more easily. Their flexible membranes help them take in materials and release wastes while the whole animal moves, feeds, and responds to its surroundings.

2 ANSWER WITH EVIDENCE

Use the passage

1. Name two structures that leaf cells and rabbit muscle cells share. State one job that one of those structures does.

2. How do chloroplasts help a leaf cell obtain food in a way that a rabbit muscle cell cannot?

3. Explain how the large central vacuole and cell wall work together to support a leafy plant.

4. Compare how the bean leaf cells and rabbit muscle cells get glucose. Then explain how rabbit muscle cells use glucose.

3 YOUR TURN

Your own words

Draw a plant leaf cell in one panel and an animal muscle cell in the other, and label the membrane, nucleus, and mitochondria in both panels plus a chloroplast, cell wall, and large central vacuole only in the plant cell. In two sentences, explain how the extra plant structures support the plant and how the animal cell meets a different need.

ANSWER KEY

Cell Survival Strategies

GRADES 7-8 · LS.2.c

PART 1 · READ AND MARK

Underline each structure shared by plant and animal cells, circle each structure found only in the plant cells, and write a 1 beside each sentence that connects a difference to a life process. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Name two structures that leaf cells and rabbit muscle cells share. State one job that one of those structures does.	**Answers may name any two of these: membrane, cytoplasm, mitochondria, nucleus. The membrane controls what enters and leaves, mitochondria release usable energy from food, cytoplasm is where many reactions occur, and the nucleus contains DNA instructions.**
2	How do chloroplasts help a leaf cell obtain food in a way that a rabbit muscle cell cannot?	**Chloroplasts capture light energy to make glucose from carbon dioxide and water. Rabbit muscle cells lack chloroplasts, so they cannot make glucose from sunlight.**
3	Explain how the large central vacuole and cell wall work together to support a leafy plant.	**The vacuole stores water. When it fills, it presses outward on the rigid cell wall, and the wall supports and protects the cell so the plant can stay firm enough to hold leaves toward light.**
4	Compare how the bean leaf cells and rabbit muscle cells get glucose. Then explain how rabbit muscle cells use glucose.	**Leaf cells make glucose using light energy, carbon dioxide, and water. The rabbit gets glucose by eating food, and its muscle cells use glucose and oxygen to release energy for contraction.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The plant panel labels membrane, nucleus, mitochondria, chloroplast, cell wall, and large central vacuole, while the animal panel labels membrane, nucleus, and mitochondria. Chloroplasts make glucose using light, and the wall and vacuole support the plant cell, whereas the animal cell gets glucose from food and changes shape for movement because it lacks a wall and large central vacuole.

Accept equivalent descriptions of shared structures and their functions. For the drawing, check that plant-only structures appear only in the plant panel and that both written sentences connect structures to life processes.