

Cell Crew Casefile

Trace how cell structures keep plant and animal cells working.

8.13.A “identify the function of the cell membrane, cell wall, nucleus, ribosomes, cytoplasm, mitochondria, chloroplasts, and vacuoles in plant or animal cells;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each of the eight cell structure names in the passage. Next to each underlined name, write a one- to three-word note that states its job.

Pondweed and Fish Cells

- ① At a coastal science center, students compare cells from pondweed and a small fish. Each cell is crowded with parts that work together, not empty space. A cell membrane forms a flexible boundary around both kinds of cells. It controls which materials enter and leave. Inside, cytoplasm is a jellylike fluid where many cell activities occur. The nucleus stores DNA and directs cell activities. Ribosomes use genetic instructions to assemble proteins, molecules cells need for structure and many jobs.
- ② When a cell needs usable energy, mitochondria release energy from food molecules through cellular respiration. Plant and animal cells have mitochondria. Pondweed cells also have chloroplasts, which capture light energy to make sugars by photosynthesis. Animal cells do not have chloroplasts. Both types can contain vacuoles, storage spaces for water, nutrients, or wastes. Plant cells usually have one large central vacuole, while animal cells often have smaller vacuoles. The amount of stored water can affect a plant cell's firmness.
- ③ Pondweed cells have one more protective feature. Outside their cell membrane is a rigid cell wall made mainly of cellulose. The wall supports and protects the cell and helps it keep a regular shape. Fish cells lack cell walls, so their outer boundary is only the cell membrane. No one structure runs a cell alone. The membrane manages exchange, cytoplasm provides an internal setting, and organelles carry out specialized jobs. Together, these structures help cells stay alive in changing surroundings.

2 ANSWER WITH EVIDENCE Use the passage

1 How do the cell membrane and cell wall differ in function and in the kinds of cells that have them?

2 Explain how mitochondria and chloroplasts help cells obtain usable energy. Include which cells have each structure.

3 Which structure stores DNA and directs cell activities? Which structure assembles proteins?

4 What does cytoplasm do, and what can vacuoles store? How are plant and animal vacuoles commonly different?

3 YOUR TURN Your own words

Use the two panels to sketch a pondweed cell and a fish cell. Label every structure present and add a short function note for each label, including the structures that make the two cells different.

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PART 1 • READ AND MARK

Underline each of the eight cell structure names in the passage. Next to each underlined name, write a one- to three-word note that states its job. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How do the cell membrane and cell wall differ in function and in the kinds of cells that have them?	The cell membrane controls what enters and leaves both plant and animal cells. The cell wall supports, protects, and helps keep shape, and it is found in plant cells, not animal cells.
2	Explain how mitochondria and chloroplasts help cells obtain usable energy. Include which cells have each structure.	Mitochondria release energy from food molecules through cellular respiration and occur in plant and animal cells. Chloroplasts capture light energy to make sugars by photosynthesis and occur in plant cells, not animal cells.
3	Which structure stores DNA and directs cell activities? Which structure assembles proteins?	The nucleus stores DNA and directs cell activities. Ribosomes assemble proteins using genetic instructions.
4	What does cytoplasm do, and what can vacuoles store? How are plant and animal vacuoles commonly different?	Cytoplasm is a jellylike fluid where many cell activities occur. Vacuoles can store water, nutrients, or wastes. Plant cells usually have one large central vacuole, while animal cells often have smaller vacuoles.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Pondweed cell panel: cell membrane, controls entry and exit; cell wall, supports and protects; nucleus, stores DNA and directs; ribosomes, assemble proteins; cytoplasm, setting for activities; mitochondria, release energy from food; chloroplasts, capture light to make sugars; large vacuole, stores water, nutrients, or wastes. Fish cell panel: cell membrane, controls entry and exit; nucleus, stores DNA and directs; ribosomes, assemble proteins; cytoplasm, setting for activities; mitochondria, release energy from food; small vacuoles, store water, nutrients, or wastes.

Accept equivalent accurate wording for each structure's function. In the sketches, accept different shapes and locations if the plant cell includes a cell wall and chloroplasts, while the fish cell does not.