Name _____ Date _____

Plant and Animal Cells: Comparing Cell Structures in a Table

Directions: Read the passage and study both tables. Then answer each question.

Three Samples Under the Microscope

All living things are made of cells. Plant cells and animal cells share many parts, but a few parts are found only in plant cells.

A class used a light microscope to compare three samples. The first was a thin, clear layer peeled from inside an onion bulb. The second was a leaf from Elodea, a small plant that grows underwater. The third was cells gently scraped from the inside of a cheek with a clean cotton swab. The class added a drop of stain to the onion and cheek samples. A stain colors some cell parts so they are easier to see.

The class looked at every sample at the same magnification: 400 times. They recorded which structures they could see. A light microscope shows only the larger cell structures. Smaller organelles, such as mitochondria, are too small to see clearly this way, so the class did not record them.

Structures in typical plant and animal cells

Structure	What it does	Plant cells	Animal cells
Cell membrane	Thin layer around the cell that controls what moves in and out	Yes	Yes
Nucleus	Holds DNA, the instructions that direct the cell's activities	Yes	Yes
Mitochondria	Release energy stored in food so the cell can use it	Yes	Yes
Cell wall	Stiff outer layer that holds the cell's shape and supports the plant	Yes	No
Chloroplasts	Capture light energy and use it to make sugar	Yes, in green parts such as leaves	No
Large central vacuole	Stores water and helps keep the cell firm	Yes, in most	No

What the class saw in each sample at 400 times magnification

Sample	Cell wall	Chloroplasts	Nucleus	Cell shape
Onion bulb layer	Seen	Not seen	Seen	Long boxes packed side by side
Elodea leaf	Seen	Seen (many small green ovals)	Hard to see	Boxes packed side by side
Cheek cells	Not seen	Not seen	Seen	Flat and rounded with uneven edges, often apart

1. According to the table of cell structures, which three structures are found in plant cells but not in animal cells?

☐ A. Chloroplasts ☐ B. Cell wall ☐ C. Nucleus
☐ D. Large central vacuole ☐ E. Mitochondria ☐ F. Cell membrane

2. The class did not record mitochondria. Using the passage and the table of cell structures, which statement about the three samples is correct?

A. Only the Elodea cells had mitochondria, because they were the only green cells.
B. Cells in all three samples had mitochondria, even though they were too small to see.
C. Only the cheek cells had mitochondria, because plant cells use chloroplasts instead.
D. None of the samples had mitochondria, because the class did not see any.

3. Using the passage and both tables, which claim is supported?

A. Cheek cells have a cell wall that is too thin to see.
B. Some plant cells have no chloroplasts.
C. Elodea leaf cells have no nucleus.
D. Every plant cell has chloroplasts.

4. Suppose the class had viewed the onion at 40 times magnification and the Elodea at 400 times. Why would that make the chloroplast comparison unfair?

A. It would not be unfair, because magnification only changes how bright a sample looks.
B. At 40 times, cells look bigger, so the chloroplasts would be easier to see.
C. Chloroplasts are small, so they might be missed at 40 times even if they were there.

5. Which observation in the class's table tells you that a sample is made of animal cells, not plant cells?

A. No chloroplasts were seen. B. No cell wall was seen.
C. A nucleus was seen. D. The cells were viewed at 400 times.

6. A plant goes a week without water, and its cells lose water from their large central vacuoles. Based on the table of cell structures, what most likely happens?

A. Their chloroplasts take over the job of storing water.
B. The cells become firmer, so the plant stands up straighter.
C. The cells lose their cell walls.
D. The cells become less firm, so the plant's leaves may droop.

7. Match each cell structure to the job it does.

Write the letter of the matching answer on each line.

1. _____ Cell membrane
2. _____ Cell wall
3. _____ Mitochondria
4. _____ Chloroplasts

A. Use the energy in light to make sugar
B. Forms a firm frame around a plant cell
C. Free the energy locked in food so the cell can use it
D. Lets some materials enter or leave the cell while blocking others
E. Store water to keep the cell firm
F. Holds DNA, the cell's instructions

8. A student views a new sample at 400 times. The cells have a cell wall and a nucleus but no chloroplasts. Which sample could these cells come from?

A. The Elodea cells in which the class saw small green ovals
B. A root from a bean plant
C. Skin from a frog
D. The inside of a person's cheek