

Plant Cell Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the primary function of the cell wall in plant cells?

undefined. To conduct photosynthesis

undefined. To store nutrients

undefined. To provide structure and support ✓

undefined. To transport proteins

The primary function of the cell wall is to provide structure and support to the plant cell.

Which of the following are components of a plant cell? (Select all that apply)

undefined. Nucleus ✓

undefined. Chloroplasts ✓

undefined. mitochondria

undefined. Lysosomes

Components of a plant cell include the nucleus and chloroplasts.

Describe the role of chloroplasts in plant cells.

Chloroplasts are responsible for conducting photosynthesis, converting light energy into chemical energy.

List two differences between plant and animal cells.

1. Difference 1

Plant cells have a cell wall.

2. Difference 2

Plant cells contain chloroplasts.

Plant cells have a cell wall and chloroplasts, while animal cells do not.

Part 2: Understanding and Interpretation

Which organelle is primarily responsible for protein synthesis in plant cells?

undefined. Golgi Apparatus

undefined. Ribosomes ✓

undefined. Vacuole

undefined. Smooth ER

Ribosomes are primarily responsible for protein synthesis in plant cells.

How do plant cells maintain their shape? (Select all that apply)

undefined. Cell Wall ✓

undefined. Central Vacuole ✓

undefined. Cytoplasm

undefined. Plasmodesmata

Plant cells maintain their shape through the cell wall and central vacuole.

Explain how the central vacuole contributes to the plant cell's function.

The central vacuole stores nutrients and waste products and helps maintain turgor pressure.

Part 3: Application and Analysis

If a plant cell is placed in a hypertonic solution, what is likely to happen to the central vacuole?

undefined. It will expand

undefined. It will shrink ✓

undefined. It will remain unchanged

undefined. It will burst

The central vacuole will shrink due to the loss of water.

In which scenarios would a plant cell's chloroplasts be most active? (Select all that apply)

undefined. During the night

undefined. In bright sunlight ✓

undefined. Under a green light ✓

undefined. In a dark room

Chloroplasts are most active in bright sunlight and under a green light.

Describe how a plant cell would respond to a decrease in water availability.

A plant cell would lose turgor pressure, leading to wilting and reduced function.

Which part of the plant cell is most directly involved in communication with adjacent cells?

undefined. Nucleus

undefined. Plasmodesmata ✓

undefined. Ribosomes

undefined. Golgi Apparatus

Plasmodesmata are the structures involved in communication between adjacent plant cells.

Analyze the relationship between the nucleus and the endoplasmic reticulum. Which statements are true? (Select all that apply)

undefined. The nucleus directs the ER to synthesize proteins ✓

undefined. The ER modifies genetic material from the nucleus

undefined. The nucleus is involved in lipid synthesis

undefined. The ER is connected to the nuclear envelope ✓

The nucleus directs the ER to synthesize proteins, and the ER is connected to the nuclear envelope.

Explain how the structure of the cell wall contributes to its function in plant cells.

The cell wall's rigid structure provides support and protection, allowing plants to maintain shape and resist external pressures.

Part 4: Evaluation and Creation

Which adaptation would most improve a plant cell's ability to survive in a desert environment?

undefined. Larger chloroplasts

undefined. Thicker cell wall

undefined. Larger central vacuole ✓

undefined. More mitochondria

A larger central vacuole would help a plant cell retain more water, improving its survival in a desert environment.

Evaluate the importance of the cell membrane in plant cells. Which statements are accurate? (Select all that apply)

undefined. It regulates the movement of substances in and out of the cell ✓

undefined. It provides structural support

undefined. It is involved in energy production

undefined. It helps maintain homeostasis ✓

The cell membrane regulates substance movement and helps maintain homeostasis.

Design an experiment to test the effect of light intensity on the rate of photosynthesis in plant cells. Include your hypothesis, method, and expected results.

The experiment should include a hypothesis about light intensity increasing photosynthesis, a method for measuring oxygen production, and expected results showing higher rates with increased light.