

Cell Organelle Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

Which organelle is known as the "powerhouse of the cell"?

Hint: Think about where energy is produced in the cell.

- A) Nucleus
- B) Mitochondria ✓
- C) Golgi Apparatus
- D) Ribosome

■ The mitochondria are known as the powerhouse of the cell because they produce ATP.

Which of the following are functions of the endoplasmic reticulum?

Hint: Consider the roles of the rough and smooth ER.

- A) Protein synthesis ✓
- B) Lipid synthesis ✓
- C) Photosynthesis
- D) Detoxification ✓

■ The endoplasmic reticulum is involved in protein synthesis, lipid synthesis, and detoxification.

Describe the role of the nucleus in a eukaryotic cell.

Hint: Think about the nucleus as the control center of the cell.

The nucleus houses the cell's genetic material and regulates gene expression.

List two differences between plant and animal cells.

Hint: Consider the structures that are unique to each type of cell.

1. Difference 1

Plant cells have a cell wall.

2. Difference 2

Animal cells have lysosomes.

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

What is the primary function of ribosomes?

Hint: Think about what ribosomes are known for in the cell.

- A) Energy production
- B) Protein synthesis ✓**
- C) Lipid storage
- D) DNA replication

Ribosomes are primarily responsible for protein synthesis.

Part 2: Understanding and Application

Which organelle is directly involved in the modification and packaging of proteins?

Hint: Consider the organelle that is often referred to as the post office of the cell.

- A) Lysosome
- B) Golgi Apparatus ✓
- C) Chloroplast
- D) Smooth ER

■ The Golgi apparatus is responsible for modifying and packaging proteins.

Which of the following statements about chloroplasts are true?

Hint: Think about the functions and characteristics of chloroplasts.

- A) They are found in animal cells.
- B) They contain chlorophyll. ✓
- C) They are the site of photosynthesis. ✓
- D) They produce ATP through cellular respiration.

■ Chloroplasts contain chlorophyll and are the site of photosynthesis.

Explain how the cell membrane maintains homeostasis within the cell.

Hint: Consider the role of the cell membrane in regulating what enters and exits the cell.

■ The cell membrane maintains homeostasis by controlling the movement of substances in and out of the cell.

If a cell is unable to produce ATP, which organelle is most likely malfunctionING?

Hint: Think about the organelle responsible for energy production.

- A) Nucleus
- B) Mitochondria ✓
- C) Golgi Apparatus
- D) Ribosome

The mitochondria are responsible for ATP production, so if ATP production fails, mitochondria are likely malfunctionING.

A scientist discovers a new type of cell that contains a cell wall, chloroplasts, and a large central vacuole. Which of the following can be inferred about this cell?

Hint: Consider the characteristics of plant cells.

- A) It is a plant cell. ✓
- B) It is an animal cell.
- C) It performs photosynthesis. ✓
- D) It lacks a nucleus.

The presence of a cell wall, chloroplasts, and a large central vacuole suggests that this cell is a plant cell.

Describe how the structure of the cell membrane facilitates its function in selective permeability.

Hint: Think about the components of the cell membrane and their roles.

The cell membrane's phospholipid bilayer structure allows it to be selectively permeable, controlling what enters and exits the cell.

Part 3: Analysis, Evaluation, and Creation

Which organelle would be most affected if a cell is unable to detoxify harmful substances?

Hint: Consider the organelle involved in detoxification processes.

- A) Rough ER

- B) Smooth ER ✓
- C) Lysosome
- D) Peroxisome

■ The smooth endoplasmic reticulum (Smooth ER) is primarily involved in detoxification.

Analyze the relationship between the nucleus and ribosomes in protein synthesis. Which statements are correct?

Hint: Think about how genetic information is used in protein synthesis.

- A) The nucleus directs ribosome function. ✓
- B) Ribosomes are located inside the nucleus.
- C) Ribosomes translate genetic information from the nucleus. ✓
- D) The nucleus provides energy for ribosomes.

■ The nucleus directs ribosome function and provides the genetic information needed for protein synthesis.

Compare and contrast the roles of lysosomes and peroxisomes in cellular metabolism.

Hint: Consider the functions of each organelle in breaking down substances.

■ Lysosomes are involved in breaking down waste and cellular debris, while peroxisomes are involved in lipid metabolism and detoxification.

Which of the following scenarios would most likely result in a cell bursting?

Hint: Think about the effects of osmosis on cells.

- A) Excess water intake by osmosis ✓
- B) Loss of mitochondria
- C) Increased protein synthesis
- D) Decreased lipid production

Excess water intake by osmosis can lead to cell bursting due to increased internal pressure.

Evaluate the impact of a non-functional Golgi apparatus on a cell. Which outcomes are likely?

Hint: Consider the role of the Golgi apparatus in processing proteins.

- A) Accumulation of proteins in the ER ✓**
- B) Increased energy production
- C) Disruption in protein sorting ✓**
- D) Enhanced lipid synthesis

A non-functional Golgi apparatus would likely lead to accumulation of proteins in the ER and disruption in protein sorting.

Design an experiment to test the effect of temperature on the rate of photosynthesis in chloroplasts. Include your hypothesis, variables, and a brief description of the method.

Hint: Think about how you would set up an experiment to measure photosynthesis.

The experiment should include a hypothesis about temperature's effect on photosynthesis, independent and dependent variables, and a clear method for measuring the rate of photosynthesis.