

Prokaryotic And Eukaryotic Cells Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

Which of the following structures is present in both prokaryotic and eukaryotic cells?

Hint: Think about the basic components that all cells share.

- A) Nucleus
- C) Ribosomes ✓
- D) Golgi apparatus
- C) Mitochondria

▮ Ribosomes are present in both prokaryotic and eukaryotic cells.

Which of the following are characteristics of prokaryotic cells? (Select all that apply)

Hint: Consider the defining features of prokaryotic cells.

- A) Lack of nucleus ✓
- C) Circular DNA ✓
- D) Larger size compared to eukaryotic cells
- C) Presence of membrane-bound organelles

▮ Prokaryotic cells lack a nucleus and have circular DNA.

Describe the main function of the plasma membrane in cells.

Hint: Think about the role of the plasma membrane in maintaining homeostasis.

The plasma membrane regulates the movement of substances in and out of the cell.

List two examples of organisms that have eukaryotic cells.

Hint: Consider both unicellular and multicellular organisms.

1. Example 1

Humans

2. Example 2

Yeasts

Examples include plants, animals, fungi, and protists.

What is the primary function of mitochondria in eukaryotic cells?

Hint: Consider the role of mitochondria in energy metabolism.

- A) Protein synthesis
- C) Genetic material storage
- D) Photosynthesis
- A) Energy production ✓**

The primary function of mitochondria is energy production.

Part 2: Application and Analysis

A scientist discovers a new single-celled organism. It has a nucleus and several membrane-bound organelles. To which category does this organism most likely belong?

Hint: Think about the defining features of cell types.

- A) Prokaryotic
- C) Archaea
- D) Bacteria
- A) Eukaryotic ✓**

■ This organism most likely belongs to the eukaryotic category.

In which scenarios would you expect to find cells undergoing binary fission? (Select all that apply)

Hint: Consider the types of organisms that reproduce this way.

- A) Bacterial reproduction ✓**
- C) Yeasts reproduction ✓**
- D) Amoeba reproduction ✓**
- A) Human skin cell division

■ Binary fission is common in bacterial reproduction and some unicellular eukaryotes.

Describe how the presence of a cell wall in prokaryotic cells contributes to their survival in harsh environments.

Hint: Think about the protective functions of the cell wall.

■ **The cell wall provides structural support and protection against environmental stress.**

Which structural component is crucial for the movement of substances in and out of the cell?

Hint: Consider the role of membranes in cellular transport.

- A) Nucleus
- C) Plasma membrane ✓
- D) Ribosomes
- A) Cell wall

■ The plasma membrane is crucial for the movement of substances in and out of the cell.

Analyze the following statements and identify which are true for both prokaryotic and eukaryotic cells. (Select all that apply)

Hint: Consider the common features shared by both cell types.

- A) Both have ribosomes for protein synthesis. ✓
- C) Both have a plasma membrane. ✓
- D) Both have mitochondria for energy production.
- A) Both contain a defined nucleus.

■ Both cell types have ribosomes and a plasma membrane.

Part 3: Evaluation and Creation

If a eukaryotic cell loses its Golgi apparatus, which cellular process would be directly affected?

Hint: Think about the role of the Golgi apparatus in the cell.

- A) Energy production
- C) DNA replication
- D) Lipid synthesis
- A) Protein modification and sorting ✓

■ The process of protein modification and sorting would be directly affected.

Evaluate the following scenarios and identify which would likely lead to the evolution of a prokaryotic cell into a more complex form. (Select all that apply)

Hint: Consider factors that drive evolutionary changes in cells.

- A) Increase in environmental complexity ✓
- C) Decrease in available nutrients
- D) Isolation in a stable environment

A) Symbiotic relationships with other cells ✓

Increased environmental complexity and symbiotic relationships could lead to evolution.

Propose a hypothesis on how eukaryotic cells might have evolved from prokaryotic cells, considering the endosymbiotic theory.

Hint: Think about the relationships between different cell types.

The endosymbiotic theory suggests that eukaryotic cells evolved from prokaryotic cells through symbiotic relationships.

Reflect on the role of organelles in eukaryotic cells and suggest two ways in which they contribute to cellular efficiency and specialization.

Hint: Consider how organelles work together to perform specific functions.

1. Way 1

Compartmentalization of metabolic processes.

2. Way 2

Specialization of organelles for specific functions.

Organelles contribute to efficiency by compartmentalizing functions and allowing specialization of tasks.