Cell Structure And Function Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

Which of the following is NOT a part of the cell theory?

Hint: Think about the fundamental principles of cell theory.

- ◯ a) All living organisms are composed of one or more cells.
- ◯ **b) Cells can spontaneously generate from non-living matter. ✓**
- ◯ c) The cell is the basic unit of life.
- ◯ d) All cells arise from pre-existing cells.

> The correct answer is b) Cells can spontaneously generate from non-living matter, as this is not part of the cell theory.

Which of the following are characteristics of prokaryotic cells?

Hint: Consider the structural features that define prokaryotic cells.

- ☐ **a) Lack of nucleus ✓**
- ☐ b) Presence of membrane-bound organelles
- ☐ **c) Simpler structure ✓**
- ☐ **d) Found in bacteria and archaea ✓**

> The correct answers are a) Lack of nucleus, c) Simpler structure, and d) Found in bacteria and archaea.

Describe the primary function of the nucleus in a eukaryotic cell.

Hint: Think about the role of the nucleus in genetic material management.

The nucleus primarily functions to store and protect the cell's genetic material (DNA) and coordinate activities such as growth, metabolism, and reproduction.

List two differences between plant and animal cells.

Hint: Consider the unique structures found in each cell type.

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: Comprehension and Application

What is the primary role of ribosomes in the cell?

Hint: Think about the process of protein synthesis.

- ○ a) Energy production
- ○ **b) Protein synthesis ✓**
- ○ c) Lipid synthesis
- ○ d) DNA replication

The primary role of ribosomes is b) Protein synthesis.

Which of the following organelles are involved in the process of protein modification and packaging?

Hint: Consider the organelles that play a role in processing proteins.

- [x] **a) Golgi apparatus ✓**
- [x] **b) Rough endoplasmic reticulum ✓**
- [ ] c) Lysosomes
- [ ] d) Mitochondria

The correct answers are a) Golgi apparatus and b) Rough endoplasmic reticulum.

Explain how the structure of the phospholipid bilayer contributes to its function as a cell membrane.

Hint: Think about the properties of phospholipids and their arrangement.

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

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

Hint: Consider the effects of solute concentration on cell volume.

- ○ a) It will swell and burst.
- ○ b) It will remain unchanged.
- ○ **c) It will shrink. ✓**
- ○ d) It will divide.

The correct answer is c) It will shrink.

In which scenarios would active transport be necessary for a cell?

Hint: Think about the movement of substances across the cell membrane.

- [x] **a) Moving substances against their concentration gradient ✓**
- [ ] b) Facilitating osmosis
- [ ] c) Transportating large molecules
- [x] **d) Maintaining ion balance ✓**

> Active transport is necessary for a) Moving substances against their concentration gradient and d) Maintaining ion balance.

Describe a real-world example where understanding cell membrane transport is crucial, such as in medical treatments or biotechnology.

Hint: Consider how cell transport mechanisms are applied in various fields.

> **Understanding cell membrane transport is crucial in drug delivery systems, where the effectiveness of medications depends on their ability to cross cell membranes.**

Part 3: Analysis, Evaluation, and Creation

Which organelle would be most affected if a cell could no longer synthesize lipids?

Hint: Think about the organelles involved in lipid production.

- ○ a) Nucleus
- ○ **b) Smooth endoplasmic reticulum ✓**
- ○ c) Ribosomes
- ○ d) Golgi apparatus

> The correct answer is b) Smooth endoplasmic reticulum.

Analyze the relationship between the cytoskeleton and cell movement. Which components are involved?

Hint: Consider the structures that provide support and enable movement.

- [ ] **a) Microtuules ✓**
- [ ] **b) Actin filaments ✓**
- [ ] **c) Intermediate filaments ✓**
- [ ] d) Lysosomes

> The components involved are a) Microtuules, b) Actin filaments, and c) Intermediate filaments.

Compare and contrast the processes of photosynthesis and cellular respiration in terms of energy conversion and organelles involved.

Hint: Think about the inputs and outputs of each process.

> **Photosynthesis converts light energy into chemical energy in chloroplasts, while cellular respiration converts chemical energy into usable energy in mitochondria.**

Which of the following best evaluates the importance of lysosomes in maintaining cellular health?

Hint: Consider the functions of lysosomes in the cell.

- ○ a) They provide structural support.
- ○ **b) They digest and recycle cellular waste. ✓**
- ○ c) They synthesize proteins.
- ○ d) They transport substances across the cell membrane.

> The correct answer is b) They digest and recycle cellular waste.

Evaluate the impact of a malfunction ing Golgi apparatus on cellular function. Which processes would be affected?

Hint: Think about the role of the Golgi apparatus in processing and shipping proteins.

- [ ] **a) Protein modification ✓**
- [ ] b) Lipid synthesis
- [ ] c) Waste digestion

- [x] **d) Secretion of cellular products ✓**

> The processes affected would be a) Protein modification and d) Secretion of cellular products.

Design an experiment to test the effects of a new drug on the permeability of the cell membrane. Include your hypothesis, method, and expected results.

Hint: Consider how you would structure a scientific experiment.

> **The experiment could involve treating cells with the drug and measuring changes in permeability using a dye exclusion test.**