Worksheet Mitosis Answer Key PDF

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Part 1: Foundational Knowledge

Which phase of mitosis involves the alignment of chromosomes at the cell's equatorial plate?

undefined. A) Prophase
undefined. B) Metaphase ✓
undefined. C) Anaphase
undefined. D) Telophase

The correct answer is Metaphase, where chromosomes align at the equatorial plate.

Which of the following structures are involved in mitosis? (Select all that apply)

undefined. A) Spindle fibers ✓
undefined. B) Ribosomes
undefined. C) Centrioles ✓
undefined. D) Mitochondria

Spindle fibers and centrioles are involved in mitosis.

Describe the main purpose of mitosis in multicellular organisms.

The main purpose of mitosis is to enable growth and repair by producing identical daughter cells.

List the four main phases of mitosis in order.

1. Phase 1
Prophase

2. Phase 2
Metaphase

3. Phase 3

Anaphase

4. Phase 4

Telophase

The four main phases of mitosis are Prophase, Metaphase, Anaphase, and Telophase.

During which phase does the nuclear envelope begin to reform around the separated chromatids?

undefined. A) Prophase
undefined. B) Metaphase
undefined. C) Anaphase
undefined. D) Telophase ✓

The correct answer is Telophase, where the nuclear envelope reforms.

Part 2: Application and Analysis

If a cell has 8 chromosomes at the start of mitosis, how many chromosomes will each daughter cell have at the end?

undefined. A) 4
undefined. B) 8 ✓
undefined. C) 16
undefined. D) 32

Each daughter cell will have 8 chromosomes, as mitosis results in identical daughter cells.

In a laboratory setting, a scientist observes a cell with visible spindle fibers and chromosomes aligned at the center. Which of the following phases could the cell be in? (Select all that apply)

undefined. A) Prophase ✓
undefined. B) Metaphase ✓
undefined. C) Anaphase
undefined. D) Telophase

The cell could be in either Prophase or Metaphase, where spindle fibers are present.

Consider a scenario where a cell fails to undergo cytokinesis after mitosis. Predict the possible outcome for the cell.

The cell may end up with multiple nuclei, leading to potential dysfunction.

Which of the following best describes the relationship between the cell cycle checkpoints and mitosis?

undefined. A) Checkpoints are irrelevant to mitosis.

undefined. B) Checkpoints ensure that mitosis proceeds without errors. ✓

undefined. C) Checkpoints only function during interphase.

undefined. D) Checkpoints speed up the process of mitosis.

Checkpoints ensure that mitosis proceeds without errors, maintaining genomic integrity.

Analyze the effects of a malfunction in spindle fiber formation during mitosis. Which of the following outcomes are likely? (Select all that apply)

undefined. A) Chromosomes may not align properly. ✓

undefined. B) Sister chromatids may not separate. ✓

undefined. C) The nuclear envelope may not dissolve.

undefined. D) Cytokinesis may occur prematurely.

Malfunctions in spindle fiber formation can lead to improper chromosome alignment and separation.

Part 3: Evaluation and Creation

Which of the following scenarios would most likely result in a successful mitotic division?

undefined. A) A cell with damaged DNA proceeding through mitosis.

undefined. B) A cell with properly functioning checkpoints and spindle fibers. ✓

undefined. C) A cell skipping the metaphase stage.

undefined. D) A cell undergoing mitosis without cytokinesis.

A cell with properly functioning checkpoints and spindle fibers is most likely to divide successfully.

Evaluate the following statements about mitosis. Which are true? (Select all that apply)

undefined. A) Mitosis results in genetic variation.

undefined. B) Mitosis is crucial for tissue repair. ✓

undefined. C) Mitosis is involved in sexual reproduction.

undefined. D) Mitosis maintains chromosome number across generations. ✓

True statements include that mitosis is crucial for tissue repair and maintains chromosome number.

Design an experiment to investigate the effects of a chemical inhibitor on spindle fiber formation during mitosis. Outline the steps and predict the potential outcomes.

The experiment should outline the method of applying the inhibitor and observing the effects on spindle fiber formation.