

SCIENCE 9
UNIT 4:REPRODUCTION
WORKSHEET CELL CYCLE



Cell Cycle refers to the three stages of the life of a cell, which include interphase, mitosis, and cytokinesis.

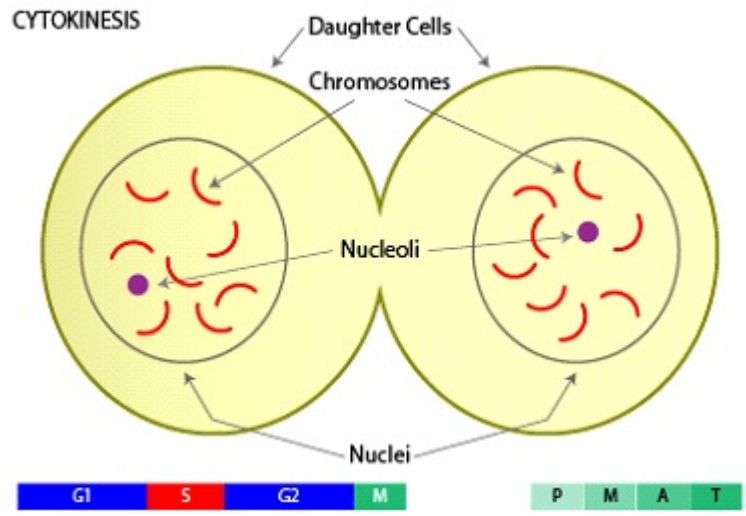
Interphase refers to the first and longest stage of the cell cycle, in which cells carry out life functions and cells that divide and prepare for cell division. There are three stages:

G1	S	G2
<p>Growth and Preparation: Cell increases in size and makes proteins and molecules necessary for cell to function</p>	<p>Replication: DNA copies or makes a replica of itself. To replicate itself the DNA molecule unwinds and the steps of the ladder break apart.</p>	<p>Growth and Preparation: Cell continues to grow and prepare for mitosis. DNA is in a loosely coiled form Organelles such as mitochondria and chloroplasts will be duplicated</p>

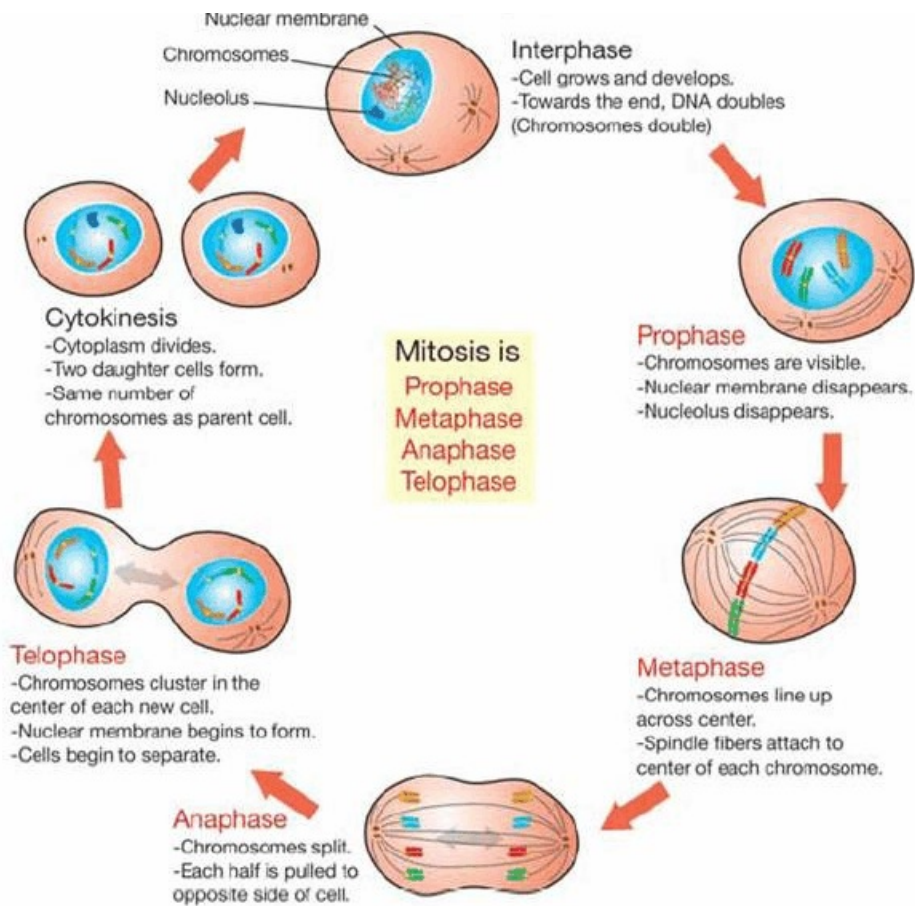
Mitosis the second and shortest, stage of the cell cycle; the process in which the duplicated genetic material from the cell's nucleus is divided between two daughter cells. It consist of four stages (PMAT)

<p>PROPHASE</p>	<ul style="list-style-type: none"> Chromosomes pair up into X shaped structures. Protein fibers known as spindle fibers begin to form. Protein fibers complete forming Attach to the chromosomes at a point called the centromere Nuclear membrane breaks down
<p>METAPHASE</p>	<ul style="list-style-type: none"> Chromosomes are pulled to the middle (equator) of the cell
<p>ANAPHASE</p>	<ul style="list-style-type: none"> Protein fibers contract and pull the chromatids to opposite poles of the cell
<p>TELOPHASE</p>	<ul style="list-style-type: none"> One complete set of chromosomes is now at each pole of the cell Nuclear membrane forms around each set of chromosomes. Now there are two nuclei in one cell

Cytokinesis. The final stage of the cell cycle, which separates the two nuclei and the cell contents into two daughter cells. The cell membrane pinches together to divide the cell's cytoplasm and organelles.



Summary of the cell cycle is illustrated in the diagram below:



PART A: MULTIPLE CHOICE

1. Which of the following refers to the life of a cell?
 - (A) Cell Cycle
 - (B) Cytokinesis.
 - (C) Interphase
 - (D) Mitosis

2. How many stages are in the cell cycle?
 - (A) 1
 - (B) 3
 - (C) 7
 - (D) 10

3. Which of the following would be a stage in the cell cycle?

- (A) Interphase
- (B) Cytokinesis.
- (C) Mitosis
- (D) All of the above

4. What is the correct order of the cell cycle?

- (A) Interphase → Cytokinesis → Mitosis
- (B) Interphase → Mitosis → Cytokinesis
- (C) Cytokinesis → Mitosis → Interphase
- (D) Mitosis → Interphase → Cytokinesis

5. Which of the following is the longest stage in the cell cycle

- (A) Interphase
- (B) Cytokinesis.
- (C) Mitosis
- (D) All occur over the same amount of time

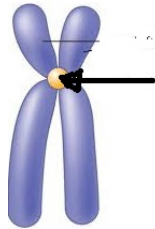
6. What is shown in the diagram to the right?

- (A) Cell
- (B) Chromosome
- (C) DNA
- (D) Gene



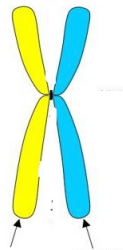
7. What is labelled in the diagram below?

- (A) Centromere
- (B) Centrioles
- (C) Chromatid
- (D) Spindle Fibres



8. What is labelled in the diagram below?

- (A) Centromere
- (B) Centrioles
- (C) Chromatid
- (D) Spindle Fibres



9. DNA replication occurs during

- (A) Mitosis
- (B) Cytokinesis
- (C) Interphase
- (D) Cell death

10. Which of the following is an acronym for the order of stages in mitosis?

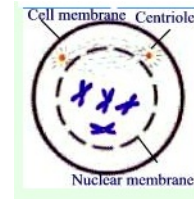
- (A) AMTP
- (B) MTPA
- (C) PMAT
- (D) TAPM

11. What is the process that divides the duplicated contents of a cell's nucleus into two equal parts?

- (A) Mitosis
- (B) Replication
- (C) Cytokinesis
- (D) Interphase

12. Which stage of mitosis is depicted in the diagram below?

- (A) Anaphase
- (B) Prophase
- (C) Telophase
- (D) Metaphase



13. During which stage of mitosis do chromatids separate to form two sets of daughter chromosomes?

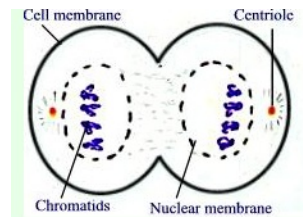
- (A) Metaphase
- (B) Anaphase
- (C) Telophase
- (D) Prophase

14. Which of the following is the longest stage of mitosis?

- (A) Metaphase
- (B) Prophase
- (C) Telophase
- (D) Anaphase

15. Which stage of mitosis is depicted in the diagram below?

- (A) Telophase
- (B) Anaphase
- (C) Prophase
- (D) Metaphase



16. During which phase of mitosis do the chromosomes line up along the middle of the dividing cell?

- (A) Prophase
- (B) Metaphase
- (C) Anaphase
- (D) Telophase

17. The first phase of mitosis is called

- (A) Prophase
- (B) Anaphase
- (C) Metaphase
- (D) Telophase

18. What is the correct order of the Mitosis?

- (A) Anaphase → Metaphase → Telophase → Prophase
- (B) Metaphase → Anaphase → Prophase → Telophase
- (C) Telophase → Anaphase → Metaphase → Prophase
- (D) Prophase → Metaphase → Anaphase → Telophase

19. What term is used to describe the final stage of the cell cycle, which separates the two nuclei and the cell contents into two daughter cells?

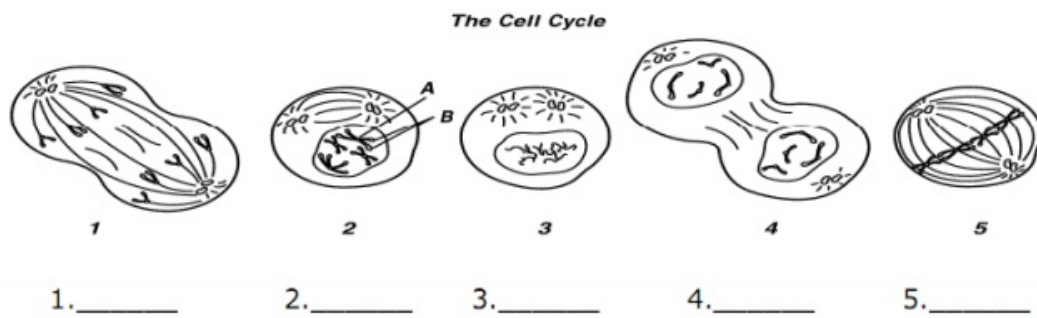
- (A) Mitosis
- (B) Replication
- (C) Cytokinesis
- (D) Interphase

PART B: FILL IN THE BLANKS

Part 1: Directions: Match the description with the part of the cell cycle:

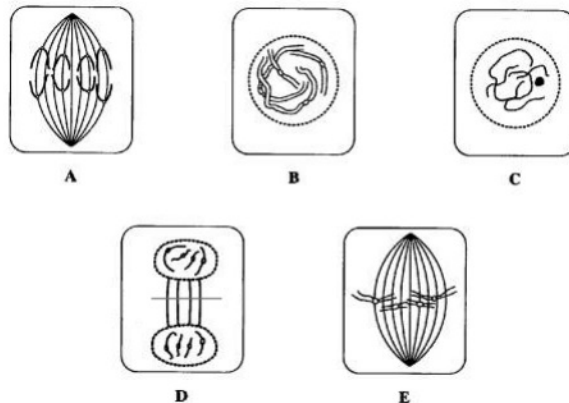
___ 1. The chromosomes line up across the middle of the cell.	A. Interphase
___ 2. The cell grows, matures, and eventually copies its DNA.	B. Prophase
___ 3. The chromatids are pulled apart, to opposite ends of the cell.	C. Metaphase
___ 4. The chromatin forms chromosomes, nuclear membrane gone.	D. Anaphase
___ 5. The cell membrane pinches in, dividing the cytoplasm into 2 cells.	E. Telophase
___ 6. A nuclear membrane forms around both sets of chromatids.	F. Cytokinesis

Part 2: Directions: Match the illustration with the part of the cell cycle: (use above letters from questions 1-6)



Part 3: Directions: Using the illustration from part 2, arrange the number of illustrations 1 – 5 in the correct order for the process of mitosis. Write the order below.

PART 4: The drawings A-E show stages of mitosis in an animal cell. (a) Which of the drawings A -E shows



- (i) interphase _____ (DNA is replicated)
- (ii) prophase _____ (chromosomes – 2 sister chromatids – shorten)
- (iii) metaphase _____ (sister chromatids line up)
- (iv) anaphase _____ (sister chromatids separate)
- (v) telophase _____ (new nucleus forms at each end)
- (vi) cytokinesis _____ (cell contents divided between 2 daughter cells)

PART C: OPTIONAL ACTIVITY

Label the stages of the cell cycle & mitosis. LABEL and COLOR the stages in the plant cell and animal cell. The stages should be colored as follows --- interphase-pink, prophase-light green, metaphase-red, anaphase-light blue, and telophase-yellow. Also label the CENTRIOLES, SPINDLE FIBERS, CENTROMERE, and CHROMOSOMES.

