

# MITOSIS WORKSHEET

Name: \_\_\_\_\_

**Matching:** Match the term to the description

I = interphase

P = prophase

M = metaphase

A = anaphase

T = telophase

- A 1. The sister chromatids are moving apart.      T 8. Animal cells begin to pinch in.
- P 2. The nuclear membrane fades from view.      P 9. The spindle is formed.
- T 3. A new nuclear membrane is forms.  
around the chromosomes      M 10. Chromatids line up along the equator.
- T 4. The cytoplasm of the cell is being divided.      I 11. Chromosomes are not visible.
- I 5. The chromatin is found in the nucleus.      T 12. Cytokinesis begins.
- M 6. The chromosomes are located at.  
the equator of the cell      T 13. The cell plate in plants **begins** to form.
- T 7. The spindles disappear.      T 14. The reverse of prophase.

**Fill in the blanks using the word bank below:**

Interphase

Prophase

Anaphase

Telophase

Metaphase

Cytokinesis (2x)

Sister Chromatid

Centromere

Cell Plate

- Telophase 18. In what phase does the cell begin to split the cytoplasm and daughter cells first become visible in mitosis?
- Anaphase 19. During what phase of mitosis do centromeres divide and the chromosomes move toward their respective poles?
- Prophase 20. What is the phase where chromatin condenses to form chromosomes?
- Centromere 21. What is the name of the structure that connects the two sister chromatids?
- Sister Chromatid 22. In a chromosome pair connected by a centromere, what is each individual chromosome half called?
- Cytokinesis 23. What is the step of cell division where 2 identical daughter cells are formed?
- Interphase 24. Which phase of the cell cycle occurs when the cell is preparing to divide so it grows in size making organelles and copying DNA?
- Cell plate 25. What forms across the center of a plant cell near the end of telophase?
- Cytokinesis 26. What is the division of the cytoplasm called?
- Metaphase 27. During this phase chromosomes line up in the middle.

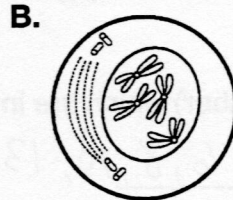
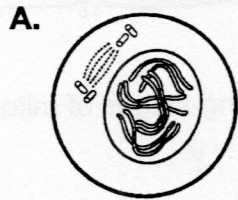
# The Sequence of Mitosis

**Making the Connection:** Through observing sequences, taking notes, and drawing conclusions, we are able to more accurately describe scientific processes.

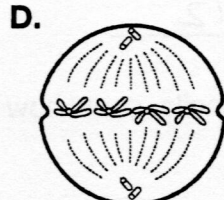
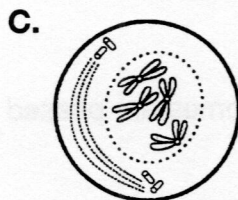
The sequence of pictures below depicts the changes an animal cell undergoes during mitosis. Each stage of the process is labeled, A through G. In the blank lines below the pictures, describe what you see occurring during each stage.

Next, write a few sentences that explain why mitosis happens in cells. What would happen if mitosis did not occur?

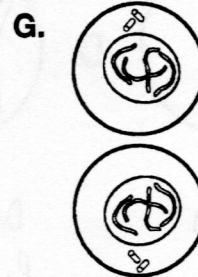
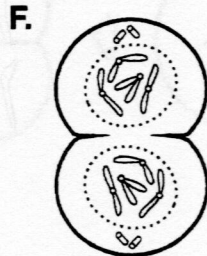
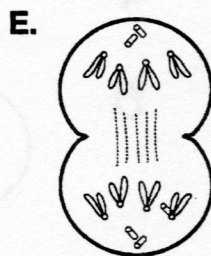
Mitosis occurs when an organism needs to repair itself or grow. Mitosis also occurs in single celled organisms to increase their population size



Early Prophase - middle prophase - Chrom condense and centrioles move and spindle fibers appear

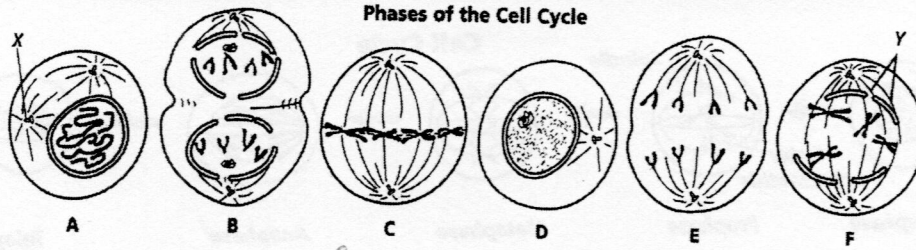


Late Prophase - Metaphase - Nuclear envelope breaks down and chromosomes align in the middle



Anaphase - Telophase - Cytokinesis - Chromosomes move apart, cell pinches in and cytoplasm divides.

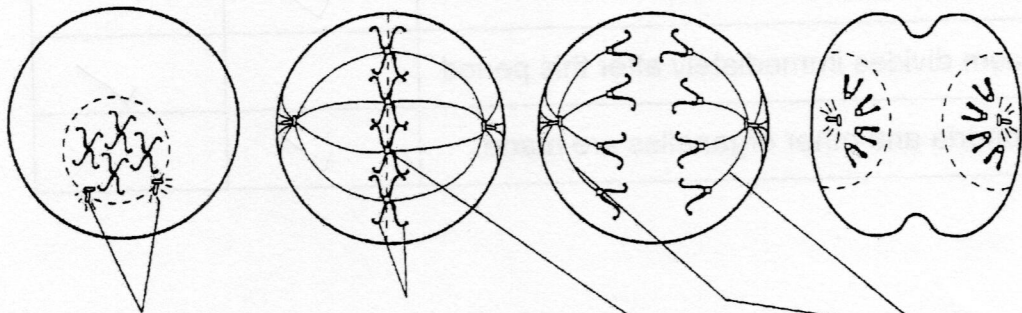
The following are not in the correct order. Please answer the questions below.



13. Which cell is in metaphase? C
14. Cells A and F show an early and late stage of the same phase of mitosis. What phase is it? prophase
15. In cell A, what is the structure labeled X? Centrioles
16. In cell F, what is the structure labeled Y? spindle fibers
17. Which cell is not in a phase of mitosis? D
18. What two main changes are taking place in cell B? cell pinch in / nucleus reforms
19. Sequence the six diagrams in order from first to last. D A F C E B
20. What is the end product of mitosis? 2 identical cells
21. What is the main difference between cytokinesis in plants and animals?  
plants - cell plate  
animals -

Identify the following phases of mitosis. Use these choices: telophase, metaphase, anaphase, prophase. Then label the diagrams. Use these choices: sister chromatids, centromere, spindle fibers, centrioles.

22. Prophase    23. Metaphase    24. Anaphase    25. Telophase



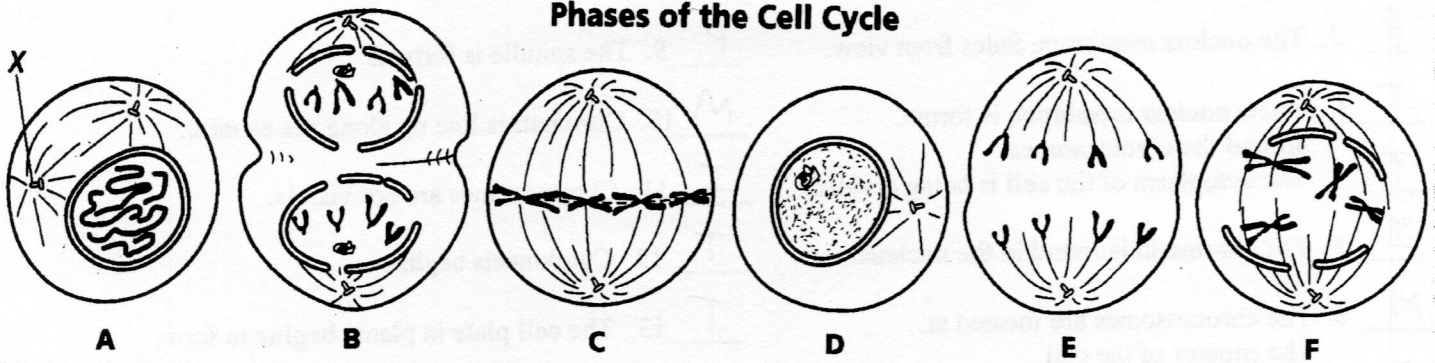
26. Centriole    27. Sister Chromatids    28. Centromere    29. Spindle fibers



# Mitosis Worksheet

The diagram below shows six cells in various phases of the cell cycle. Note the cells are not arranged in the order in which mitosis occurs and one of the phases of mitosis occurs twice. Use the diagram to answer questions 1-7.

Phases of the Cell Cycle



1) Cells A and F show an early and a late stage of the same phase of mitosis. What phase is it?

prophase

2) Which cell is in metaphase?

C

3) Which cell is in the first phase of mitosis? A (Early prophase)

4) In cell A, what structure is labeled X? Centriole

5) Place the diagrams in order from first to last.

D A F C E B

6) Are the cells depicted plant or animal cells? Explain your answer.

Animal → no cell wall / cell plate

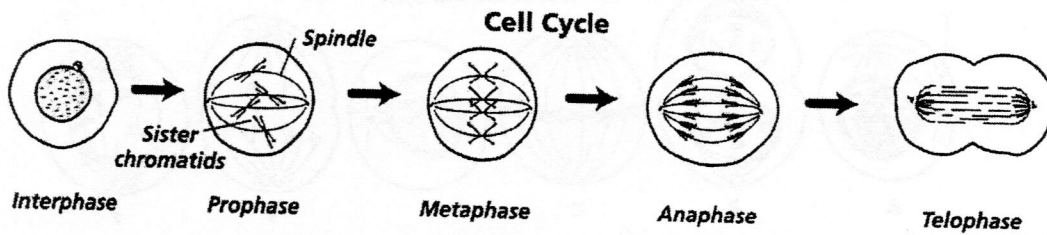
7) What is the longest phase of the entire cell cycle?

Interphase

8) Why is mitosis important?

Two new cells (growth / repair / replication)

**Mitosis Worksheet & Diagram Identification**

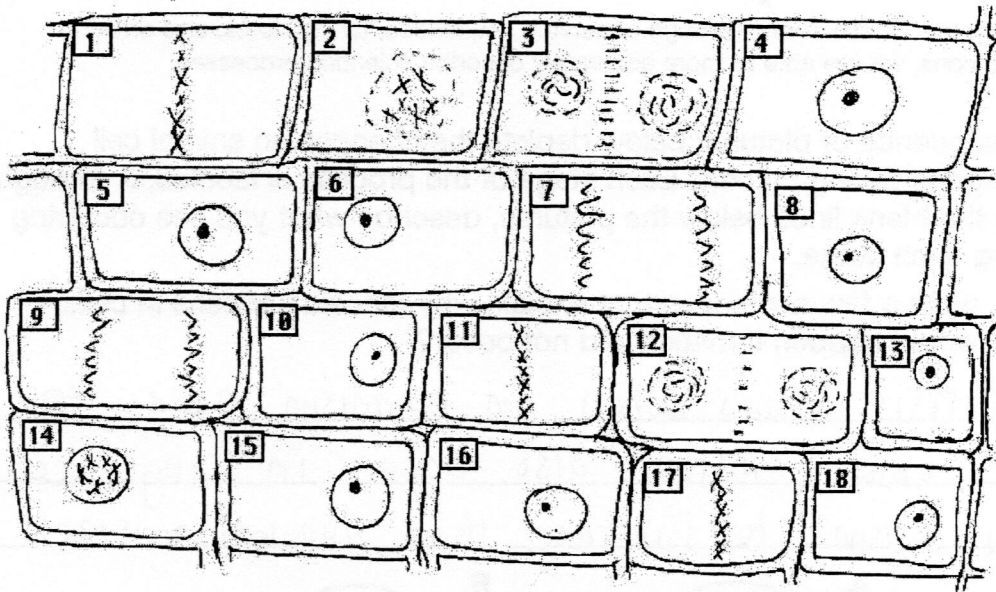


1. Chromosomes move to the middle of the spindle during what phase? Metaphase
2. What are sister chromatids? When do they separate? 2 copies of a chromosome - Anaphase
3. During which phase do chromosomes first become visible? prophase
4. ~~In multicellular organisms, the cell cycle produces groups of cells that perform the same function. What are these groups of cells called?~~

Complete the table by checking the correct column for each statement.

Statement	Interphase	Mitosis
5. Cell growth occurs	✓	
6. Nuclear division occurs		✓
7. Chromosomes are distributed equally to daughter cells.		✓
8. Protein production is high	✓	
9. Chromosomes are duplicated	✓	
10. DNA synthesis occurs	✓	
11. Cytoplasm divides immediately after this period		✓
12. Mitochondria and other organelles are made.	✓	

7. This drawings shows various stages of mitosis in a fast growing onion root tip.



Identify the cells (by number) which are in the following stages of mitosis:

- interphase 4, 5, 6, 8, 10, 13, 15, 16, 18
- prophase 2, 14
- metaphase 1, 11, 17
- anaphase 7, 9
- telophase 3, 12

8. Using colored pens or pencils, show how 2 chromosomes are passed from parent cell to two daughter cells.

