

# The Cell Cycle and Mitosis

Textbook pages 150–165

## Before You Read

How do cells replace themselves? Record your ideas on the lines below.

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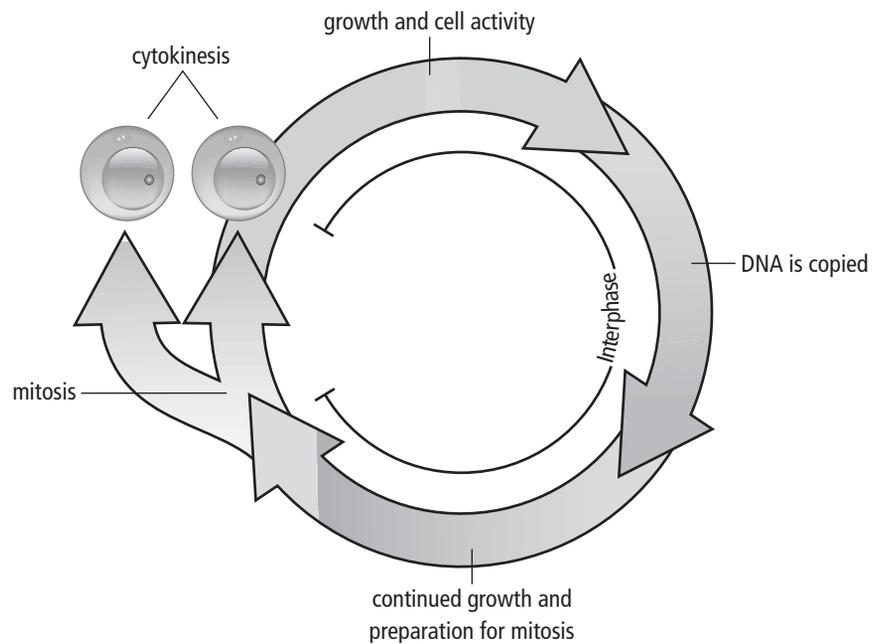


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### Mark the Text

#### Create a Chart

Highlight the text that describes the three stages of the cell cycle. In a different colour, highlight text that describes how cells divide. Use the highlighted text to create a chart about the life of a cell.



### What is the cell cycle?

The three stages of the life of a cell together are called the **cell cycle**. These three stages are:

- ◆ **interphase:** This stage makes up most of the life of the cell. During interphase, cells grow and carry out their life functions. In cells that will divide, the nucleus makes a copy of its DNA in a process called **replication**.
- ◆ **mitosis:** During this stage, the nucleus of the cell divides into two equal and identical parts. Each part has a copy of the DNA.
- ◆ **cytokinesis:** During this stage, the two equal, identical parts of the cell separate. The result of this stage is two identical cells, each with a nucleus and DNA. ✓

### ✓ Reading Check

1. What are the three stages in the life of a cell?

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## What are the phases of mitosis?

There are four phases of mitosis. These phases are prophase, metaphase, anaphase, and telophase.

Phases of mitosis	What happens
prophase 	<ul style="list-style-type: none"> <li>the duplicated chromosomes form into an X shape and the nucleolus disappears.</li> <li><b>spindle fibres</b>, which are tiny tube-like structures made of protein, begin to form in plant and animal cells</li> </ul>
metaphase 	<ul style="list-style-type: none"> <li>the duplicated chromosomes line up across the middle of the cell</li> </ul>
anaphase 	<ul style="list-style-type: none"> <li>the duplicated chromosomes move apart to opposite ends of the cell</li> </ul>
telophase 	<ul style="list-style-type: none"> <li>a nucleolus forms around the chromosomes at the opposite ends of the dividing cell</li> </ul>

## How can mutagens affect the cell cycle?

Mutagens can cause changes in the cell cycle so that cells keep dividing continuously. The cells pile up on top of one another, forming a lump called a tumour. The uncontrolled cell division sometimes results in diseases called **cancers**. Cancerous cells may grow in one place in the body, or they may spread to other parts of the body where they will continue to divide. ✓

### ✓ Reading Check

2. What is cancer the result of?

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Use with textbook pages 153–158.

## Getting to know the cell cycle

### Vocabulary

anaphase	mitosis
cell cycle	nucleolus
cytokinesis	nucleus
DNA	prophase
duplicated chromosomes	telophase
four	three
interphase	two
metaphase	

Use the terms in the vocabulary box to fill in the blanks. You can use each term more than once. You will not need to use every term.

- There are \_\_\_\_\_ stages in the life of a cell.
- The stage that makes up most of the cell's life is \_\_\_\_\_.  
During this stage, cells grow and carry out their life functions. In cells that will divide, the nucleus makes a copy of its \_\_\_\_\_.
- During \_\_\_\_\_, the nucleus of the cell divides into two equal and identical parts. Each part has a copy of the DNA.
- During \_\_\_\_\_, the two equal, identical parts of the cell separate. This stage forms \_\_\_\_\_ identical cells with a nucleus and DNA.
- There are \_\_\_\_\_ phases of mitosis.
- In \_\_\_\_\_, the duplicated chromosomes contract into an X shape and the \_\_\_\_\_ disappears.
- In \_\_\_\_\_, the \_\_\_\_\_ line up across the middle of the cell.
- In \_\_\_\_\_, the \_\_\_\_\_ move apart to opposite ends of the cell.
- In \_\_\_\_\_, a \_\_\_\_\_ forms around the chromosomes at the opposite ends of the dividing cell.

Name \_\_\_\_\_

Date \_\_\_\_\_

Use with textbook pages 150–165.

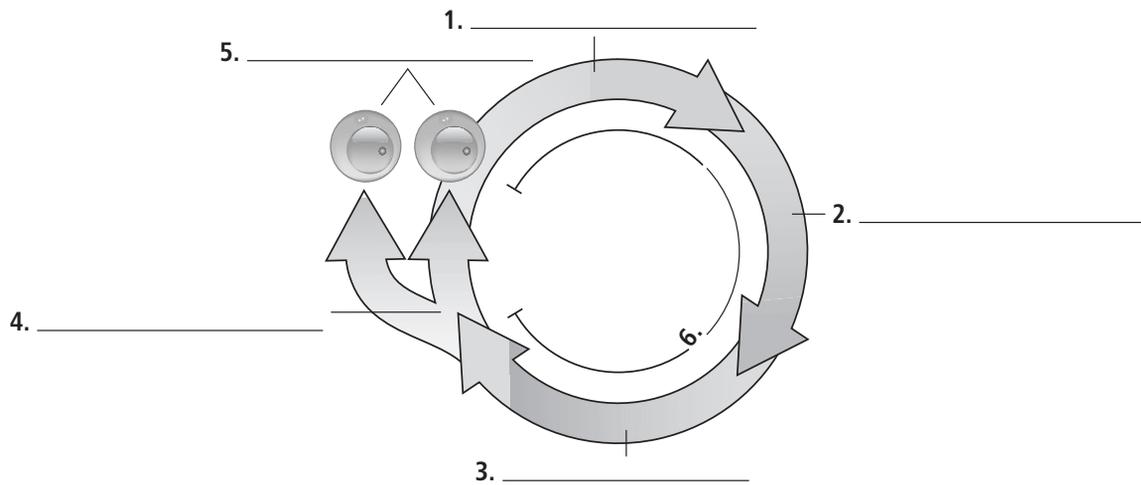
## Identifying stages of the cell cycle

### Vocabulary

continued growth and preparation  
cytokinesis  
replication

growth and preparation  
interphase  
mitosis

Use the vocabulary words in the box above to label the stages of the cell cycle in the following diagram.



Briefly describe what is occurring in each stage of the cell cycle.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_
5. \_\_\_\_\_  
\_\_\_\_\_
6. \_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Use with textbook pages 156–157.

## Mitosis

Summarize what is happening in the cell for each phase of mitosis. Then draw a labelled diagram of each phase.

Phase	What is happening in the cell?	Labelled diagram
prophase		
metaphase		
anaphase		
telophase		

Name \_\_\_\_\_

Date \_\_\_\_\_

Use with textbook pages 150–161.

## The cell cycle and mitosis

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. _____ cell cycle	<b>A.</b> first and longest stage of the cell cycle
2. _____ cytokinesis	<b>B.</b> process during which the cell copies DNA information in the nucleus
3. _____ interphase	<b>C.</b> result of uncontrolled cell division
4. _____ mitosis	<b>D.</b> process in which the duplicated contents of the cell's nucleus divide into two equal parts
5. _____ replication	<b>E.</b> three stages of the life of a cell
	<b>F.</b> final stage of the cell cycle, which separates the two nuclei and the cell contents into two identical cells

Circle the letter of the best answer.

- 6.** Tiny tube-like structures made of protein are called
- A.** spindle fibres
  - B.** chromosomes
  - C.** nucleolus
  - D.** DNA replication

- 7.** Which stage is the longest in the cell cycle?
- A.** interphase
  - B.** mitosis
  - C.** cytokinesis
  - D.** DNA replication
- 8.** The phase of mitosis where the chromosomes line up across the middle of the cell is
- A.** anaphase
  - B.** metaphase
  - C.** prophase
  - D.** telophase
- 9.** The phase of mitosis in which the duplicated chromosomes form into an X shape is
- A.** anaphase
  - B.** metaphase
  - C.** prophase
  - D.** telophase
- 10.** The phase of mitosis in which duplicated chromosomes move apart to opposite ends of the cell is
- A.** anaphase
  - B.** metaphase
  - C.** prophase
  - D.** telophase
- 11.** The phase of mitosis in which a nucleolus forms around the chromosomes is
- A.** anaphase
  - B.** metaphase
  - C.** prophase
  - D.** telophase