

Chapter 5: Cell Growth and Division

Why do cells divide?

1. _____ of organisms.
2. _____ (cuts, burns, etc.).
3. Cells have _____ limits.
 - a. If too small, they cannot contain necessary _____.
 - b. If too large they cannot take in enough materials (_____, _____) or get rid of waste adequately.
4. _____ increases faster than _____ so they must divide

Examples:

Cells Divide at different Rates:

- The _____ of cell division varies with the _____ for those _____ of cells.

Cell Size

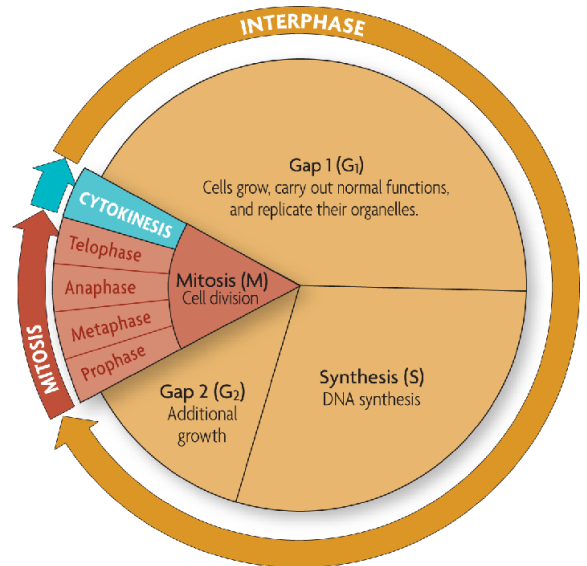
- Cell size is _____

The Cell Cycle

- Cell cycle: the sequence of _____, _____ replication, and _____ of a cell.
- The cell cycle is divided into two periods
 1. _____: the period of _____ (G₁, S, G₂ phases)
 2. _____: the period of _____ (_____ and cytokinesis).

Interphase

- The period of _____.
- _____ part of the cell cycle.
- Cell grows in _____ and carries on metabolism.
- Three stages:
 1. **Gap 1 (G₁ phase)** - cell grows in size and _____ are produced. More _____ are also produced.
 2. _____ (**S phase**) - chromosomes _____; this is the only time that _____ is produced. At the end of this stage, the cell _____ of _____.
 3. **Gap 2 (G₂ phase)** - short _____. Cell parts needed for cell _____ are _____.



M Phase: Cell Division

- Two processes are involved in the cell division phase
 - (1) _____ - division of the cell _____ and its contents.
 - (2) _____ - the process that divides the _____.

Section 5.2: Mitosis and Cytokinesis

Chromosomes

- Chromosome: one long continuous thread of _____ that consists of numerous _____.
- Humans have _____ chromosomes (_____ pairs)
- DNA condenses into _____ at the start of mitosis
- DNA _____ tightly around proteins called _____ causing it to _____.
- DNA plus proteins is called _____.
- One half of a duplicated chromosome is a _____.
- Sister chromatids are held together at the _____.
- _____ protect DNA and do not include _____.



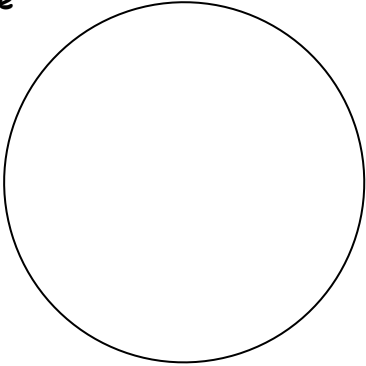
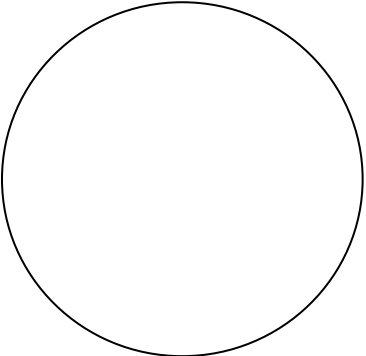
MITOSIS

- Mitosis = division of the cell _____ and its contents--produces two genetically _____ cells
- Mitosis produces all of the cells in your body with the exception of _____ (egg and sperm)
- Mitosis is divided into 4 phases:

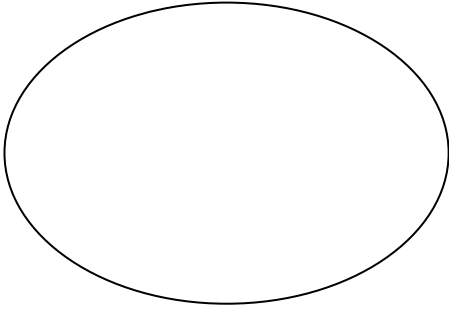
_____, _____, _____, _____

PHASE

EVENTS THAT OCCUR DURING IT

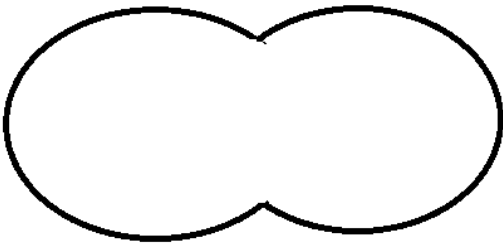
PHASE	EVENTS THAT OCCUR DURING IT
Prophase 	<ul style="list-style-type: none"> • 1st and longest phase • _____ coils into chromosomes • _____ breaks down. • _____ disappears • _____ begin to migrate to opposite sides (poles) of the cell. • _____ begin to form between the centrioles. • Spindle = football shaped structure that chromosomes attach to by their _____
Metaphase 	<ul style="list-style-type: none"> • 2nd phase of mitosis • Chromosomes become attached to the _____ by their _____ • The chromosomes line up in the _____ (equator) of the cell

Anaphase



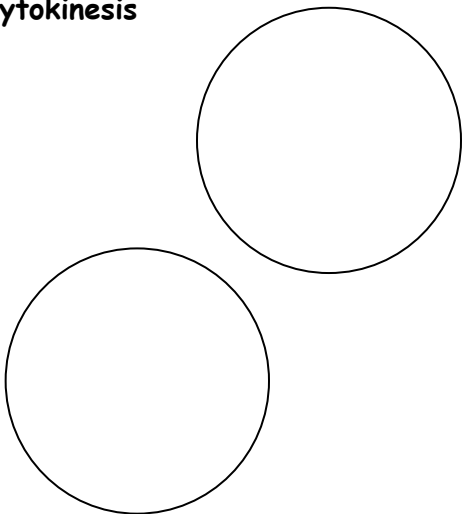
- 3rd phase of mitosis
- The _____ split apart, and the sister _____
- The _____ are pulled apart to opposite sides of the cell

Telophase



- 4th and final phase
- The _____ reach the opposite poles of the cell
- Chromosomes _____
- _____ breaks down
- _____ reappears
- Nuclear envelope forms around each new set of _____

Cytokinesis



- Cytokinesis divides the _____ into the two new cells.
- Different in animal and plant cells.
- Animal cells- the cell membrane pinches to form a _____
- Plant cells- _____ forms

- When a cell divides through mitosis, each _____ cell gets a copy of the _____.
- End product: _____

Section 5.3: Regulation of Cell Cycle

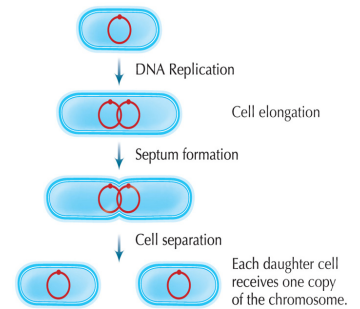
- The cell cycle is regulated by 2 groups of _____:
 1. _____: stimulate cell growth
 2. _____: help regulate cell growth

Cancer

- _____ are substances known to _____
 - Examples:
- _____ = _____ (mitosis gone crazy!)
- _____ = _____
 - _____ = harmful; spreads
 - _____ = not harmful; does not spread

Section 5.4: Asexual Reproduction

- It is asexual because _____
 1. _____ is the reproduction of single-celled organisms
 - It is like mitosis because the cell _____ and divides to make _____.
 - _____



Advantages of Reproducing Asexually:

- _____
- Don't have to find a _____
- Less likely to make _____ copying _____

Disadvantages of Reproducing Asexually

- _____
- _____
- Species cannot _____ to become _____

Some _____ can reproduce through mitosis:

2. _____: new organism is formed from a small _____ on the _____ of the parent (_____)
3. _____: the _____ of the parent into _____ that each grow into a new organism (_____)
4. _____: forms a new plant from the _____ or underground structure on the parent plant (_____)

Section 5.5: Multicellular Organization

Cells work together to carry out _____.

