

Topics	Notes, Diagrams, Drawings
The Cell Cycle	<ul style="list-style-type: none"> • Like changing seasons or the growth of trees, cells go through cycles • Cell cycle: when cells go through a cycle of growth, development, and division
Phases of the Cell Cycle	<ul style="list-style-type: none"> • Interphase: period in the cell cycle when a cell grows and develops <ul style="list-style-type: none"> • Most of a cells life is spent in interphase because cells are: <ul style="list-style-type: none"> • Growing • Replicating (making copies) of their organelles • Copying DNA (genetic information in a cell) • Preparing for cell division • Mitosis: period in the cell cycle when the cell reproduces and two new identical cells form
Length of the Cell Cycle	<p>Eukaryotic cells:</p> <ul style="list-style-type: none"> • For some cells, it might last only 8 minutes (fruit fly) • For other cells, the cycle might take as long as a year • Most dividing human cells normally complete the cell cycle in about 24 hours (human cells) • Bacteria: 20 minutes
Interphase	<ul style="list-style-type: none"> • Period of rapid growth—the cell gets bigger • Cellular activities, making proteins, copying organelles • DNA is copied <ul style="list-style-type: none"> • DNA is called chromatin: long, thin strands of DNA
Phases of Interphase	<ul style="list-style-type: none"> • G1 stage: cell grows rapidly and carries out normal cell functions • S stage: cell grows and copies its DNA <ul style="list-style-type: none"> • there are now identical strands of DNA • these identical strands of DNA ensure that each new cell gets a copy of the original cell's genetic information • G2 stage: cell grows and prepares for mitotic phase

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Organelle Replication	<ul style="list-style-type: none"> • Before a cell divides, it makes a copy of each organelle <ul style="list-style-type: none"> • this enables the two new cells to function properly • a cell produces other organelles from materials such a proteins and lipids • a cell makes these materials using information contained in the DNA inside the nucleus • Some organelles, such as the mitochondria and chloroplasts, have their own DNA
The Mitotic Phase	<ul style="list-style-type: none"> • Mitosis: the cell's nucleus and its contents divide • Cytokinesis: the cell's cytoplasm and its contents divide • Daughter cells: two new cells that result from mitosis and cytokinesis
Phases of Mitosis	
Prophase	<ul style="list-style-type: none"> • Copied chromatin coils together tightly and forms visible duplicated chromosomes • Nucleolus disappears and nuclear membrane breaks down • Spindle fibers form in the cytoplasm
Metaphase	<ul style="list-style-type: none"> • Spindle fibers pull and push the duplicated chromosomes to the middle of the cell • This arrangement ensures that each new cell will receive one copy of each chromosome
Anaphase	<ul style="list-style-type: none"> • Two sister chromatids in each chromosome separate from each other • Spindle fibers pull chromosomes apart in opposite directions • Cell begins to lengthen
Telophase	<ul style="list-style-type: none"> • Spindle fibers begin to disappear • Chromosomes begin to uncoil • Nuclear membrane forms round each set of chromosomes at either end of the cell • Two identical nuclei form

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<p>Dividing the Cell's Components</p> <p>Results of Cell Division</p> <p>Reproduction</p> <p>Growth</p> <p>Replacement</p> <p>Repair</p>	<ul style="list-style-type: none"> • Cell's cytoplasm divides <ul style="list-style-type: none"> • Animal cell: cell membrane contracts around the middle of the cell and fibers pull together to form a furrow (a crease). The furrow gets deeper and deeper until the cell membrane comes together and divides the cell • Plant cell: vesicles join together to form a cell plate which will grow outward toward the cell wall until two new cells form • 2 new cells • Both daughter cells are genetically identical to each other and to the original cell that no longer exists • Reproduction: in some unicellular organisms, cell division is a form of reproduction • Growth: cell division in humans begins 24 hours after fertilization and continues rapidly during the first few years of life • Replacement: old and damaged cells are replaced • Repair: repairs damage; broken bone will be healed through cell division of bone cells