

Key:

Important vocabulary is underlined

Main purposes of things are italicized

Heredity – the physical passing of genetic material from generation to generation

Genetics – the study of heredity and the factors that control it

Asexual Reproduction – reproduction by making an exact copy of the genetic material passed to offspring

- parent → offspring “daughter cell”
- the offspring still can be different, although there is an exact copy of the genetic material (DNA)
 - such as mutations

Cell Cycle – mitosis is one part

Mitosis – nuclear division (or nuclear ☺)

(Key is: Phase – *what the phase achieves/purpose*)

Interphase – *copy DNA*

- DNA gets uncoiled
 - chromatin – uncoiled DNA
- chromatin begin to dense/package into chromosomes
 - chromosomes – condensed/packaged chromatin
- centrioles (look like Cheetos in book) form spindle fibers

Prophase – *cell is prepped for starting to split*

- chromosomes finish forming
- centrioles move to opposite poles of the cell
- nuclear membrane begins breaking down
 - allows chromosomes to be released

Metaphase – *cell is ready to split*

- chromosomes lined up on the equator (center) of the cell
- spindle fibers attach to centromere (center of chromosome/s)
- nuclear membrane gone

Anaphase – *cell starts to split, chromosomes split*

- spindle fibers separated the centromere (center) of the chromatids, cell membrane begins

to pinch (like squeezing a balloon's center)

Telophase – *cell finishes separating*

- Nuclear membrane reforms at each end of the cells
- chromosomes uncoil
- cell membrane continues to pinch

Cytokinesis – *cell is split*

- division of the cytoplasm and organelles between the two cells
- the two cells totally separate
- they are smaller than the original precursor cell

Meiosis – produce sex cells (gametes) with half the number of chromosomes that all other cells contain

- (46 → 23, 4 → 2, 12 → 6)
- why? *2 divisions* of the precursor cell BUT only *1 copy* of the DNA

Meiosis I, Metaphase I – The only difference in the phases

- like chromosomes line up next to each other (one pair from female, one pair from male)
- homologous chromosomes – same genetic info, have same sequence of “same” DNA for a particular trait
- “crossing over” - occurs when homologous chromosomes exchange DNA to control the expression of the trait.
- *Each sex cell is genetically different because of crossing over*

Other vocabulary:

- oocyte – female precursor cell (undergoes meiosis to produce an ovum, or egg cell)
 - *Only one of the four products of meiosis from an oocyte becomes the ovum, the other three suffer from lack of cytoplasm*
- spermatocyte – male precursor cell (undergoes meiosis to produce sperm cells)