

Chapter 13

Michael Brodskiy

Instructor: Mrs. Polivka

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- Cell Division/Asexual Reproduction
 1. Produce cells with same information, identical daughter cells
 2. Exact copies or clones
 3. Same amount of DNA, same chromosomes, same information
- Pairs 1-22 are autosomes, while other pairs are sex chromosomes
- Homologous chromosomes:
 1. Paired chromosomes
 2. Both chromosomes of a pair carry “matching” genes
 3. Control same inherited characters
 4. homologous = same information
 5. Diploid means two of every chromosome ($2n$, or $2n = 4$)
- Sperm and Egg are gametes, all other cells are somatic
- Sperm and Egg are made through meiosis, and are fused in fertilization
- Gametes are haploid, $1n$ cells, which are then fertilized into diploid, $2n$ cells, which, in turn, causes meiosis to occur, creating more haploid, $1n$ cells
- Double Division of Meiosis:
 1. First Division of meiosis separates homologous pairs (reduction phase)
 2. Second Division of meiosis separates sister chromatids
- Trading pieces of DNA:
 1. In meiosis I, sister chromatids intertwine, known as “crossing over”

2. Homologous pairs swap pieces of chromosomes

- Crossing Over results in genetic variation and new traits

Mitosis	Meiosis
One division	Two divisions
New cells identical to parent	New cells different from parent
Produces 2 cells	Produces 4 cells
$2n \rightarrow 2n$	$2n \rightarrow 1n$
Produces cells for repair & growth	Produces gametes
No crossing over	Crossing over

- Value of Sexual Reproduction:

1. Introduces genetic recombination (depends on assortment of chromosomes, and alignment of traits in Metaphase 1)
2. Crossing over mixes alleles across homologous chromosomes
3. Random fertilization, as it depends on which two cells will fertilize
4. Drives evolution