

Chapter 6 Meiosis & Mendel

“Lets Talk about Sex”

Objectives

- Students will be able to identify the difference between sex cells and somatic cells and explain why these two types of cells are different.
- Students will be able to identify the number of chromosomes present in sex cells versus somatic cells.

6.1 Notes

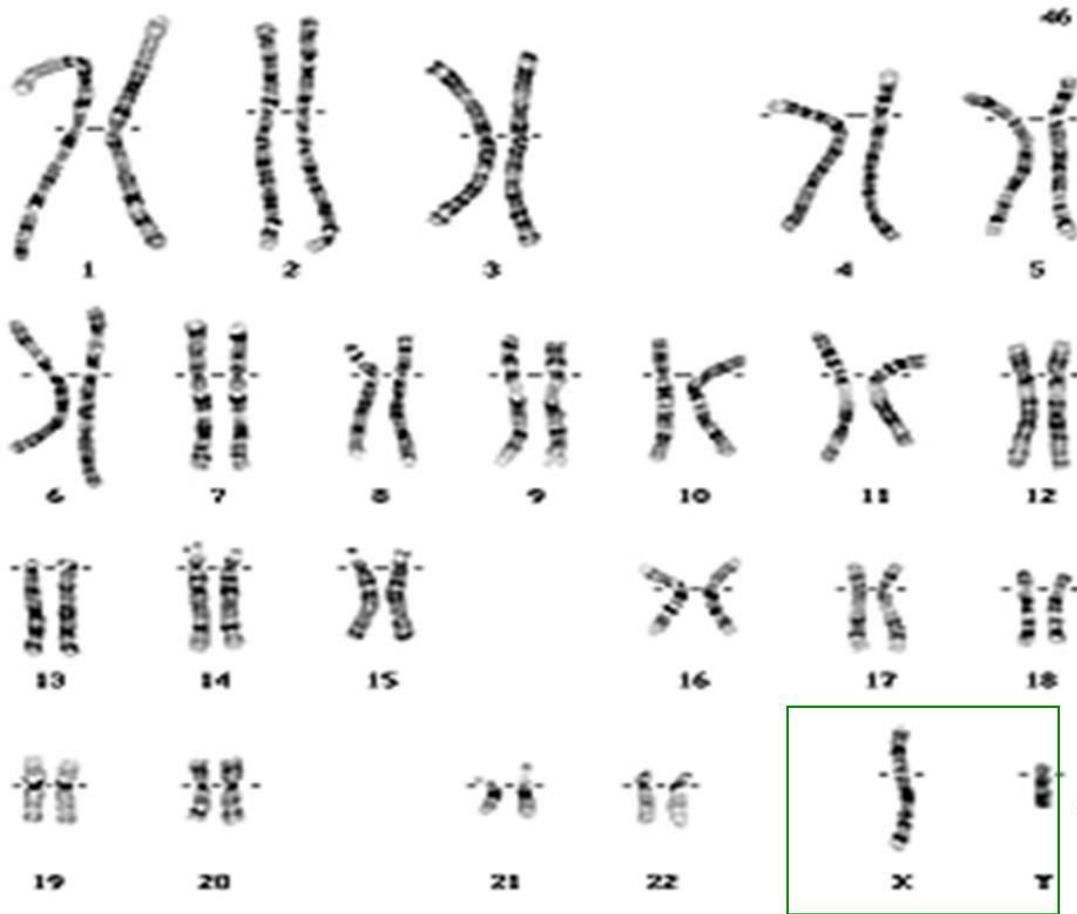
- There are body cells and gametes
 - **Somatic cells:** body cells, make up most of your body tissues and organs
 - DNA in body cells not passed on to children
 - **Gametes:** sex cells, egg in the female and sperm in the male
 - Germs cells- cells in reproductive organs (ovaries, testes) that develop into gametes.
 - DNA in gametes can be passed to children
- Each species has characteristic number of chromosomes per body cell (different for gametes typically)
 - Each body cell contains set of 46 chromosomes (23 pairs)
 - Genetically identical to each other (unless mutations)

Your body cells have autosomes and sex chromosomes

- **Homologous chromosomes:** 2 chromosomes
 - “having the same structure”
 - One from mother, one from father
 - Have copies of the same genes although the copies may be different
- Numbered from the largest chromosome to the smallest
- **Autosomes:** chromosomes numbers 1-22
 - Chromosomes contain genes for characteristics not directly related to the sex of the organism

Your body cells have autosomes and sex chromosomes

- **Sex chromosomes:** directly control the development of sexual characteristics
 - All mammals are based on the X and Y system
 - This is the 23rd pair of chromosomes
 - X and Y are paired together but they are not homologous
 - X chromosome is larger, contains many genes, even some unrelated to sexual characteristics
 - Y chromosome is smallest, carries fewest genes, contains genes in direct development of male traits



22 pairs
Autosomes

1 pair sex
chromosomes

Body cells are diploid, Gametes are haploid

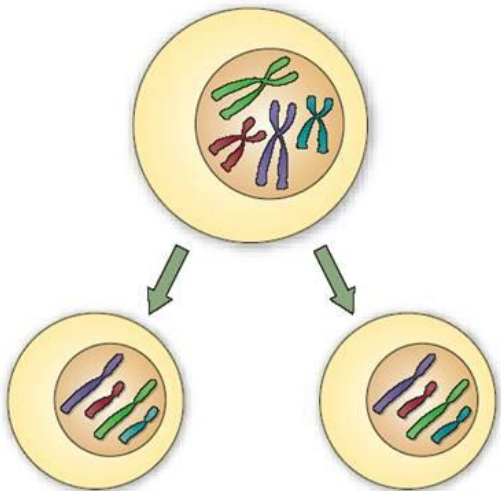
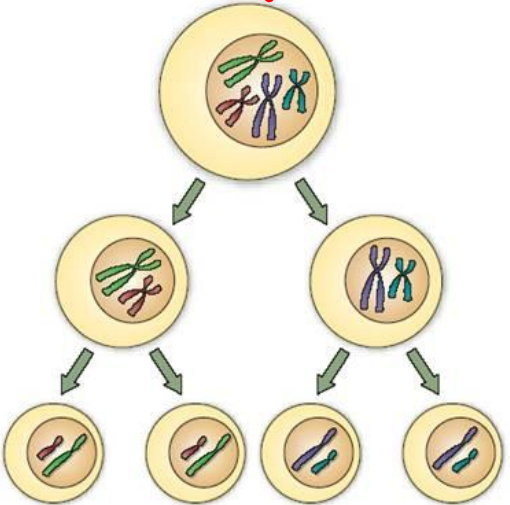
- **Sexual Reproduction:** fusion of two gametes which results in the production of offspring that are a genetic mixture of both parents
 - Fertilization: actual fusion of egg and sperm
 - Nucleus of sperm & egg fuse to form one nucleus (must have correct # chromosomes for healthy new organisms to develop)
- **Diploid:** (body cells) a cell has two copies of each chromosome
 - One from mother, one from father
 - $2n$
 - In humans, diploid number is 46
 - ***What would the haploid number be?***

Body cells are diploid, Gametes are haploid

- **Haploid:** a cell has only one copy of each chromosome
 - n
 - Human gametes
 - Egg- sex chromosome is always X; sperm can be X or Y.
- Maintaining the correct number of chromosomes is important to the survival of all organisms
 - Typically change in number is harmful, but on occasion increasing number of sets can give rise to new species
 - Played important role in plant evolution (some plants species- tetraploidy $4n$)

Intro to Meiosis

- Germ cells in reproductive organs undergo meiosis to form gametes
- Meiosis- a form of nuclear division that divides a diploid cell into haploid cells

MITOSIS	<i>Body (somatic)</i>	MEIOSIS	<i>gametes</i>
	<p>Produces genetically identical cells</p>	<p>Produces genetically unique cells</p>	
	<p>Results in diploid cells</p>	<p>Results in haploid cells</p>	
	<p>Takes place throughout an organism's lifetime</p>	<p>Takes place only at certain times in an organism's life cycle</p>	
	<p>Involved in asexual reproduction</p>	<p>Involved in sexual reproduction</p>	

6.1 Assessment

- Do 6.1 #1-6 in your notes. Title it “3/13 exit slip” I will check this tomorrow.

Meiosis

- A form of nuclear division that divides a diploid cell into haploid cells
 - Essential for sexual reproduction
- Occurs in germ cells to produce gametes
- “**reduction division**” – reduce chromosome number by half
- DNA is *copied once* but **divided twice**
- Genetically unique haploid cells form from a diploid cell

- [Khan Academy \(4 videos\)](#)
- <https://www.khanacademy.org/science/biology/cellular-molecular-biology/meiosis/v/comparing-mitosis-and-meiosis>
- <https://www.youtube.com/watch?v=16enC385R0w>
- Crash Course
<https://www.youtube.com/watch?v=qCLmR9-YY7o&index=13&list=PL3EED4C1D684D3ADF>