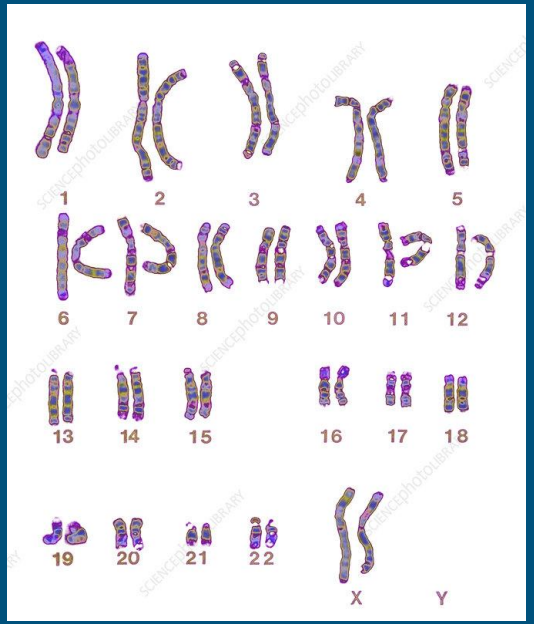
How is DNA passed down from generation to another?

6-7 PM Monday November 8th, 2021

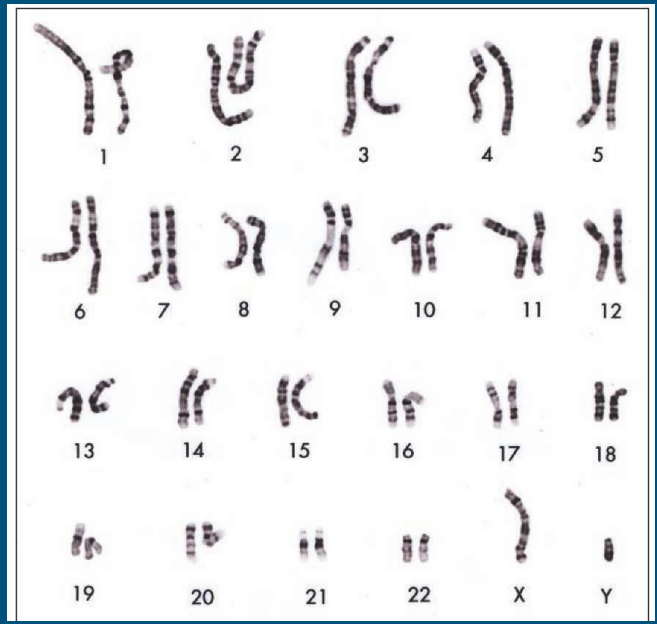
Introduction

- Chromosomes
- Meiosis
  - Meiosis I
  - Meiosis II
- Alleles
  - Dominant vs. Recessive Alleles
- Types of Inheritance

Chromosomes



- What are chromosomes
- Number of chromosomes
  - Autosomes-contain the instructions for somatic cells
    - Pairs 1-22 or the first 44 chromatids
  - Sex chromosomes- contain the instructions for reproductive cells
    - The X and Y chromosome
- Chromosomes are made up of nucleic acids and some proteins
- DNA is a polymer— the monomers of DNA are nucleotides



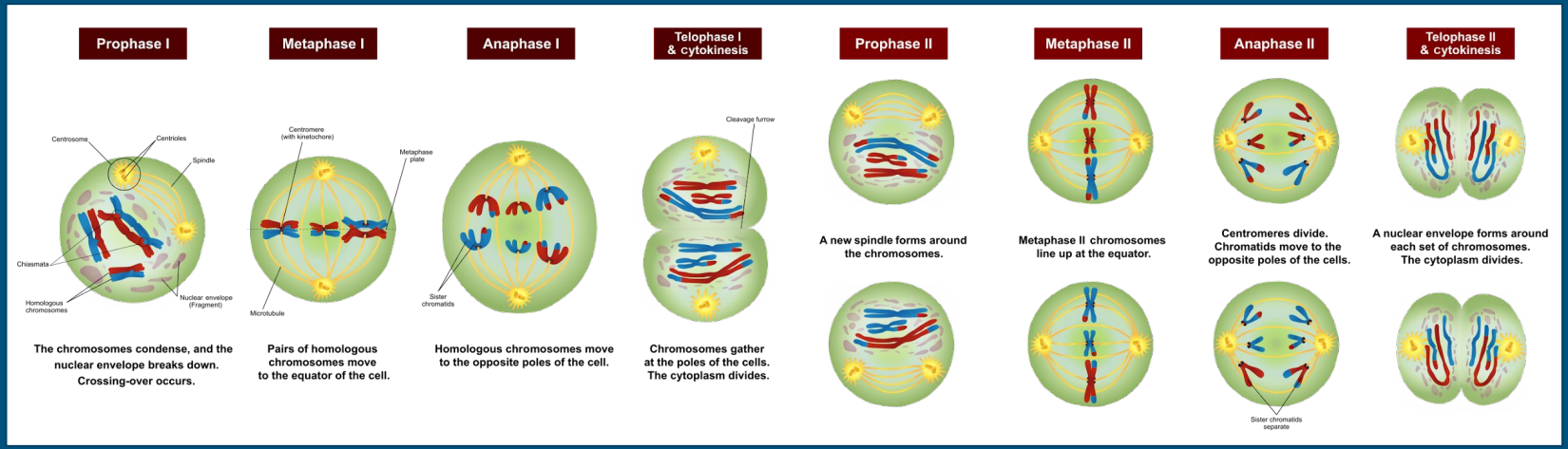
Female

Male

Chromosomes

Half of the mother’s and half of the fathers chromosomes come together to form the zygote–baby.

Meiosis Creates Gametes



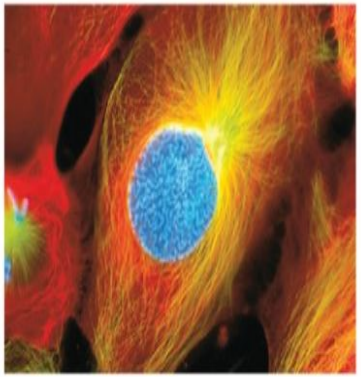
Gametes are needed to create zygotes

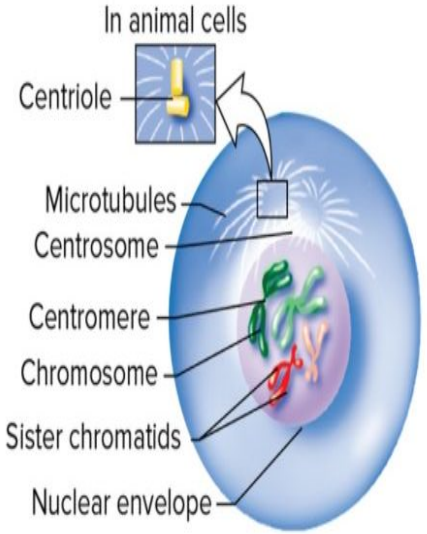
P M A T

Meiosis I - Step 1: Prophase I

Prophase I

- Chromosomes condense and thicken.
- Synaptomal complex forms
- Crossing over occurs
- Nuclear membrane dissolves.
- Spindle fibers form.

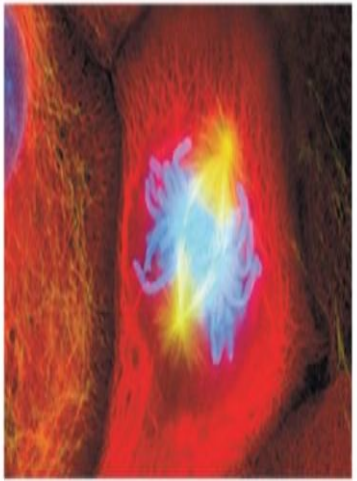


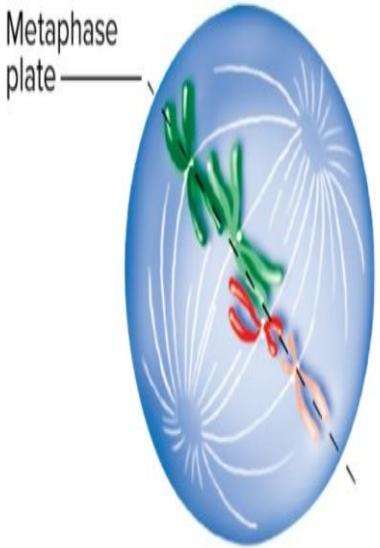


Meiosis I - Step 2: Metaphase I

Metaphase

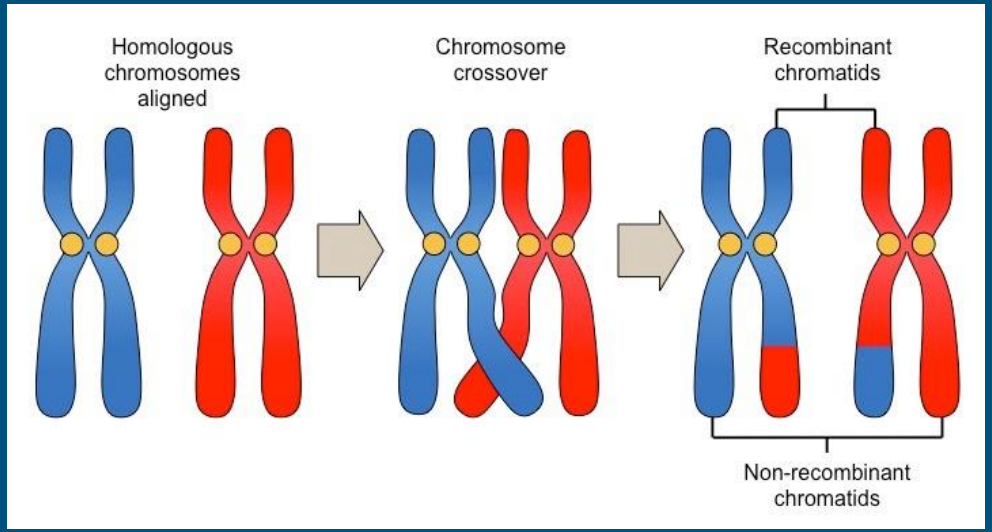
- Tetrads align on metaphase plate.
- Spindle fibers attach to chromosomes from opposite poles.
- Sister chromatids are pulled to same poles.

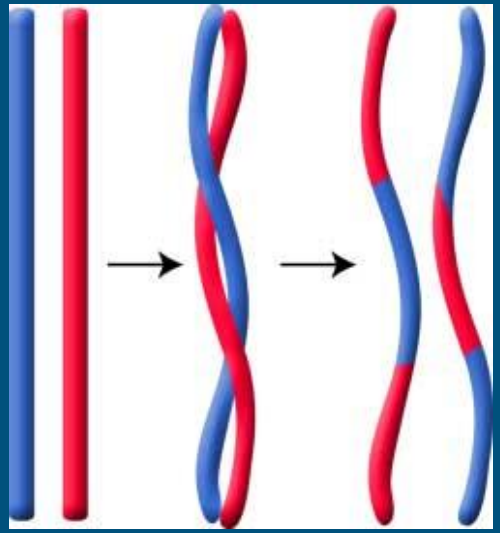




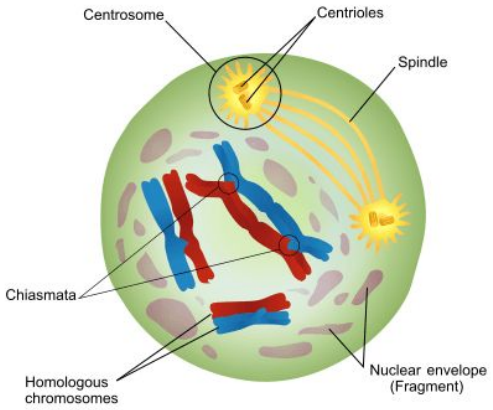
Prophase I

- Crossing over



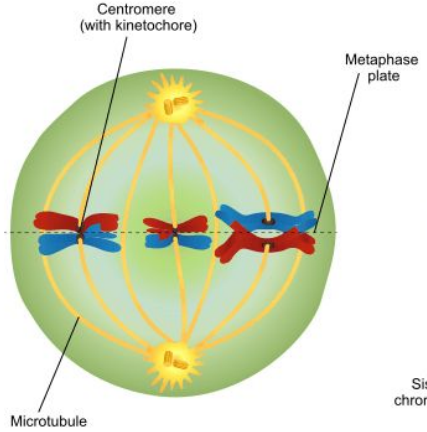


Prophase I



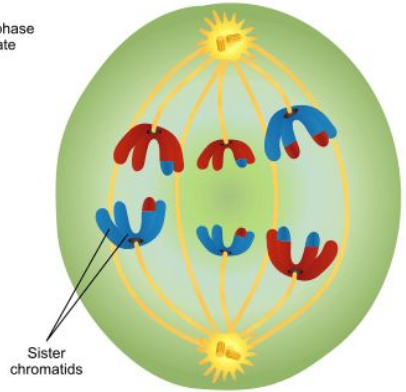
The chromosomes condense, and the nuclear envelope breaks down. Crossing-over occurs.

Metaphase I



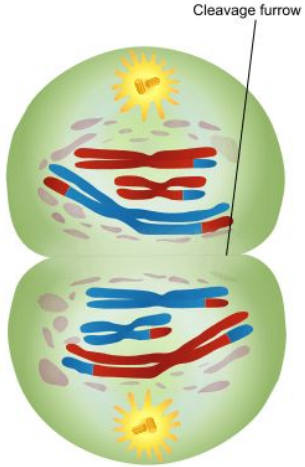
Pairs of homologous chromosomes move to the equator of the cell.

Anaphase I



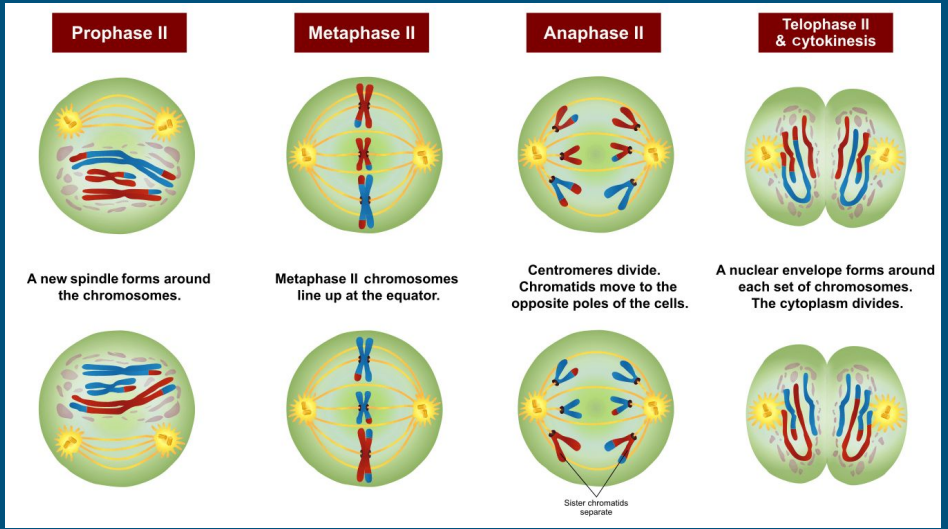
Homologous chromosomes move to the opposite poles of the cell.

Telophase I & cytokinesis



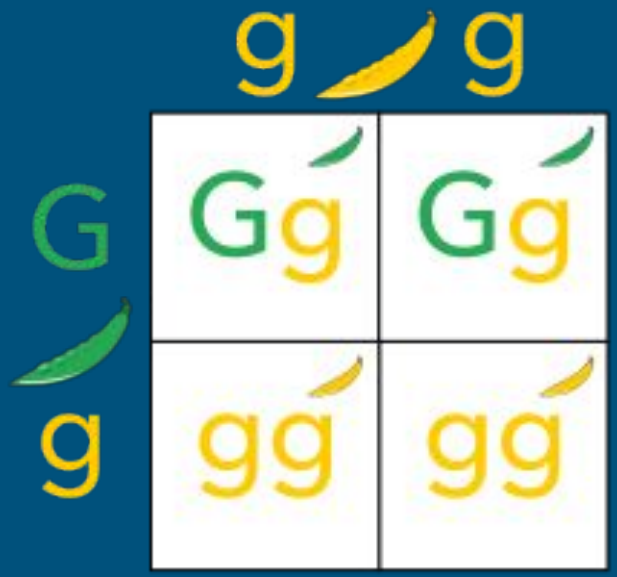
Chromosomes gather at the poles of the cells. The cytoplasm divides.

Meiosis II


Prophase II
Metaphase II
Anaphase II
Telophase II & cytokinesis
A new spindle forms around the chromosomes.
Metaphase II chromosomes line up at the equator.
Centromeres divide. Chromatids move to the opposite poles of the cells.
A nuclear envelope forms around each set of chromosomes. The cytoplasm divides.
Sister chromatids separate

Alleles

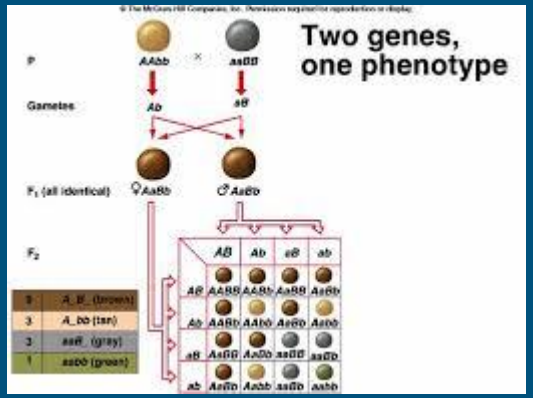
- Dominant and recessive alleles
- Punnett squares
  - Can be used to determine zygote (baby) phenotype.

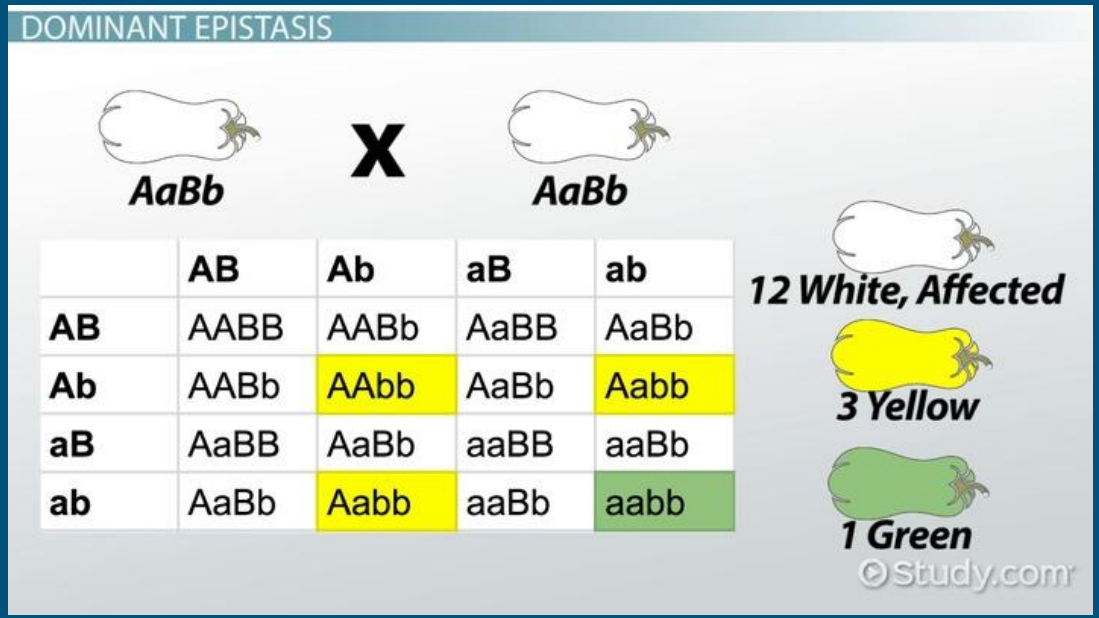


Types of Inheritance

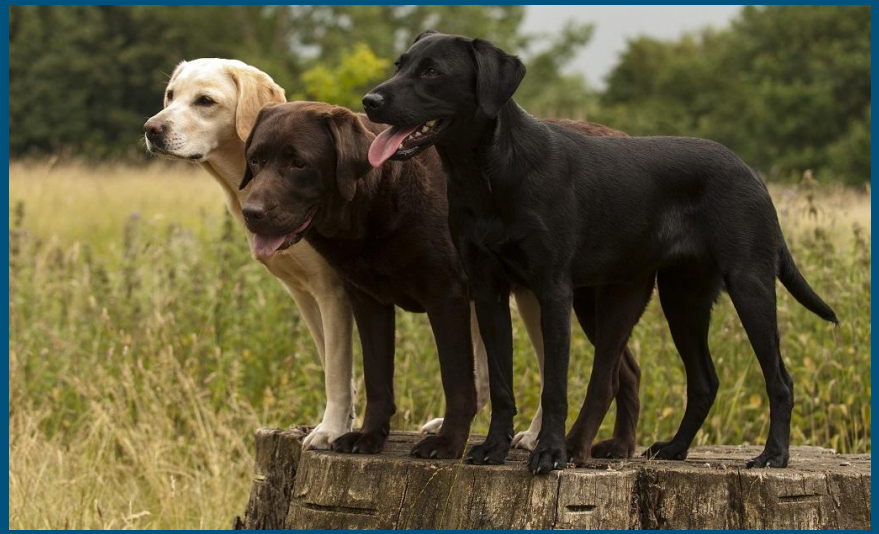
Epistasis (9:3:3:1)
Lethal Alleles
Redundancy

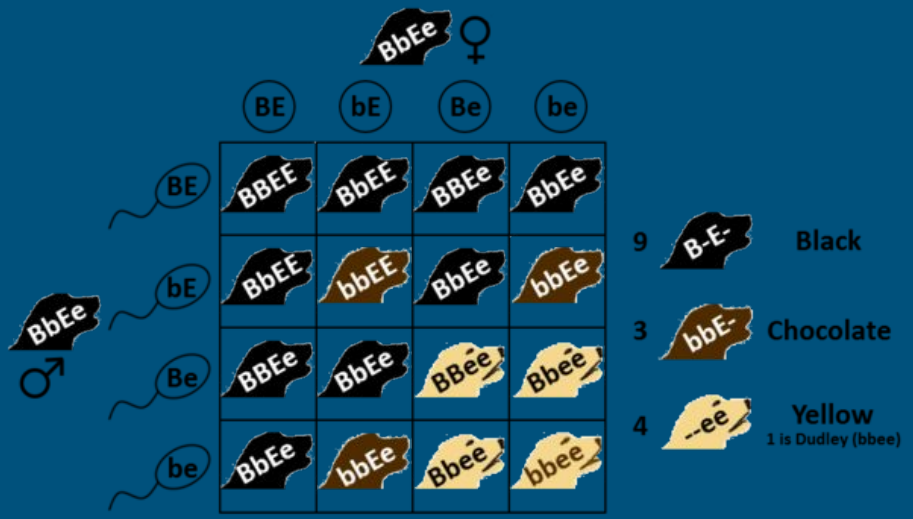
Dominant Epistasis



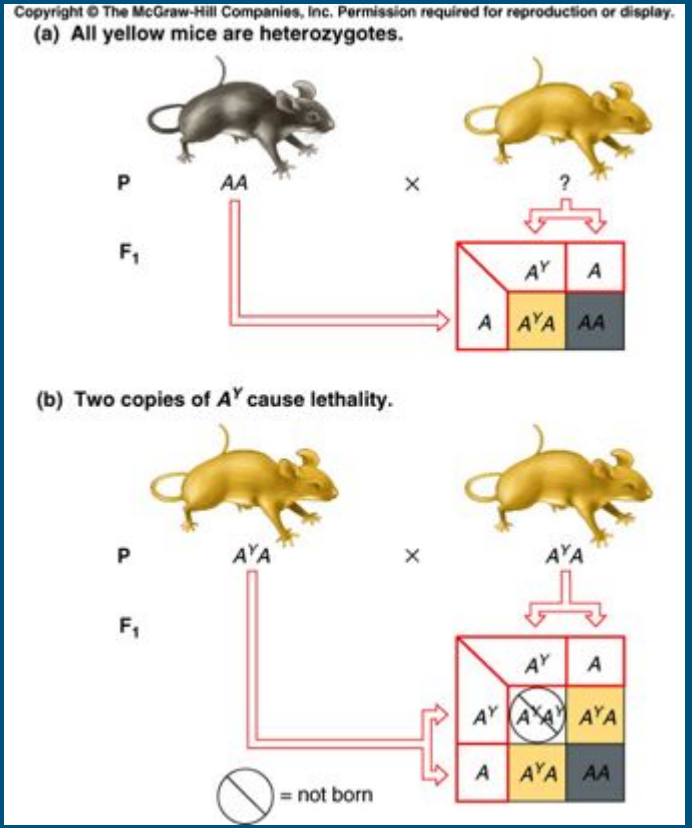


Recessive Epistasis





Lethal Alleles



Redundancy

Meiosis II - two people

Alleles - one person

Types of inheritance - two people

Conclusion - one person

Conclusion

- Chromosomes
- Meiosis
- Types of Inheritance

Definitions

Monomers make up polymers
Gametes
Zygote
Phenotype-
Genotype-

Picture Sources

Female Chromosomes

Male Chromosomes

Stages of Meiosis

Lab Coat Chart

Crossing Over

Double Cross Over

Punnett Square

Dominant Epistasis I (lentils)

Dominant Epistasis II (squash)

Meiosis I

Prophase I and Metaphase I

Meiosis II