**Pre AP Biology 11**

**CONCEPT 4:** APPLYING THE CHROMOSOMAL BASIS OF INHERITANCE TO ANALYSIS THE EFFECTS OF ALTERATIONS IN CHROMOSOME NUMBER OR STRUCTURE.

Campbell: Chapter 15 Holtzclaw: pg 111

*You must know:*

* How the *chromosome theory of inheritance* connects the physical movement of chromosomes in meiosis to Mendel’s laws of inheritance
* How alteration of chromosome number or structurally altered chromosomes can cause genetic disorders

**Alteration of Chromosome Number**

How?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Occurs when homologous chromosomes do not separate properly during meiosis II.

Result? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Incorrect number of a chromosome
  + Trisomic: three copies of the chromosome
  + Monosomic: one copy of the chromosome

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* More than two complete sets of chromosomes

**Other ways chromosome abnormalities happen**

*Mitosis*: problems with cell division

*Maternal Age*: Women are born with all the eggs they will ever have. Errors may crop up in the eggs' genetic material with age. Because men produce new sperm throughout their lives, paternal age does not increase risk of chromosome abnormalities.

*Environment*: No conclusive evidence however it is still possible that the environment may play a role in the occurrence of genetic errors.

**Most common non disjunction in humans**

Trisomy 21:

Trisomy 18:

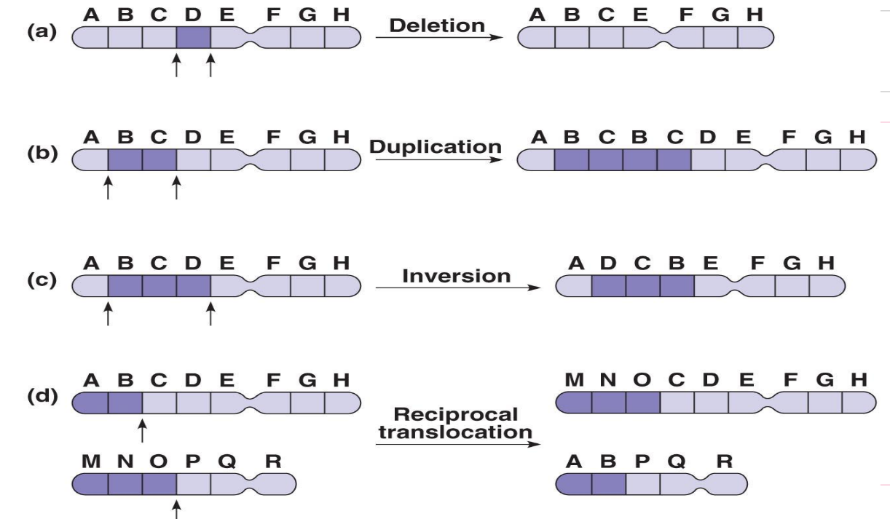
Trisomy 13:

**Sex Chromosome Aneplodiy**

XXY

XYY

XXX

**Rearrangement of Chromosome Structure**

Portions of a chromosomes may be \_\_\_\_\_\_or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during crossing over

* Deletion: Fragment is lost.  Missing \_\_\_\_\_\_\_\_\_\_\_\_.
* Duplication: Extra fragment.  \_\_\_\_\_\_\_\_\_\_\_ genes.
* Rings**:** A portion of a chromosome has broken off and formed a\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This can happen with or without loss of genetic material.
* Inversion: \_\_\_\_\_\_\_\_\_\_\_\_section! May affect genes.
* Translocation: Moving a piece to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_chromosome.

Example: