<u>**CONCEPT:**</u> CHROMOSOMAL MUTATIONS: ANEUPLOIDY

● **Chromosomal mutations** describe alterations in chromosome structure or number of chromosomal copies

    □ There are two _____ of chromosomal mutations

        1. **Aberrant euploidy** refers to changes in the whole set of chromosomes

   2. **Aneuploidy** refers to changes in parts of a single, or few chromosomes

<u>Aneuploidy</u>

● **Aneuploidy** refers to organisms with chromosomes mutations found in some chromosomes, but not all

    □ There are many different _____ of aneuploidy

        - **Trisomic** (2n +1) : Example includes Down Syndrome and Klinefelters

        - **Monosomic** (2n -1) : Example includes turner syndrome

        - **Nullsomic** (2n – 2) : More rare than other types

        - **Disomic** (n +1) : Occurs in haploids

EXAMPLE:

Trisomic (2n +1)   Monosomic (2n -1)   Nullsomic (2n -2)   Disomic (n +1)
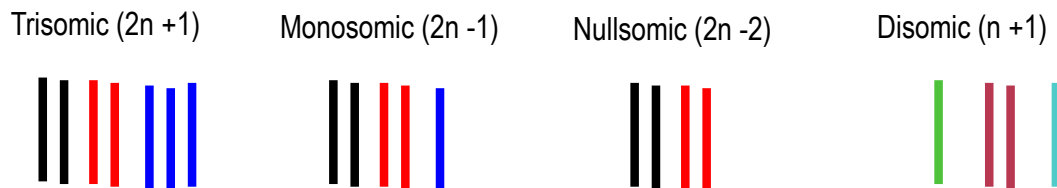
    □ **Nondisjuction,** which is the failure of chromosomes to separate properly during division, causes aneuploidy

        - Can occur in meiosis (most common) or early development mitosis (less common)

    □ Aneuploids are usually more abnormal that polyploids

        - **Gene balance**, which is the ratio of genes on one chromosome to genes on other chromosome

        - **Gene dosage**, which is the relation between numbers of gene copies and the amount of gene product

            - Dosage is more severe when there is a aberrant dose of a few vs. aberrant dose of all genes

EXAMPLE:

Trisomic (2n +1)   Triploid (3n)

More Abnormal   Less Abnormal
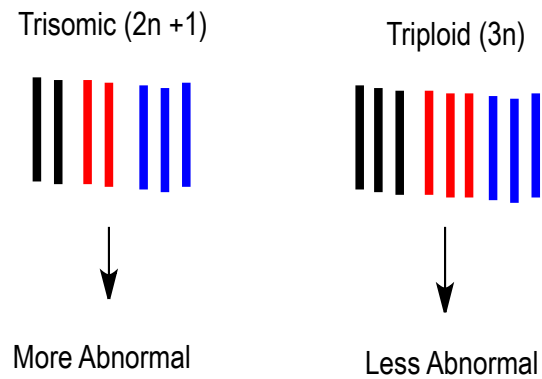
PRACTICE

1. Which of the following chromosomal mutations increases the amount of genetic material from only some chromosomes?
   a. Aberrant Euploidy
   b. Aneuploidy
   c. Monoploidy
   d. Tetraploidy

2. True or False: Aneuploids are more abnormal that polyploids
   a. True
   b. False

3. A species has 2n = 20. How many chromosomes will be found per mutant cell in an monosomic organism.
   a. 10
   b. 19
   c. 20
   d. 21