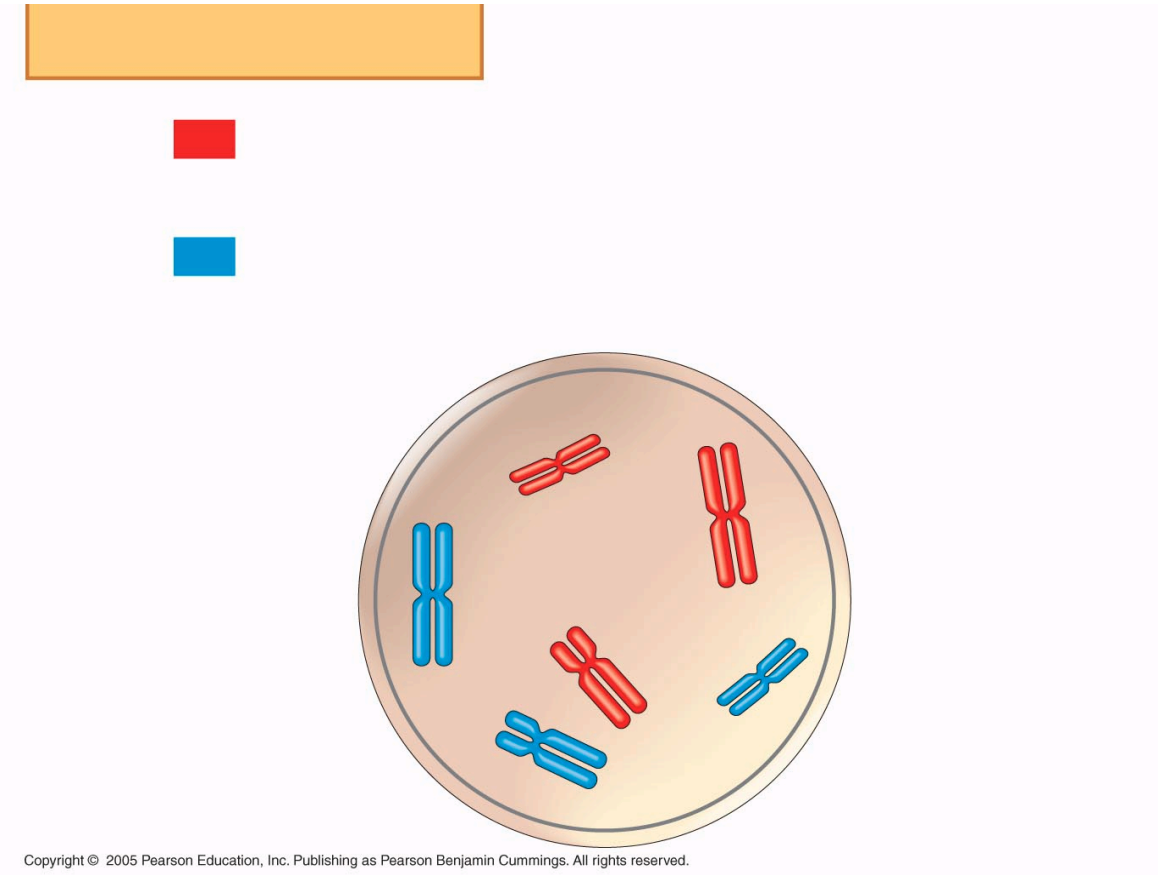
Unit 2: Cellular Organization and Processes

Section 2-7: Meiosis
Book Reading: Chapter 13 pages 238-249

Introduction to Genetics

- Genetics- *define*
  - Heredity- *define*
  - Gene
    - *define*
    - Segments of DNA that code for a specific trait
  - Locus- *define*

- Homologous Chromosomes
  - Homologous chromosomes are pairs of chromosomes with specific similarities
    - *list*
    -
    -
  - Homologous chromosomes carry genes controlling the same
  - Humans have
    -
    -
  - Not the same thing as
  - Karyotype- *define*
  -
  - Two Types of Chromosomes
    - Autosomes- *define*
    - Sex Chromosomes
      - *list*
      - Determine gender
        - XX=
        - XY=
      - Can also contain



- ❖ Two Types of Cells
  - Somatic cells
    - ▪
    - ▪ All cells except *what two kinds of cells*
    - ▪ Produced via *what process*
    - ▪ Diploid cells
      - Diploid number of chromosomes
      - For humans 2n=
  - Gametes
    - ▪ Sex cells
    - ▪ *What two kinds of cells specifically*
    - ▪ Produced via *what process*
    - ▪ Haploid cells
      - Haploid number of chromosomes
      - For humans n=

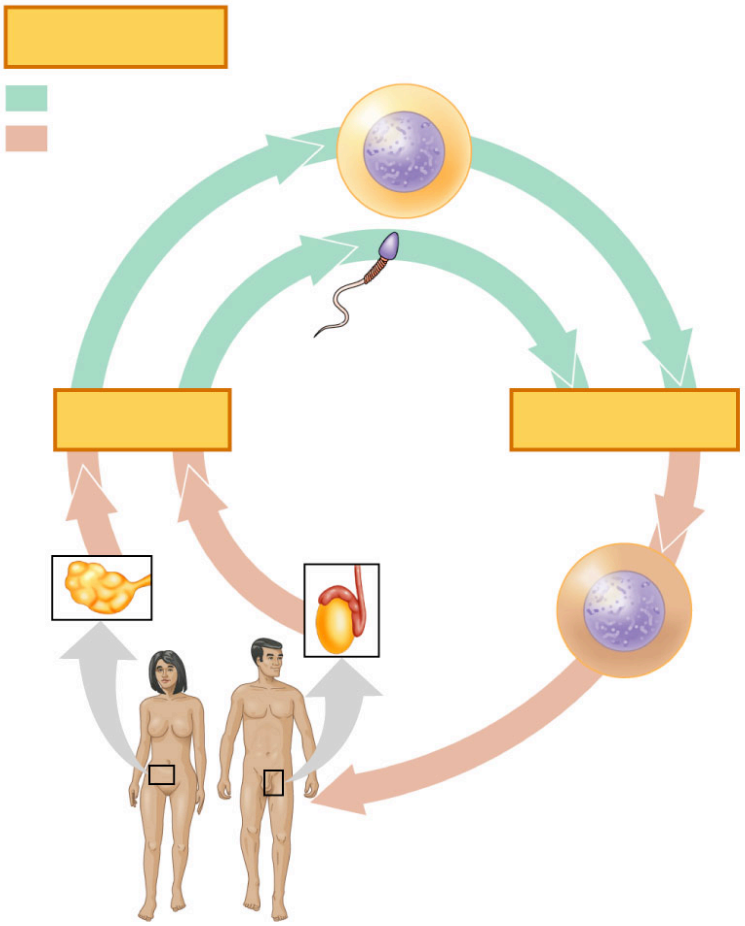
<u>Asexual vs. Sexual Reproduction</u>

- ❖ Asexual Reproduction
  - Only
  - Offspring are *how do they compare to the parent organism* (unless there is random DNA mutation)
  - All cell divisions are
  - Advantages
    - ▪
    - ▪
    - ▪
  - Disadvantage
    - ▪ No variation=

- Examples:
  -
  -

❖ Sexual Reproduction
- Two parents-
- Offspring contain a mixture of DNA,
- Occurs via specialized cells called
- Gametes undergo
- Advantages:
  - Variation=
- Disadvantages:
  -
  -
  -

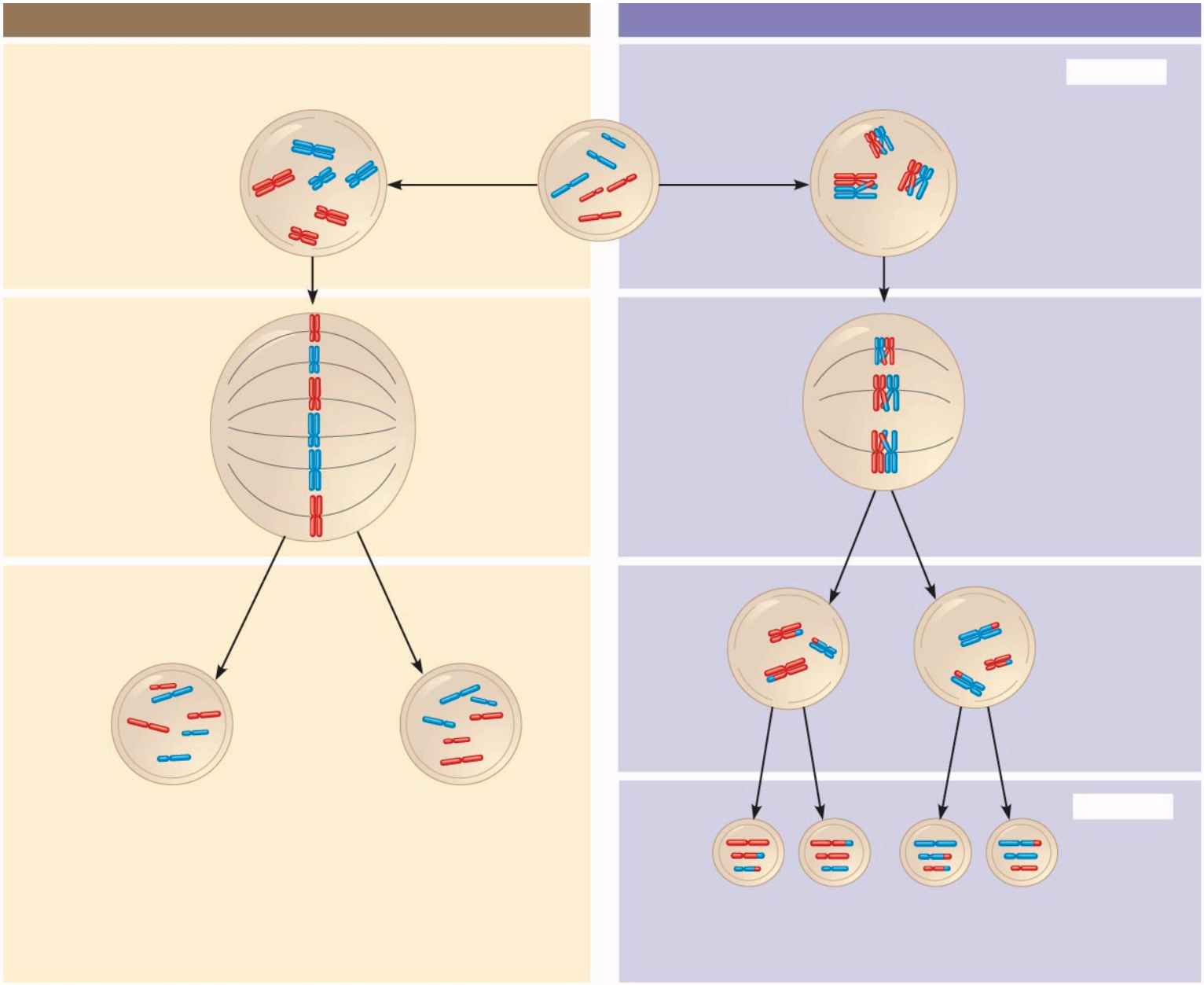
❖ The Human Sexual Life Cycle
- Life cycle-
  - Conception
  - Growth/development
  - Meiosis
  - Haploid gametes
  - Fertilization
    -
    - Resulting structure=



Meiosis

- Interphase
  - Chromosomes are replicated
- Prophase I
  - Nuclear membrane disappears
  - Synapsis occurs
    -
    -
  - Tetrads form
    -
    - Chiasmata are visible-
- Metaphase I
  - Homologous chromosomes
- Anaphase I
  - Homologous chromosomes
- Telophase I/Cytokenisis I
  -
  -
  - Cells are now *diploid or haploid*
  - Each chromosome
- Prophase II
- Metaphase II
  - Chromosomes line up at the
- Anaphase II
  -
- Telophase II/Cytokenisis II
  - *How many new cells are formed*
  - *Are they identical or genetically unique*
  - Each cell has *how much of the original DNA?*

Mitosis vs. Meiosis



Origins of Genetic Variation

- ❖ Independent Assortment of Chromosomes
  - •
  - •
  - •
- ❖ Crossing Over
  - •
  - •
- ❖ Random Fertilization
  - •
  - •
  - •
  - •