* Meiosis
  + Meiosis I
    - Prophase I
      * Leptotene: chromosomes contract and become visible
      * Zygotene: chromosomes continue to condense , homologous chromosomes pair
        + Synapsis: close pairing association to create bivalents (aka tetrads)
      * Pachytene: chromosomes become shorter and thicker
        + synaptonemal complex
      * Diplotene: crossing over
        + Chiasmata form
      * Diakinesis: nuclear membrane breaks down
    - Metaphase I: homologous pairs of chromosomes align along metaphase plate
    - Anaphase I: separation of homologous chromosomes
    - Telophase I: chromosomes are pulled apart and cytoplasm divides
  + Meiosis II
    - Interkinesis: nuclear membrane reforms around chromosomes
    - Prophase II: interkinesis reversed
    - Metaphase II: chromosomes line up on metaphase plate, pulled to opposite poles
    - Telophase II: chromosomes separated, nuclear envelope reforms, cytoplasm divides.
* Sources of Genetic Variation in Meiosis
  + Crossing Over: exchange of genetic material between nonsister chromatids
    - Sister chromatids no longer identical
    - Intrachromosomal recombination: create new combinations of alleles on chromatids
  + Random Separation of Homologous Chromosomes
    - Number of possible combinations based on separation = 2n where n = number of homologous pairs
* The Separation of Sister Chromatids and Homologous Chromosomes
  + Cohesin: protein that holds chromatids together
  + Meiosis-specific cohesin along entire length of chromosome arm
* Meiosis in the Life Cycles of Animals and Plants
  + Meiosis in Animals
    - Spermatogenesis: in testes
      * Spermatogonia: diploid germ cells in testes
      * Primary spermatocyte: spermatogonia in prophase I
      * Secondary spermatocyte: spermatogonia that undergoes meiosis II
      * Spermatids: haploid cells in testes which develop into sperm
      * Spermatogenesis takes place over the course of a male’s life
    - Oogenesis: in ovaries
      * Oogonia: diploid germ cells in ovaries
      * Primary oocyte: oogonia in prophase I
      * Secondary oocyte: oogonia that undergoes meiosis II
      * First polar body: smaller cell in first division (unequal cytokinesis division)
      * Ovum: larger cell in division of secondary oocyte (only one produced per oogonia)
      * Second polar body: smaller cell in second division
      * Oogenesis takes place for a small period of time in a female’s life, leaving a limited number of ova
  + Meiosis in Plants
    - Alternation between sporophyte and gametophyte generations
      * Alternation of generations
      * Sporophyte produces haploid spores with meiosis
      * Gametophyte produces haploid gametes with mitosis
    - Sporophyte is vegetative part of plant
    - Gametophyte is a few haploid cells within sporophyte
    - Flower contains reproductive structures
      * Male: stamen
        + Produces microsporocytes to make microspores
      * Female: ovary
        + Contains megasporocytes to produce megaspores (only one survives)
    - Plant flower: stamens open and release pollen
      * Pollen lands on stigma (platform on top of style)
      * Germinates and grows tube down style into ovary
      * Sperm cells go down tube and fertilize egg