MEIOSIS (Production of sex cells or gametes)

Meiosis begins with a body cell or somatic cell that has the diploid (2n) number of chromosomes and ends by creating 4 haploid (n) sex cells or gametes.

NON-DIVIDING CELL

INTERPHASE (only one time at very beginning of cell cycle)

G1: CELL GROWS IN SIZE
  CELL ORGANELLES DOUBLE IN #, CENTRIOLES DOUBLE IN #

S: DNA REPLICATION OCCURS FORMING SISTER CHROMATIDS

G2: CELL CONTINUES TO GROW IN SIZE AND MAKES FINAL PREPARATIONS FOR DIVISION

MEIOSIS I (1st Division)

PROPHASE I
- centrioles move toward poles
- spindle fibers begin to form
- nuclear envelope fragments, nucleolus disappears (nucleus disappears)
  - homologous chromosomes each having 2 sister chromatids pair up (Synapsis)
  - crossing over between non-sister chromatids occurs and leads to genetic recombination

METAPHASE I
- centrioles are at the poles
- spindle fibers attach to centromeres
  - homologous chromosome pairs line up side-by-side at equator
  - homologous chromosome pairs line up randomly by independent assortment (leads to genetic variety in the sex cells)

ANAPHASE I
  - homologous chromosomes separate and are pulled to opposite poles by spindle fibers

TELOPHASE I
- nuclear envelope reforms and nucleoli appear (nuclei reform at each pole of cell)
- 2 cells with haploid #
- Cytokinesis occurs and splits the cell into two haploid cells
- Centrioles double in #
MEIOTIC II (JUST LIKE MITOSIS! (2nd Division))

PROPHASE II
- cells have one chromosome from each homologous pair
- centrioles begin to move to poles
- spindle fibers begin to form
- nuclear envelope fragments, nucleolus disappears (nucleus disappears)

METAPHASE II
- centrioles are at the poles
- spindle fibers attach to centromeres of chromosomes
- chromosomes line up at the equator in a straight line

ANAPHASE II
- sister chromatids separate becoming daughter chromosomes that move to poles

TELOPHASE II
- spindle apparatus disappears
- nuclei reform around chromosomes
- cytokinesis occurs

RESULT: 4 HAPLOID CELLS (n=2) each with 2 centrioles
= gametes or sex cells

Each sex cell (gamete) is different and has 2 chromosomes