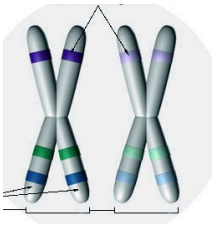
Bio I
Notes: Meiosis

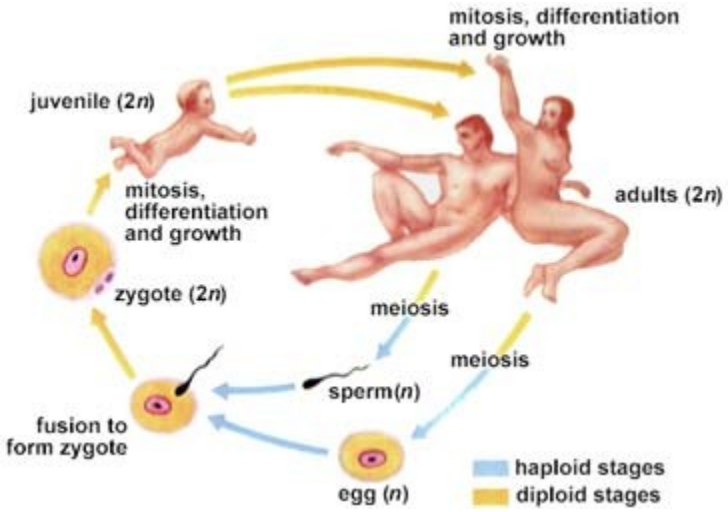
Relate the following words to one another: allele, DNA, chromosome, gene

Structure of a chromosome (terms: centromere, sister chromatids, homologous chromosomes)



Haploid vs. Diploid:

History of your life:

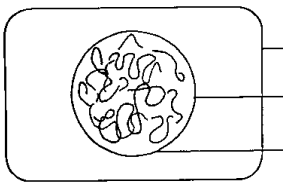


Purpose of meiosis:

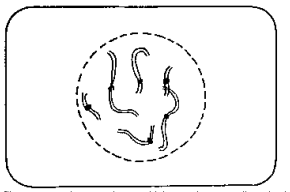
To reduce the normal chromosome number in half.
Ex. Humans have 46 chromosomes to reduce to 23

Stages of meiosis:

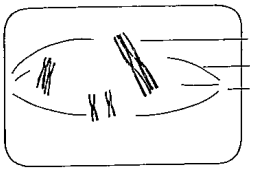
- *Interphase*:
  - Haploid or Diploid**: 2n**
  - Process:
    - **synthesis ~ DNA replication occurs ,creating sister chromatids**



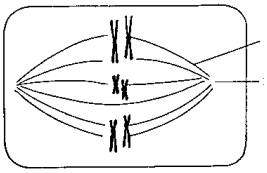
- *Early Prophase I*:
  - Haploid or Diploid**: 2n**
  - Process:
    - **Nuclear membrane disappears**
    - **Chromatin condenses; chromosomes form.**



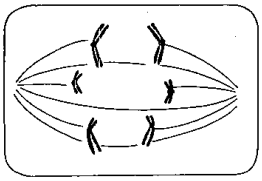
- *Late Prophase I*:
  - Haploid or Diploid**: 2n**
  - Process:
    - Homologous pairs form a tetrad (homologous pairs with sister chromatids)
    - Crossing over occurs- sister chromatids exchange DNA which increases variation
    - Spindle fibers appear



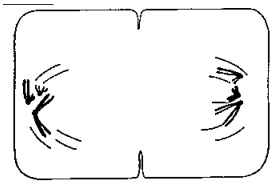
- *Metaphase I*:
  - Haploid or Diploid: **2n**
  - Process:
    - Spindle fibers attach to centomere of homologous chromosomes
    - Homologous pairs pulled to equator of cell



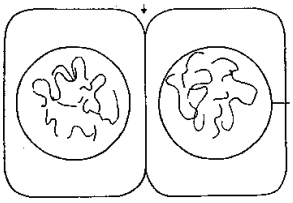
- *Anaphase I*:
  - Haploid or Diploid: **2n**
  - Process:
    - **Spindle fibers shorten and begin to separate homologous pairs**



- *Telophase I*:
  - Haploid or Diploid: **n**
  - Process:
    - **homologous pairs separated and pulled to opposite poles**
    - **cleavage furrow forms separating cells**



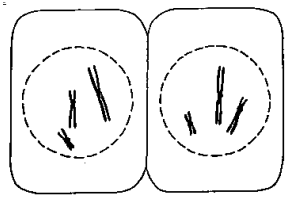
- *Interkinesis*:
  - Haploid or Diploid: **n**
  - Process:
    - **some species form nuclear membrane and chromosomes relax to form chromatin**



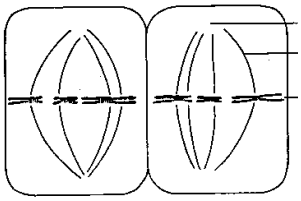
(Meiosis II- looks exactly like mitosis)

- *Prophase II*:
  - Haploid or Diploid: **n**

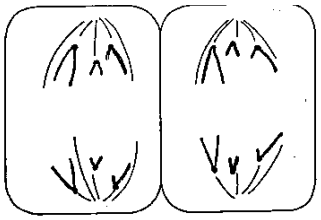
- Process:
  - **Condense chromatin to form chromosomes (sister chromatids)**
  - **Centrioles migrate to poles**
  - **Spindle apparatus forms**



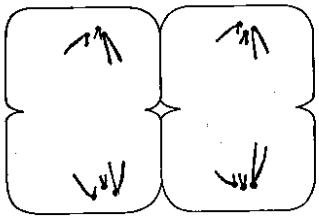
- *Metaphase II*:
  - Haploid or Diploid: **n**
  - Process:
    - **Sister chromatids align at equator**
    - **Spindle attaches to centromere**



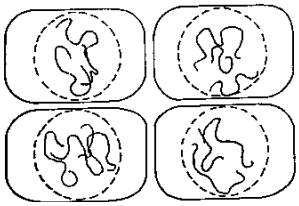
- *Anaphase II*:
  - Haploid or Diploid: **n**
  - Process:
    - **Sister chromatids are separated and pulled to opposite poles**



- *Telophase II*:
  - Haploid or Diploid: **n**
  - Process:
    - **Sister chromatids are at poles**
    - **Cleavage furrow form**s
    - **Cytokinesis forms 4 haploid cells**



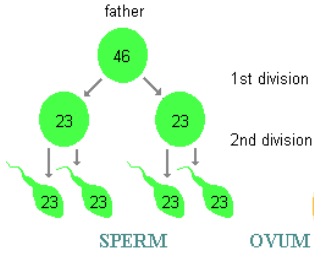
Results of Meiosis I and II:
Four gametes form (haploid cells)



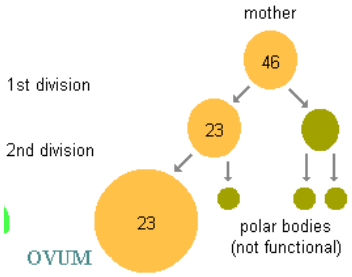
Difference between Meiosis I and Meiosis II:
Miosis I – homologous chromosomes separate forming haploid cells
Miosis II- sister chomatids separated forming FOUR cells

Gamete production:

- Males:



- Females:



Difference between meiosis and mitosis:

Helpful websites:

- http://www.biology.arizona.edu/cell_bio/tutorials/meiosis/main.html – Meiosis tutorial
- http://www4.ncsu.edu/unity/users/b/bnchorle/www/ - Meiosis tutorial
- http://www.trentu.ca/biology/101/14.html – Meiosis animation