

# Meiosis

Sexual Reproduction

Specialized type of Cell Division

# Meiosis

- Reduces the number of chromosomes by half
- Results: Takes a diploid cell and produces 4 haploid cells

# What types of cells does Meiosis produce?

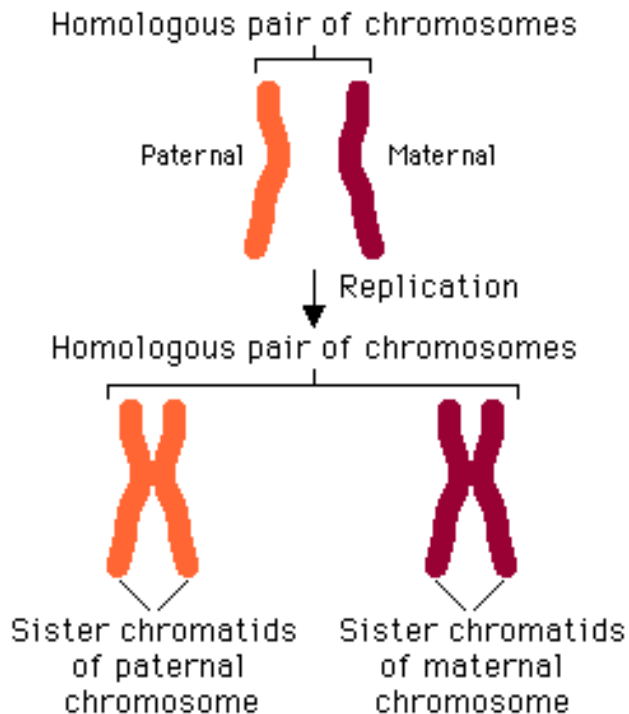
- Gametes – sex cells
  - i.e. sperm and egg cells

# Meiosis

- Involves two distinct divisions:
  - Meiosis I
  - Meiosis II
- Prior to Meiosis I, each chromosome is replicated during Interphase

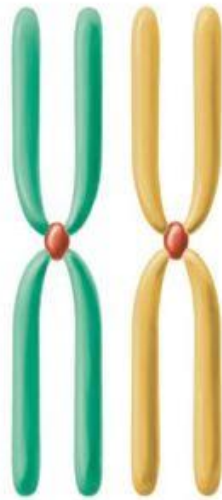
# Meiosis Differences:

- Meiosis I
  - Prophase I
    - Each chromosome pairs with its corresponding homologous chromosome forming a tetrad
      - Homologous – 1 chromosome of the pair comes from the mom, one comes from the dad



# Meiosis Differences:

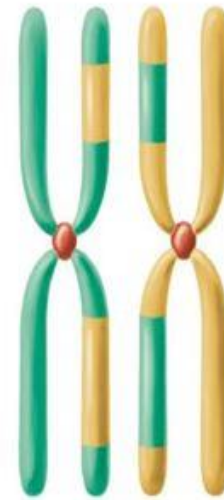
- Meiosis I
  - Prophase I
    - As tetrads are formed, they exchange portions of their chromatids  
= CROSSING-OVER
    - The chromosomes wrap around each other and exchange alleles



homologous  
chromosome  
pair

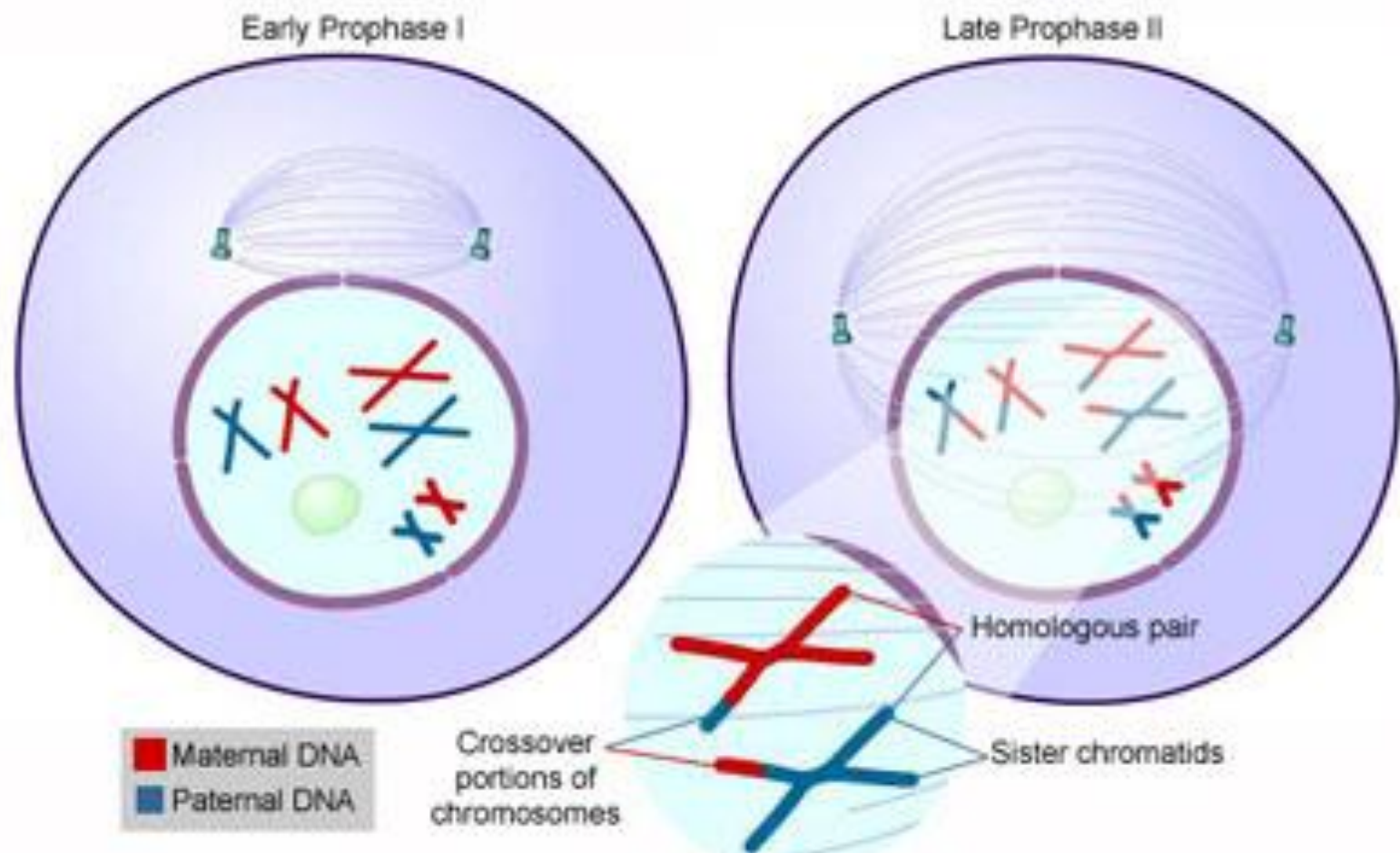


As the chromosomes  
move closer together,  
synapsis occurs.



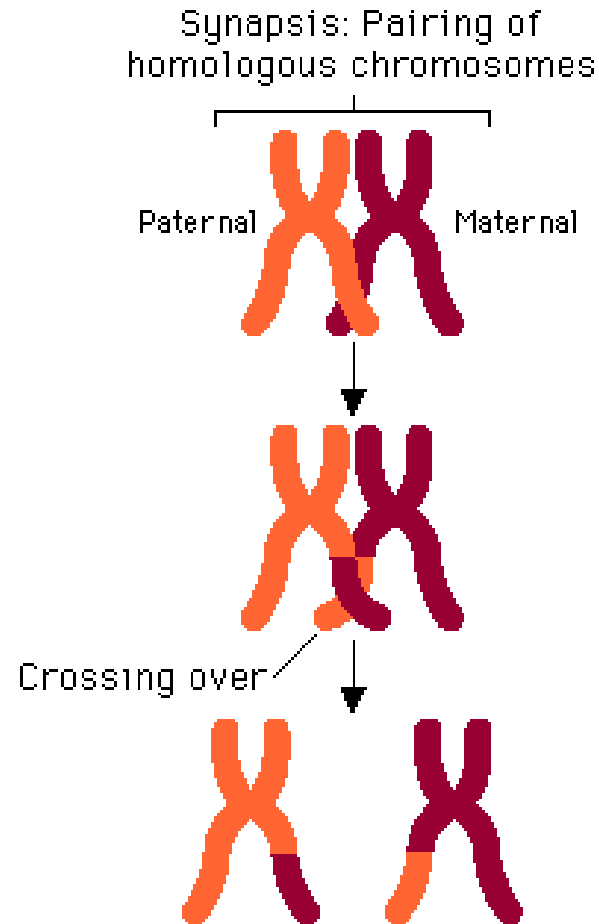
Chromatids break,  
and genetic information  
is exchanged.

Figure B-18: Meiosis, Prophase I



The exchange of genetic material by crossing over results in new combinations of maternal and paternal alleles.

# Crossing-over results in increased genetic variation!!!



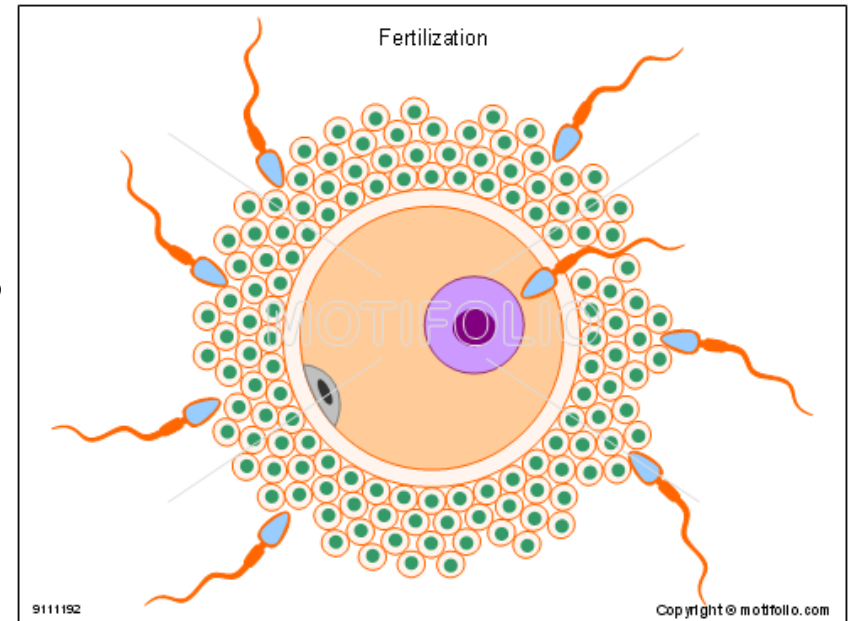


# End of Meiosis I

- Results: 2 diploid daughter cells
- These cells now undergo a 2<sup>nd</sup> meiotic division

# Meiosis II produces 4 haploid cells

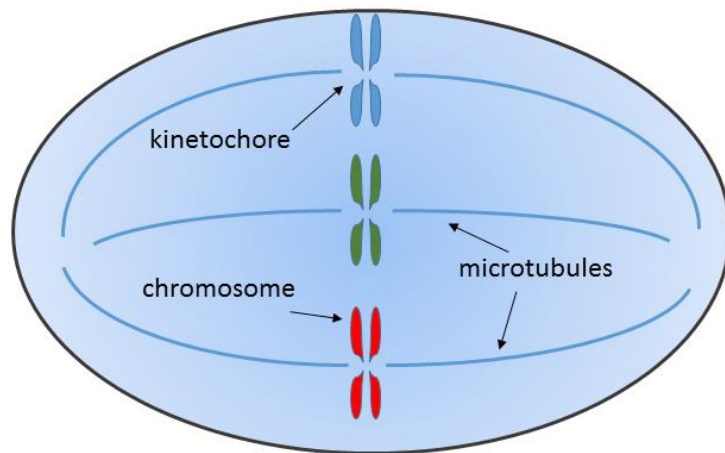
- How do they get restored to diploid cells?
  - **FERTILIZATION**
    - Haploid sperm joins with the haploid egg
    - forms a diploid Zygote



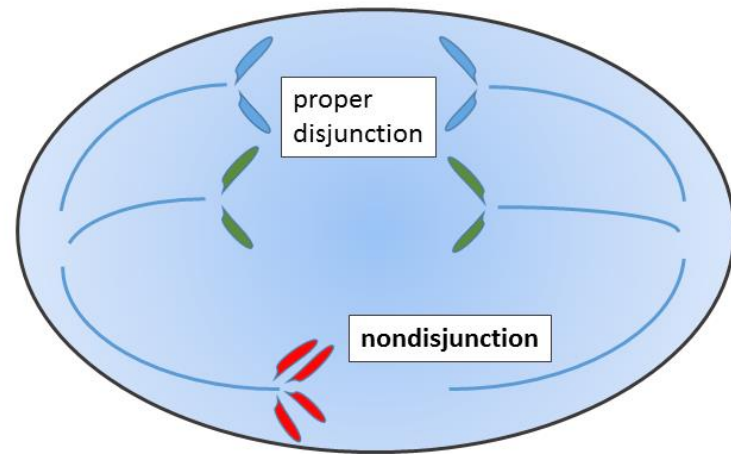
# What happens if the homologous chromosomes do not separate properly during anaphase?

= NON-DISJUNCTION

- Results in the zygote having too many or too few chromosomes



metaphase



anaphase