

Meiosis and Sexual Reproduction

Mitosis

- produce cells with same information
 - identical daughter cells
- exact copies
 - _____
- same amount of DNA
 - same _____
 - same _____

Asexual Reproduction

- Single-celled eukaryotes
 - yeast (fungi)
 - Protists
- Simple multicellular eukaryotes
 - *Hydra*

Advantages?

Disadvantages?

Karyotype:

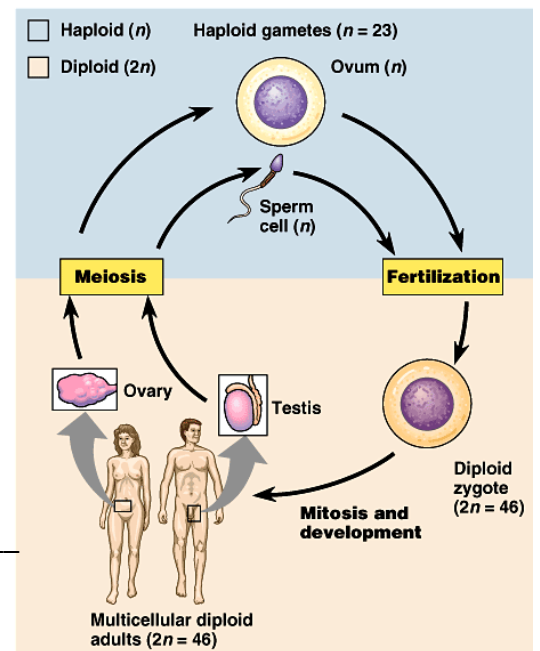
Homologous Chromosomes:

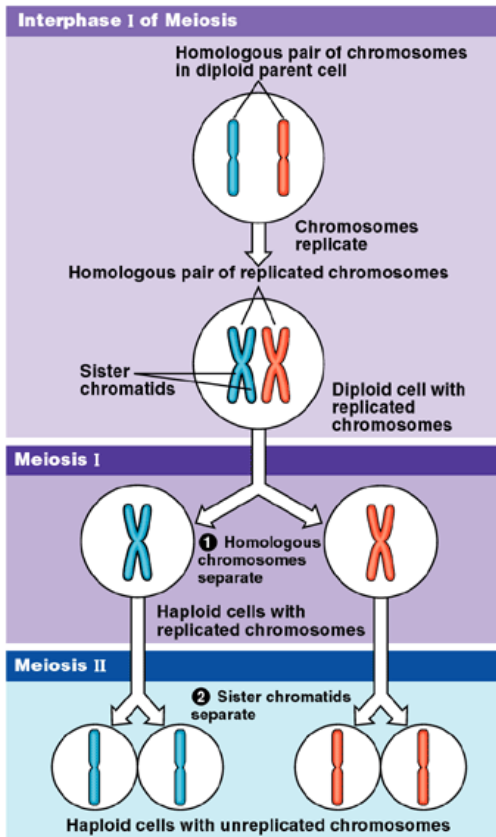
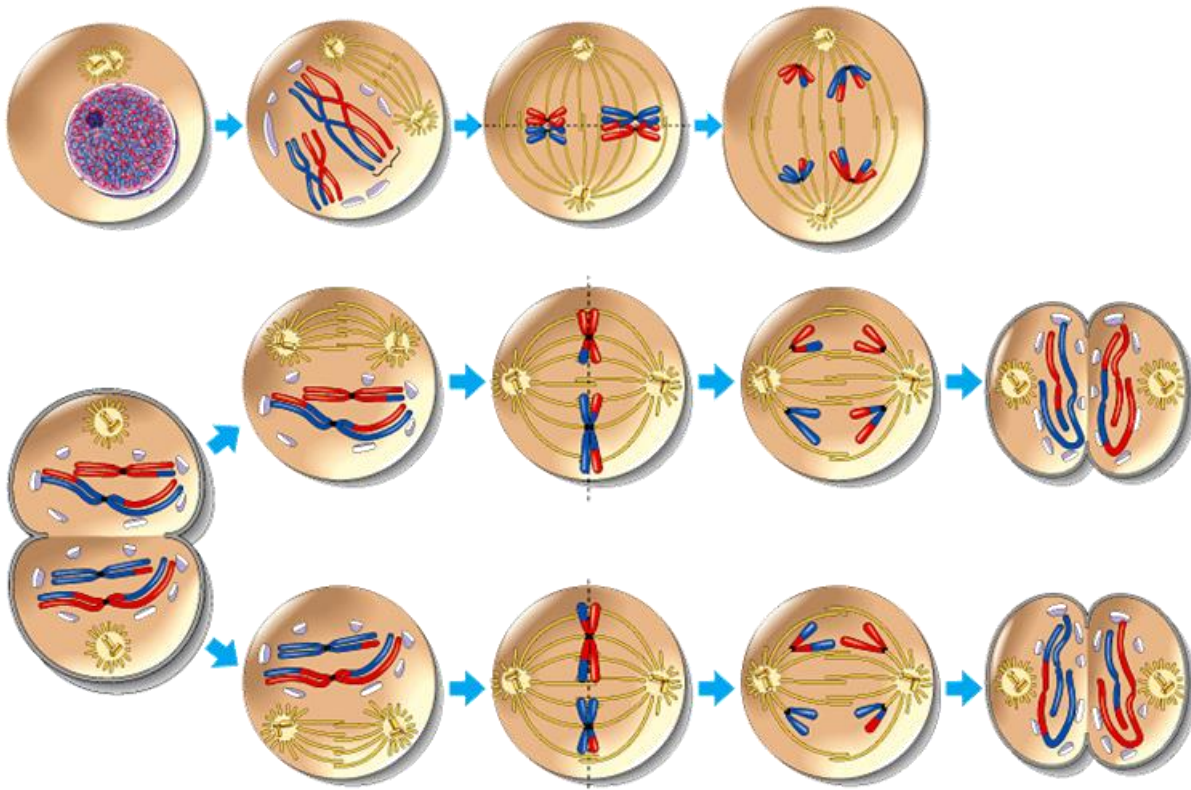
- Paired chromosomes
 - both chromosomes of a pair carry _____
 - control same inherited characters
 - homologous = same information

Meiosis reduces 46 chromosomes to 23 (in humans and mice)

Gamete production

- Alternating stages
 - chromosome number must be reduced
 - _____ → _____
 - ____ → _
 - humans: 46 → 23
 - meiosis reduces chromosome number
 - makes _____
 - fertilization restores _____
 - _____ → _____
 - ____ → _





1st step of meiosis

- Duplication of DNA
- Why bother?
 - _____
 - convenient to use “machinery” of mitosis
 - DNA replicated in S phase of interphase of MEIOSIS (just like in mitosis)

Meiosis 1

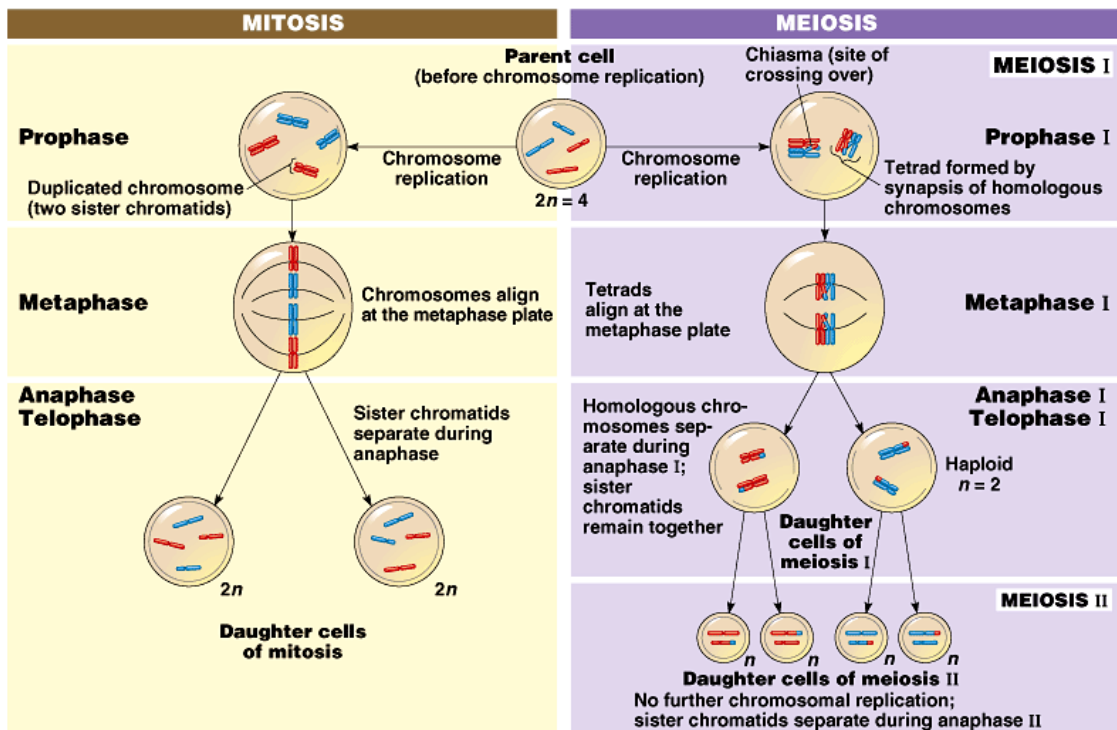
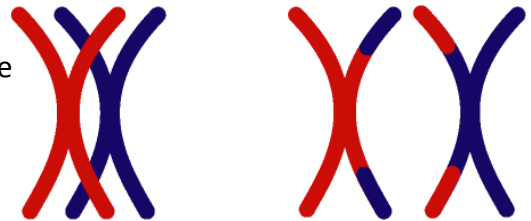
Tetrad

Synapsis

Meiosis 2

Crossing over

- during Prophase 1, _____ intertwine



PART 2. COMPARING MEIOSIS AND MITOSIS

Compare mitosis and meiosis for each of the following factors.

	Mitosis	Meiosis
Chromosome number of parent cell (ploidy state)		
Number of DNA replications		
Number of divisions		
Number of daughter cells produced		
Chromosome number of daughter cells		
Purpose/function		

Why sex?

Sexual reproduction introduces _____

- genetic _____
 - independent assortment of chromosomes
 - random alignment of _____ in Metaphase 1
- crossing over
 - mixing of alleles across homologous chromosomes
- random fertilization
 - which sperm fertilizes which egg?

Driving evolution

- providing variation for _____

Variation

Independent assortment of _____

- meiosis introduces _____
- gametes of offspring do not have same combination of genes as gametes from parents
 - random assortment in humans produces 2^{23} (8,388,608) different combinations in gametes

