Unit 4: Meiosis Notes

I. Introduction

A. An organism must inherit a _____ of every gene from both "_____"
   1. (Humans – 23 from mother and 23 from father, total of _____ or ___ chromosomes)

B. When an organism produces its own _____ (sex cells) the two sets of genes must be _____ from each other so that each gamete contains _____, or 1/2 the DNA.

C. Human gametes are _____ and _____ produced in the _____ (testes and ovaries)

II. Chromosome Numbers

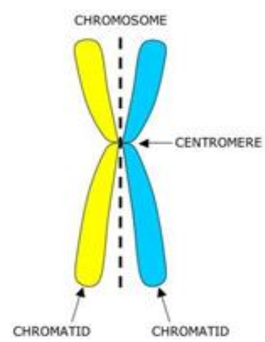
A. _____ Cells (body cells)
   1. Contain _____ of chromosomes (one set from mom, one set from dad) are called _____.
   2. _____ Cells
      a) Contain **both sets** of homologous chromosomes ("_____").
   3. The number of chromosomes is represented by 2N. Ex: Humans 2N = 2(23) = 46 chromosomes

B. Gametes (_____)
   1. Contain a _____ of chromosomes and are called _____ ("one set").
   2. The number of chromosomes is _____. Humans N=23.

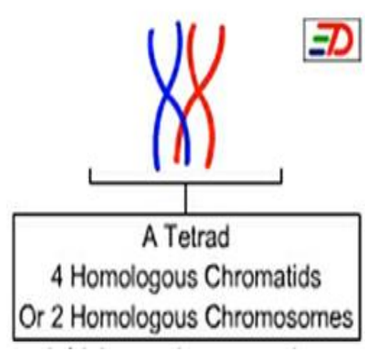
III. Meiosis

A. Haploid cells are produced from diploid cells through the process of _____.

B. Meiosis Definition
   1. A process of reduction division in which the _____ per cell is ____ _____ through the separation of homologous chromosomes to form 4 genetically _____ haploid cells.

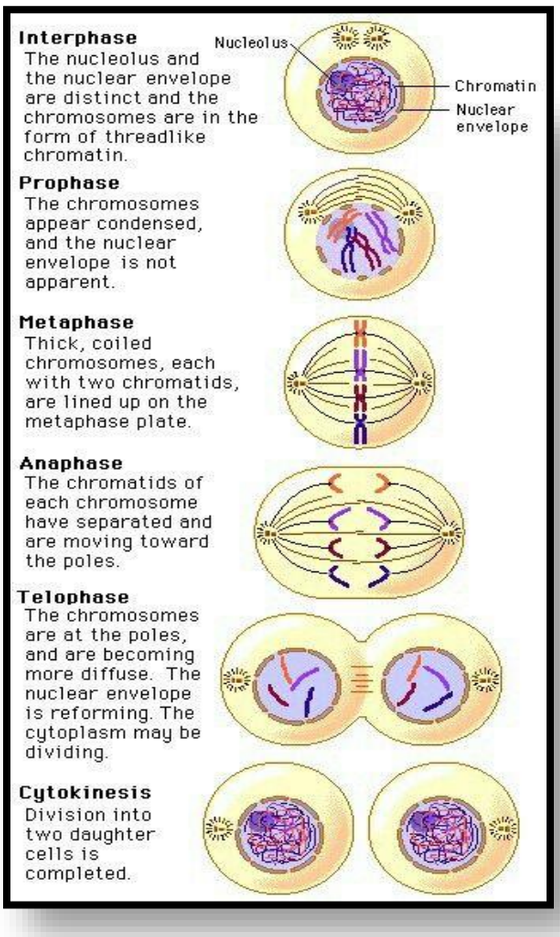
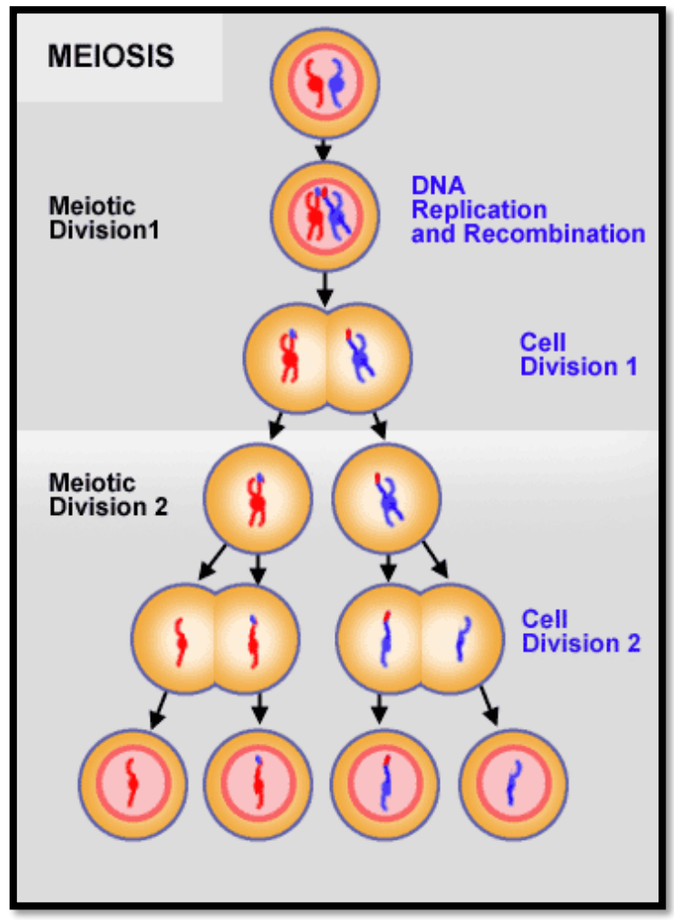
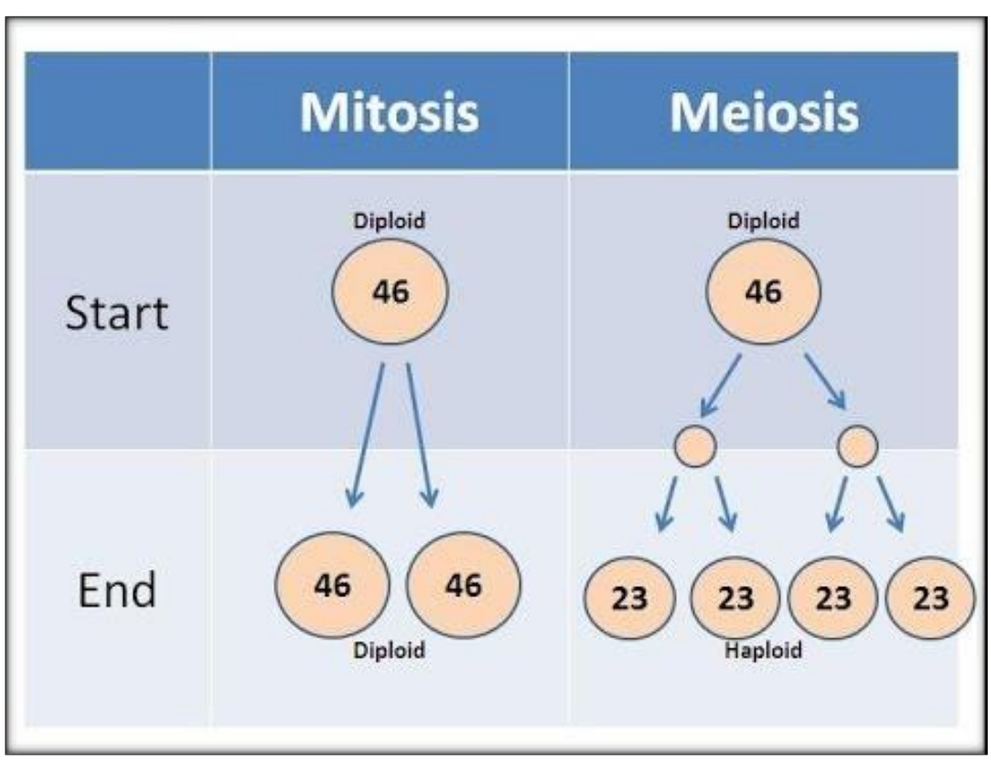


C. Phases of Meiosis I
   1. Meiosis I
      a) Chromosomes are replicated _____ meiosis 1 starts
      b) Each replicated chromosome _____ _____ of the cell and pairs with its corresponding homologous chromosome.
         ***One replicated chromosome, (2 chromatids) from mom and one replicated chromosome (2 chromatids) from dad. The _____form a _____.
      c) Crossing over in Prophase I (of Meiosis I)
         - As homologous chromosomes pair up and form tetrads, portions of the chromatids are _____.
         - Results in _____ _____. (Do you look EXACTLY like your brother(s) or sister(s)?)



      d) Homologous chromosomes separate, resulting in two new cells with _____ in each cell

   2. Meiosis II
      a) NO CHROMOSOME REPLICATION THIS TIME.
      b) Chromosomes _____.
      c) Paired _____ separate.
      d) Resulting 4 daughter cells now contain the _____ # (N), _____ the original chromosome number

IV. Comparing Mitosis (Cell Cycle) and Meiosis

Mitosis (Cell Cycle)	Meiosis
Results in two genetically identical cells	Results in four genetically different cells
1 diploid cell → 2 diploid cells	1 diploid cell → 4 haploid cells
Asexual reproduction for growth, or replacement of cells (produce somatic cells)	Sexual reproduction (produce gametes)