Sec:____Name:_____

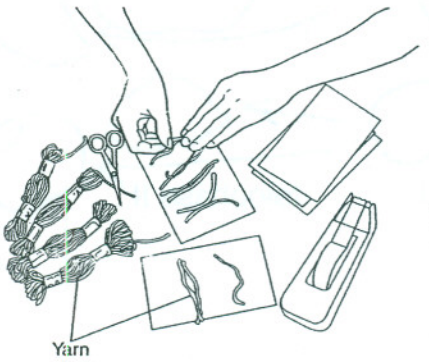
Experiment: Chromosome Changes During Meiosis (B. Science 10-11-4d)

Purpose: To diagram chromosome changes in meiosis, and to understand crossing - over.

Materials: quarter sheets of paper yarn (dark and light red & blue) colored pencils tape scissors

Methods: **Part A: Crossing - Over**

1. During prophase I of Meiosis the homologous pairs of chromosomes line up beside each other. Each chromosome in the pair is made up of two sister chromatids. This gives a total of four chromatids together. What is the name of these four chromatids?


Yarn

2. Obtain 20 cm lengths of the four colors. Then cut each of the pieces into two. Place the two - 10 cm lengths of dark red yarn next to each other. These represent the two sister chromatids of one chromosome in the homologous pair. Do the same for the two lighter red yarn. What what these two strand of lighter yarn represent?
3. We will call the two chromosomes of red Chromosome number one. Do the same for the blue yarn we will call this chromosome two. How many <u>more</u> chromosome pairs would we need if we were to represent the chromosomes in a human cell?
4. Now place the strands of the tetrad near each other and place a piece of tape over the middle of the strand to hold them together. What is the name of the structure in the chromosomes that hold the sister chromatids together?
5. In these artificial chromosomes it just happens to be that all the dominant are on one chromosome (represented by the darker color), and all the recessive traits are on the other chromosome of the pair (represented by lighter color). Move one dark strand and cross it over with one light strand. Cut where they cross over and use a small piece of tape to reattach the ends, (dark with the light and visa versa). When complete get teachers signature in results section of the lab.
6. Record what has happened with the dominant and recessive alleles as a result of crossing - over.

Part B: The Process of Meiosis

1. Meiosis is a process that occurs only in the reproductive cells. In the first cell, found in results, draw 2 pairs of chromosomes (use a different color for each) in the first stage of egg formation, the primary oocyte. Mark one chromosome of each pair A and one B.
2. Draw in the chromosomes and chromatids using the same markings described in step one as the cell undergoes each stage of meiosis.