

Scholars Biology**Meiosis Lab: Creating a Meiosis Flip Book****Part I: Reviewing Meiosis**

Recall that chromosomes are composed of DNA and contain the genetic blueprint for an organism. Each species has its own unique set of chromosomes, and all individuals in a particular species typically have the same number of chromosomes. Humans have 46 chromosomes. The domestic dog has 78 chromosomes, the domestic cat has 38 chromosomes, and the mouse that it chases has 40 chromosomes!

Within each individual in a species, every somatic cell contains the same number of chromosomes as every other. Humans (and most other animals) are diploid organisms meaning that each cell contains two complete chromosome sets.

Human gametes (sex cells) are haploid cells, meaning that they have only one complete set of chromosomes.

When fertilization occurs, the haploid sperm cell and haploid egg cell join, producing a fertilized zygote. This "restores" the diploid chromosome number.

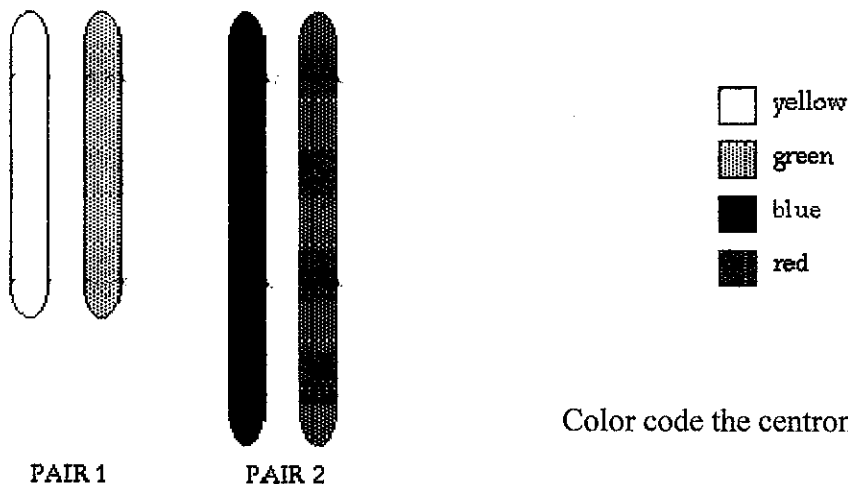
Part II: Modeling Meiosis

By creating a flipbook, you are going to work through the cellular events involved in meiosis step by step. You will be working with the chromosomes of a *Triffle*, a mythical organism, which has a diploid chromosome number of four.

Setting up the flipbook:**Procedure:**

Use the flipbook template pages as your area to draw each phase of meiosis.

1. Each page of the flipbook is labeled with the phase that you are going to draw.
2. The oval shape on the page is one sex cell in a *Triffle*.
3. Setting up the Genome:
 - You are going to create a diploid nucleus containing two pairs of chromosomes.
 - First, we will refer to the yellow/green pair as PAIR 1 and the blue/red pair as PAIR 2.
(be sure to color these chromosomes as they are labeled)
4. The chromosomes must fit within the cell boundaries on each page.
5. Using your notes and textbook, draw the events that occur in each phase of meiosis.
6. Be sure that you use the same size and placement of chromosomes so that as you flip through your completed book, it looks as if the chromosomes are properly placed and move in a logical progression through the steps of meiosis.
7. Color code the chromosomes as noted below. Make the centromeres black.



Color code the centromeres **black**.

Remember that a chromosome is tightly coiled strand of DNA. Within each chromosome there are many, many genes. The chromosomes within each pair are said to be homologous, meaning similar but not necessarily identical. Homologous chromosomes contain the same genes but not necessarily the same alleles, or different form of the same gene. For instance, two homologous chromosomes might contain the gene which codes for eye color, but the allele form might be different--like blue eye allele on one chromosome and brown eye allele on the other.

We are going to examine four Mendelian traits in the *Triffle*, specified by four genes. Remember that genes are segments of chromosomes which code for proteins that can result in the expression of detectable traits (phenotypes). Table II describes some imaginary traits of our mythical creature and their location on each chromosome.

Table II -- Imaginary Traits of the <i>Triffle</i>		
Genes on PAIR 1		
	Fur Color	Fur Type
Green Chromosome	G (green fur)	c (straight fur)
Yellow Chromosome	g (yellow fur)	C (curly fur)
Genes on PAIR 2		
	Eye Color	Eyelash length
Blue Chromosome	B (blue eyes)	L (long eyelashes)
Red Chromosome	b (red eyes)	l (short eyelashes)

Your chromosomes should look like the ones below.

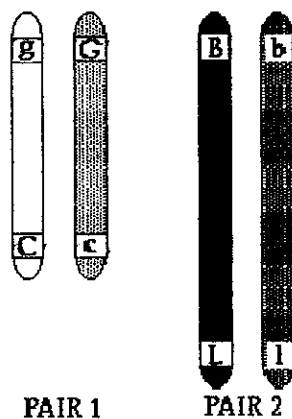


Figure 2. Map of *Triffle* Genes

Note that we are looking at only two genes (two pairs of alleles) on each chromosome, while ignoring hundreds of other genes.

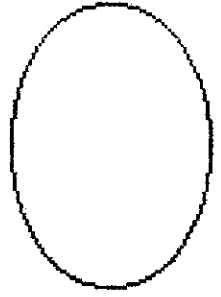
8. Label the location of each gene by adding the appropriate letter to each chromosome.
9. In each phase, make sure you show the genes on their respective chromosomes.
10. After you have completed all the drawings of each phase, cut out each pages and staple it to the right side of an individual note card.
11. Staple the cards in proper order on the left side the cards to form a booklet.
12. In your own words, describe what happens in each stage on the _____ side of the note card.

Show your teacher your masterpiece.

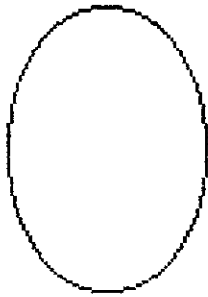
My Meiosis Flipbook

by _____

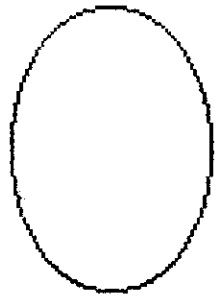
Metaphase I



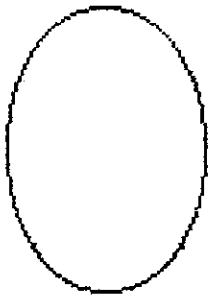
Prophase I - EARLY



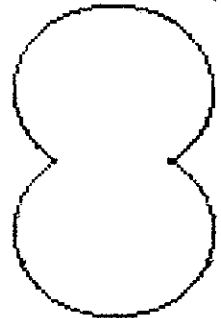
ANAPHASE I



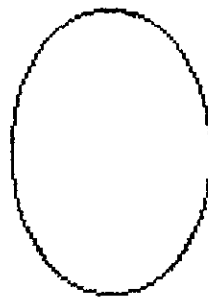
PROPHASE I - MID



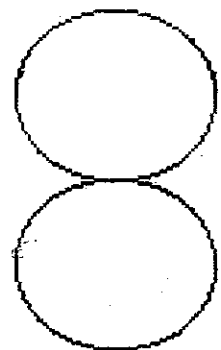
Telophase I - EARLY



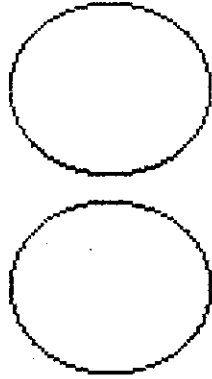
PROPHASE I - LATE



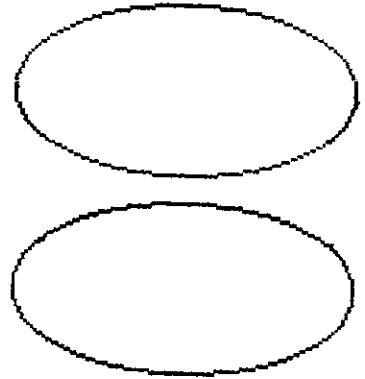
CYTOKINESIS



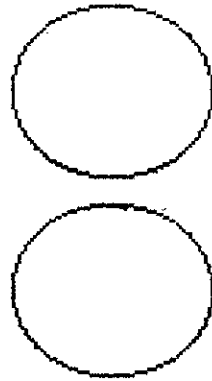
Prophase II - EARLY



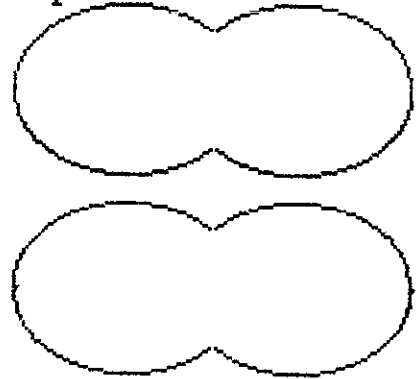
ANAPHASE II - LATE



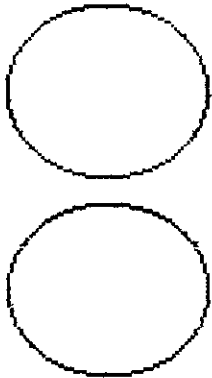
PROPHASE II - MID



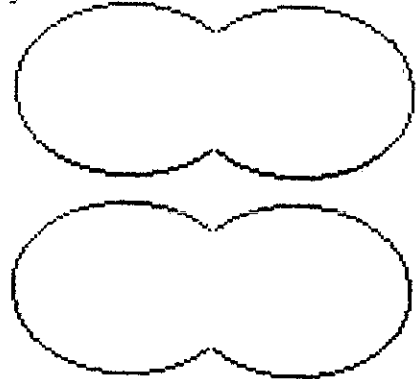
Telophase II -



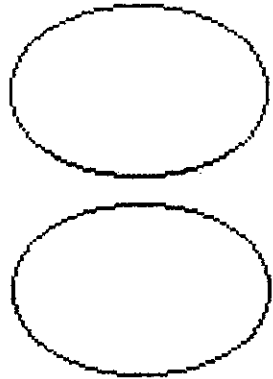
METAPHASE II



Cytokinesis



Anaphase II - EARLY



RESULT

