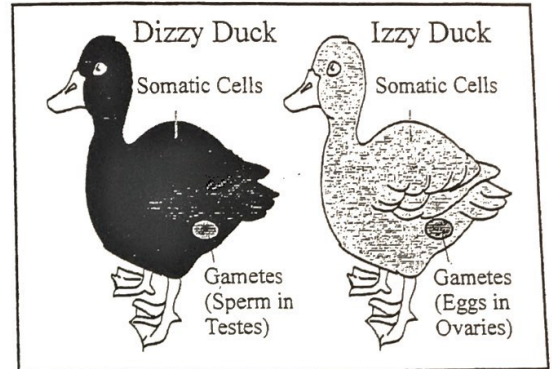


Why?

Have you ever wondered why you do not look exactly like your brother or sister, even though you came from the same parents? The answer lies in the way our genetic material separates into our **gamete cells**.

Model 1- Gametes v. Somatic (Normal) Body Cells

1. Consider the ducks in Model 1.
 - a. What is the gender of Dizzy Duck?
 - b. What is the gender of Izzy Duck?
 - c. What are the names of the two types of gametes?
 - d. Where are the two locations of gametes?

**Read This!**

The DNA in each cell in your body is over 3 meters long! The only way to package DNA such that it does not break or get tangled is to coil, or wrap it around proteins to form a **chromosome**. Because of the length of DNA, our cells have 23 pairs of chromosomes for a total of 46 chromosomes in each normal body cell.

You inherited 23 chromosomes from your mother and 23 from your father. For each chromosome from your mother, your father provides a corresponding, or matching chromosome. These corresponding chromosomes are considered **homologous**. In somatic, or normal body cells, there are 2 sets of chromosomes present, 1 set from your mother and 1 from your father. These cells are called **diploid**.

In sexual reproduction, one egg cell from your mother and one sperm cell from your father fuse, or join together, to create a cell called a **zygote**. The zygote will have a total of 46 chromosomes. The sperm contributes half of these chromosomes and the egg contributes the other half. It is for this reason that sperm and eggs are considered **haploid**.

2. Consider the information above to answer the questions. (*Answer in complete sentences*)

- a. Chromosomes are often compared to spools of thread. If you are not familiar with a spool of thread, examine the diagram to the right. In your own words, explain why many scientists compare chromosomes to spools of thread.


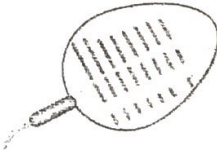
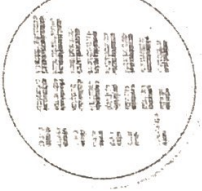


- b. How many chromosomes are found in a human sperm or egg cell?

- c. What is the difference between a haploid cell and a diploid cell?

Check for Understanding

3. Consider the information presented on the previous page. To show your understanding of these concepts, properly complete the table below.

			
Type of Cell (zygote, egg, or sperm)			
# of Chromosomes			
Classification of Cell (gamete or somatic)			
Diploid or Haploid			

Model 2- The formation of sperm and eggs cells occurs through a process called meiosis.

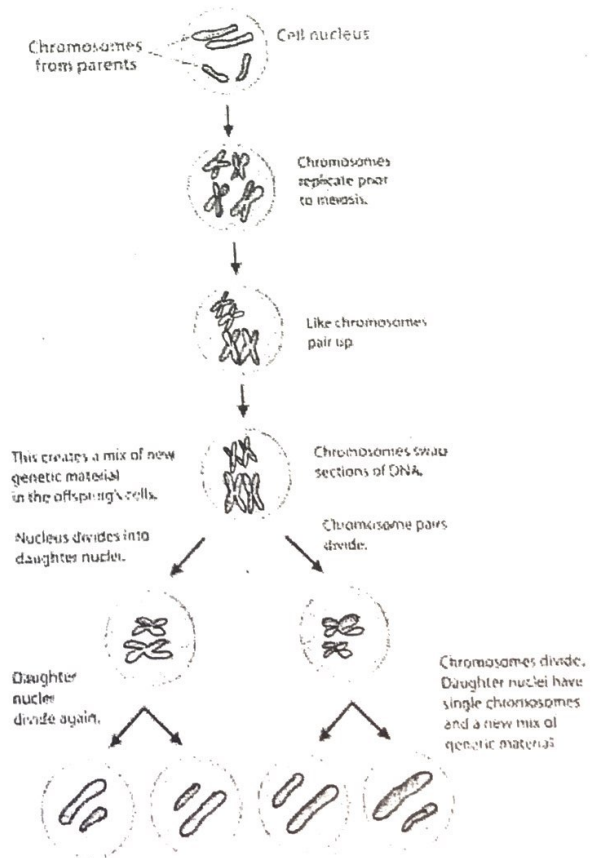
4. Consider Model 2. (Answer in complete sentences)

a. (IOD 303) What happens to chromosomes before meiosis occurs?

b. (IOD 303) What occurs in meiosis that allows for offspring to have a new mix of genetic material?

c. (EMI 401) How many cells are produced in meiosis?

d. (EMI 401) How does this diagram explain why you do not look exactly like your siblings?



Name _____

Directions : Read pages 323-324 in your book and fill in the blanks.

Prophase I

Chromosomes come in matching pairs, one set from mom and one set from dad, which are called _____ chromosomes. These chromosomes pair up and form a structure called _____. During this phase a process called _____ occurs. This is extremely important because it exchanges genetic information between a pair of _____ chromosomes and a new combinations of _____ are created in the cells which are a version of a gene.

Metaphase I

Chromosome centromeres attach to spindle fibers. Paired _____ chromosomes line up across the _____/equator of the cell.

Anaphase I

_____ fibers pull each homologous chromosome pair toward _____ ends of the cell.

Telophase I

The spindles break down. The _____ forms around each cluster of chromosomes. _____

occurs spontaneously after telophase I forming _____ new cells. The two cells produced by meiosis I have sets of _____ and _____ that are different from each other.

Prophase II

The chromosomes each consisting of two _____ now become _____.

Metaphase II

Chromosomes _____ up in the _____ of the cell.

Anaphase II

Paired _____ separate.

Telophase II

Nuclear _____ forms around each cluster of chromosomes. Meiosis results in _____ daughter cells that are _____, meaning each cell has just _____ chromosomes. The cells are not identical and result in genetic variation. Meiosis is done through sexual reproduction when egg and sperm form a zygote.

IDENTIFY THE PHASES OF MEIOSIS

Meiosis is a process in which the number of chromosomes per cell is cut in _____ through the separation of _____

cell.

