

Lesson 5.6

Meiosis

Name

Date

Period

Key Terms

crossing over
haploid

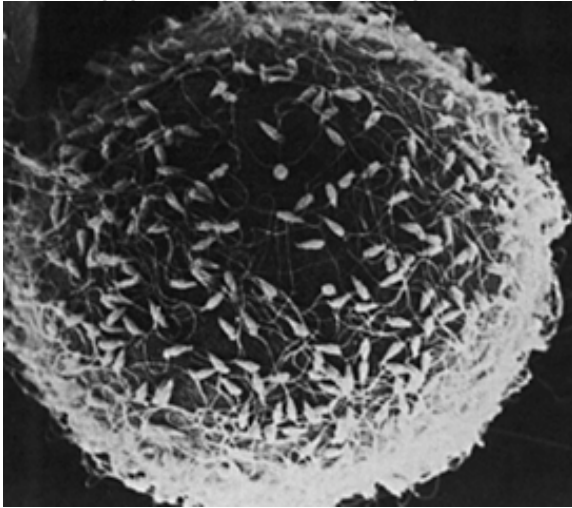
diploid
homologous chromosomes

fertilization
meiosis

gamete
zygote



Engage I: Answer the following questions.



1. What is in the photo to the left?
2. All human cells except for sperm and egg cells have 46 chromosomes. How many chromosomes do you think an egg has?
3. How many chromosomes do you think a sperm has?
4. When a sperm and egg unit or join the process is called fertilization. A zygote is formed. How many chromosomes do you think a zygote has?



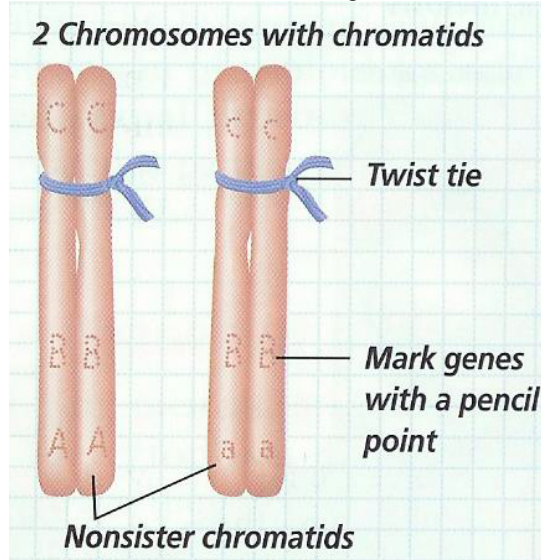
Explore I: Your instructor will now give you a power point lecture on meiosis. Sketch each picture for your flipbook, write the phase description on the corresponding back page, and then cut out and put your flipbook together as instructed by your teacher.

- 5) What is the purpose of meiosis?
- 6) Where does meiosis take place?
- 7) How is a haploid cell different from a diploid cell?



Explore II: Modeling Crossing Over

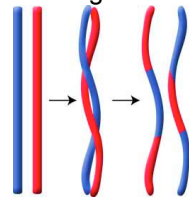
Instructions: 1. Roll out four long strands of clay at least 10 cm long to represent two chromosomes, each with two chromatids. Label genes A, B & C on one chromosome. Label genes a, b & c on the second chromosome.



2. Use the figure above as a guide in joining and labeling these model chromatids. Although there are four chromatids, assume that they started out as a single pair of homologous chromosomes prior to replication. The figure shows tetrad formation during prophase I of meiosis.

3. First, assume that no crossing over takes place. Model the appearance of the four gamete cells that will result at the end of meiosis. Record your model's appearance by drawing the gametes' chromatids and their genes in the data table.

4. Next, repeat steps 1-3, however, assume that crossing over occurs between genes B and C. For Example:



Draw gamete formation in the data table below...Be sure to label where the genes (A, B, C, a, b, and c) are.

NO CROSSING OVER	CROSSING OVER
Appearance of Gamete Cells	Appearance of Gamete Cells



Explain I

8. Define crossing over and explain when it occurs.

9. Compare any differences in the appearance of genes on chromosomes in gamete cells when crossing over occurs and when it does not occur.

10. What would be accomplished if crossing over occurred between sister chromatids? Explain your answer.

11. Crossing over has been compared to “shuffling a deck” in cards. Explain what this means.

12. Clearly explain two reasons why meiosis is so important.

13. During meiosis the resulting gametes have _____ the number of chromosomes as the parent cell.
 - a) double
 - b) triple
 - c) half
 - d) equal

14. Crossing over may occur during which phase of Meiosis I?
 - a) Prophase I
 - b) Metaphase I
 - c) Anaphase I
 - d) Telophase I

15. Homologous chromosomes move towards opposite poles of a dividing cell during...
 - a) mitosis
 - b) meiosis I
 - c) meiosis II
 - d) fertilization
 - e) binary fission

16.
 - a) How many cells do you start with at the beginning of meiosis?
 - b) How many cells do you have at the end of meiosis?

17.
 - a) Do you start meiosis with a haploid cell or a diploid cell?
 - b) Do you end meiosis with haploid cell or a diploid cell?

18. Explain in your own words how a gamete is different from a zygote.