# CHAPTER 11.4—11.6: Meiosis and Sexual Reproduction

1. Define the following terms:

      a. gametes _____

      b. somatic cells_____

      c. zygote _____
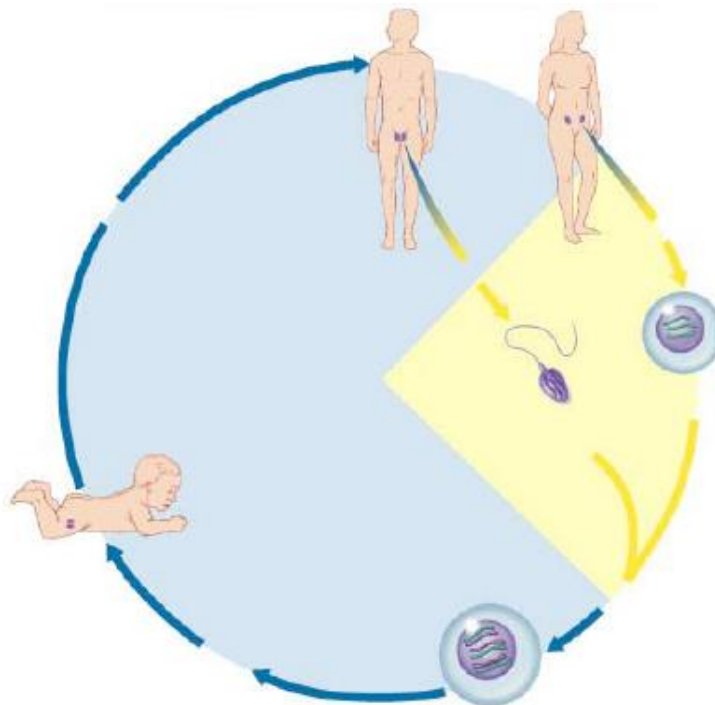
      d. fertilization _____
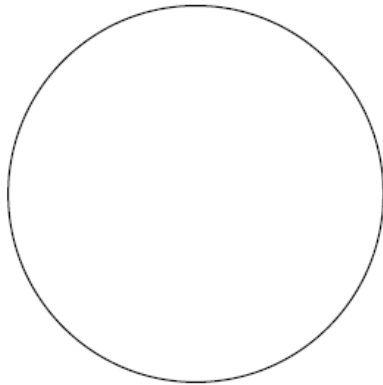
      e. diploid _____

      f. haploid _____

2. Why is meiosis called "reduction division"? Why is this process necessary for sexual reproduction?

_____

_____

_____

3. Label the diagram of the human lifecycle. Include the chromosome numbers at each stage.
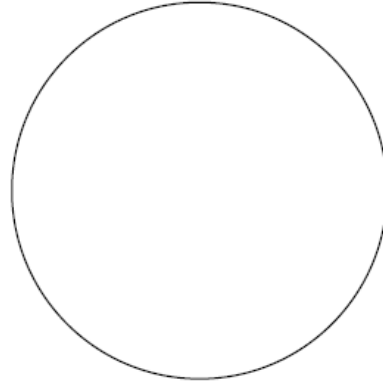
4. Explain synapsis.

_____

_____

_____

5. Use the diagrams below to distinguish mitosis from meiosis. For an organism where **2n=4**, draw a cell at **metaphase of mitosis** and a cell at **metaphase 1 of meiosis**.



Metaphase of mitosis                              Metaphase 1 of meiosis

6. Meiosis is said to be a double division. Explain.

_____

_____

7. Draw a pair of homologous chromosomes in **synapsis (Prophase I)** and then illustrate a crossing over event and the products of crossing over. Label the chiasmata.

8. At what stage of meiosis does crossing over occur? _____

9. Compare the final cellular products of mitosis with meiosis.

   a. Mitosis _____

   _____

   b. Meiosis _____

   _____

10. Summarize the significant differences between mitosis and meiosis.

| MITOSIS | MEIOSIS |
|---|---|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

11. Meiosis is an important source of variation. Define and describe how each of the following contributes to variation within a species:

a. independent assortment _____

_____

b. crossing over _____

_____

c. random fertilization _____

_____

12. What is the significance of genetic variation to natural selection and evolution?

_____

_____

13. What is the difference between necrosis and apoptosis?

_____

_____

_____

14. Read ahead in section 12.4 (pg. 247—250). How is recombination frequency used to determine relative distances between genes on the same chromosomes?

_____

_____

_____

15. List and describe a few specific examples of non-disjunctions that occur in humans.

    a. _____

    b. _____

    c. _____

    d. _____

16. How can a parent learn the risks of having a child with a genetic disorder?

_____

_____

_____

17. Explain procedures that can be used to detect genetic defects early in pregnancy.

    a. _____

       _____

    b. _____

       _____