Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ AP Biology Reading Guide

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Chapter 10: Meiosis and Sexual Life Cycles

***10.2 Fertilization and meiosis alternate in sexual life cycles***

1) What is the difference between sex chromosomes and autosomes? How many of each is found in human cells?

2) What is a karyotype and what is it used for?

3) Explain what is meant by homologous chromosomes (homologs).

4) The muscle cells of a dog have 78 chromosomes. Fill in the correct chromosome number in a:

Bone cell \_\_\_\_\_\_\_\_ sperm \_\_\_\_\_\_\_\_ haploid cell \_\_\_\_\_\_\_ somatic cell \_\_\_\_\_\_\_\_ zygote \_\_\_\_\_\_\_\_



5) In the diagram label the following:

1. sister chromatids
2. homologous chromosomes
3. centromere
4. replicated chromosome
5. maternal chromosomes

6) In the above cell:

How many chromosomes does it have? \_\_\_\_\_\_\_\_\_\_

How many homologous pairs? \_\_\_\_\_\_\_\_\_\_

How many chromatids? \_\_\_\_\_\_\_\_\_

Is this cell haploid or diploid? \_\_\_\_\_\_\_\_\_\_

7) Where are the gametes of humans produced and name the specific meiotic process they are produced by?

Males produced in: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ process name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Females produced in: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ process name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) What is the purpose of meiosis?

***10.3 Meiosis reduces the number of chromosome sets from diploid to haploid***

10) How many divisions does Meiosis go through? \_\_\_\_\_\_\_\_\_\_

***Lets study the events of meiosis I.*** 

11) Explain each of the following events that occurs during **Prophase 1**

**synapsis**

**crossing over (and the resulting recombinant DNA)**

**chiasmata**

12) In **Metaphase 1**. How is the arrangement of chromosomes different from metaphase of mitosis?



13) Now look at **Anaphase 1** and **Telophase 1.**



What separates and goes to the poles in Anaphase I? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the process after telophase called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many chromosomes are in each cell at the end of the first division? \_\_\_\_\_\_\_\_\_\_

\*Are the resulting daughter cells haploid or diploid? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\*

14) During Meiosis I the homologous chromosomes separate. What separates during meiosis II?

15) **Recap:**

 During which division is the chromosomes number reduced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many times do the chromosomes duplicate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many “daughter cells” are formed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the chromosome number? 2n or n? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16) In the figure below compare mitosis and meiosis. Add the following labels to the picture:

*Parent cell, Mitosis, Meiosis, Synapsis, Homologs, sister chromatids, daughter cells, Meiosis I, Meiosis II, Crossing over, disjunction, 2n, and n*

List the 3 events that occur during meiosis I that do not occur in mitosis.

17) Students often get confused about the differences between mitosis and meiosis. To help, work through the chart.



***10.4 Genetic variation produced in sexual life cycles contributes to evolution***

18) An important idea for you to understand is that new alleles arise by changes in the DNA or mutation, but genetic diversity occurs when the deck that is dealt is simply reshuffled. So, there are three ways that sexually reproducing organisms “shuffle the deck.” They are listed below. Explain what occurs in each, and how this increases diversity/evolution.

**independent assortment of chromosomes**

**crossing over**

**random fertilization**