

## Practice: Meiosis

Label the following as "S" for applying to somatic cells and "G" for applying to gametes.

1. S I am another word for body cells.
2. G Egg and sperm are me.
3. G Homologous chromosome pairs are inside of me.
4. G I have half the amount of chromosomes as other cells.
5. G My cells are haploid.
6. G In humans, I have 22 autosomes and 1 sex chromosome.
7. S I am identical to all other cells like me that form after cell division.
8. S I am formed throughout an organism's entire life, regardless of gender.

Label the following statements based on which state of Meiosis they apply to. Not all will be used. (You can just do PI, MI, AI, TI, PII, MII, AII, TII abbreviations if you would like!)

9. MII Sister chromatids line up in the middle of the cell.
10. PI Crossing over occurs.
11. TI Cytoplasm splits between two cells.
12. MI Homologous chromosomes are separated.
13. AII Sister chromatids are separated.
14. TII 4 individual nuclear membranes begin to form.
15. MI Pairs of chromosomes line up in the middle of the cell.

Answer the following questions.

16. What is the overall purpose of meiosis? To make reproductive cells.
17. What is the specific purpose of meiosis I? Split into 2 cells
18. What is the specific purpose of meiosis II? Split into 4 cells.
19. How often/when does this process happen in females? What about in males?  
Males all of their life, females once at the start of their life.
20. What could be a result of a mistake during this process? Infertility, or deformations in a baby.

## Practice: Haploid v. Diploid

Answer the following questions about the karyotype below.



A collection of chromosome types.

1. What is a karyotype? \_\_\_\_\_  
\_\_\_\_\_
2. How many autosomes are in this human karyotype? How many sex chromosomes? 22 auto, 1 sex
3. If the last pair reflects whether the organism is male or female, which would this organism be? Explain how you know.  
Male, as there is a Y chromosome.  
\_\_\_\_\_
4. Based on the picture, is this a karyotype of a diploid or haploid cell? Explain how you know.  
Diploid, since there are pairs.  
\_\_\_\_\_
5. Based on your answer to #4, what type of cells would have this amount of chromosomes in them?  
Sex cells.  
\_\_\_\_\_
6. Is this a picture of chromosomes before or after DNA Replication during the S phase of interphase? Explain how you know.  
Before, since there are 23 chromosomes.  
\_\_\_\_\_
7. What would a karyotype like this look like after meiosis? A sperm or egg cell.  
\_\_\_\_\_

8. How did this organism get these chromosomes? Where did they come from? \_\_\_\_\_

They come from their parents, and their parents before them.

9. Why are karyotypes useful diagrams? What can they show you about an organism? \_\_\_\_\_

They can show what the structure of the karyotypes are, and any abnormalities.

10. Organisms have different numbers of chromosomes. Fill in the chart below about 5 different organisms.

Species	# of chromosomes in diploid cells (2n)	# of homologous chromosome pairs in diploid cells	# of chromosomes in haploid cells (n)
Humans	46	23 pairs	23
Bat	44	22 pairs	22
Monkey	42	21 pairs	21
Camel	70		35
Dog	78	39 pairs	39

11. The number of chromosomes during meiosis is incredibly important. Why is that? \_\_\_\_\_

Because if you lack enough the process can cause very uneven distribution of them, and cause a very bad result.

12. Below you will sketch the difference between cells that go through mitosis versus meiosis. The focus is on the number of chromosomes, not the specific steps, so you only need to draw the chromosomes in each circle. Do this drawing for a fruit cell, whose body cells have 8 chromosomes, or 4 homologous pairs.

