Mitosis and Meiosis Webquest Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Biology Date: \_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_

Objective: In this activity, you will use the following web pages to examine the processes of mitosis and meiosis. Both of these processes are important in homeostasis as well as human reproduction.

**PART A: Cell Growth and Mitosis**

Please go to the following webpage: <http://plaza.ufl.edu/alallen/pgl/modules/rio/stingarees/module/index.html>

1. What is the function of the cell membrane related cell division? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the role of the nucleus in cell division? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the role of the centrioles in cell division? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What is the role of the microtubules in cell division? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Click on the tab, “Why Must Cells Divide?”*

1. Why are cells limited in size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. *Click on the animation*. A cell with 2cm sides has what surface area? \_\_\_\_\_\_What volume? \_\_\_\_\_\_\_\_\_
3. What would be the surface to volume ratio? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. A cell with a large volume will have a more difficult time doing what? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Click on the tab, “What Does Mitosis Do?”*

1. What are the 2 major functions of mitosis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Click on the tab, “Built-in Controls in Mitosis”*

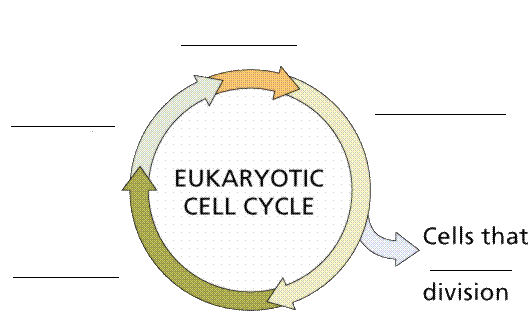
1. What are the 2 ways that cells “know” to stop dividing? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please go to the following webpage: <http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookmito.html>

1. What ends the cell division process where one cell splits from the sister cell? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Some cells divide rapidly. Example? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Some cells do not divide at all after maturity. Example? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the result of binary fission (genetically the same or different)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the genetic relationship between resulting cells in mitosis (genetically the same or different)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Label the following steps of mitosis:



**PART B: Meiosis**

Please go to the following webpage: <http://www.lewport.wnyric.org/jwanamaker/animations/meiosis.html> or

<http://www.cellsalive.com/meiosis.htm>

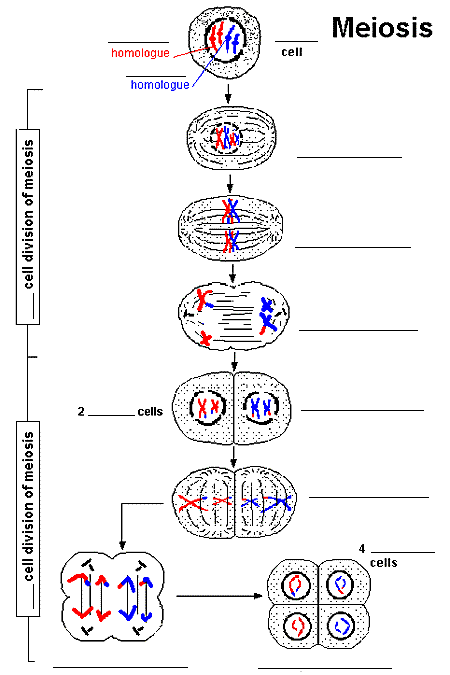
1. Why is the meiosis important? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. *Start the animation*. What do the chromosomes do in Prophase 1? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Compare how chromosomes line up on the equator (for separation) in Metaphase 1 and 2?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. In which phase are the number of chromosomes divided in half as a reduction division(Meiosis 1 or 2)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Label the following steps of Meiosis: <http://www.accessexcellence.org/RC/VL/GG/meiosis.html>



**PART C: Comparing and Contrasting Mitosis and Meiosis**

<http://www.biology.arizona.edu/CELL_BIO/tutorials/meiosis/problems.html>

<http://www.cellsalive.com/meiosis.htm>

<http://www.stolaf.edu/people/giannini/flashanimat/celldivision/meiosis.swf>

<http://www.pbs.org/wgbh/nova/baby/divide.html#>

After visiting the following web pages, compare and contrast mitosis and meiosis.

**Then, fill in the following Venn Diagram of the terms listed below.**

**Terms**:

Asexual reproduction Haploid

Sexual reproduction Diploid

Same Chromosome number Sex cells

Different Chromosome number somatic cells

One part to cell division cell division

Two parts to cell division (I and II) growth

Example: Bacteria reproduction repair

Example: Human reproduction

chromosomes

**PART C: Comparing and Contrasting Mitosis and Meiosis**

**Mitosis Meiosis Does not belong:**