**Bio Mitosis & Meiosis**

1. **Complete the assigned readings OR view one of the animations OR podcast:**

* Read and take notes on pages 243-252 and 269-276 in textbook

(e-book link: <http://www.glencoe.com/ose/showbook.php?access_code=B6B8740BE2>)

or

* View/ interact with one of the animations:

<http://sepuplhs.org/high/sgi/teachers/genetics_act3_sim.html>

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

or

* View and take notes from the podcast: <http://www.bozemanscience.com/cell-division>

1. **Complete both webquests.**

Please visit my website for links on the “Cellular Reproduction Tab”

You may type or write your answers.

1. **Compare Mitosis and Meiosis using the Venn-Diagram (last page).**
2. **Summarize the animation by illustrating (and labeling) the processes of mitosis and meiosis.**

Please visit my website for the links if needed or email Ms. Verissimo ([sverissimo@wlps.org](mailto:sverissimo@wlps.org)) with any questions.

**Due Date: Monday, February 23, 2014**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Mitosis - Webquest

In this internet lesson, you will review the steps of mitosis and view video simulations of cell division. You will also view an onion root tip and calculate the percentage of cells at each of the stages of cell division.

### Mitosis Tutorial

Go to <http://www.cellsalive.com/> On the left side of the screen is a navigation bar, click on the link to MITOSIS. Read and view the animation, you can slow down the video by clicking step by step through the phases.

1. Label during which stage of mitosis the following events occur:

|  |  |
| --- | --- |
| Chromatin condenses into chromosomes | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Chromosomes align in center of cell. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Longest part of the cell cycle. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Nuclear envelope breaks down. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Cell is cleaved into two new daughter cells. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Daughter chromosomes arrive at the poles. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Chromatids are pulled apart | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

2. Watch the video carefully. The colored chromosomes represent chromatids. There are two of each color because one is an exact duplicate of the other. How many chromosomes are visible at the beginning of mitosis in this animation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
-- How many chromosomes are in each daughter cell at the end of mitosis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
--The little green T shaped things on the cell are: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
-- What happens to the centrioles during mitosis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Identify the stages of these cells:

|  |  |  |
| --- | --- | --- |
| http://www.biologycorner.com/resources/mitosis_metaphase.gif | mitosis telophase | http://www.biologycorner.com/resources/mitosis/mitosis_prophase.gif |
|  |  |  |

### Mitosis Animation

Go to <http://www.johnkyrk.com/mitosis.html> . Draw a cell in each of the following phases.

|  |  |  |  |
| --- | --- | --- | --- |
| Prophase | Metaphase | Anaphase | Telophase |

### Onion Root Tip

Online Activity at <http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html>

Read the introduction, then click the “next” button.  
  
You will have 36 cells to classify. When you’re finished, print your results.

### Mitosis in Whitefish & Onion Roots

<http://www.biologycorner.com/projects/mitosis.html>. Click on the Whitefish embryo and the onion root tip.

For each organism, identify the stage of mitosis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | View 1 | View 2 | View 3 | View 4 | View 5 |
| Whitefish |  |  |  |  |  |
| Onion |  |  |  |  |  |

# Meiosis - Webquest

In this investigation, you will view sites that illustrate the process of meiosis.

**Site 1 - Lew-Port's Meiosis Page**  
Go to Lew-Port's Biology Place: <https://lpscience.fatcow.com/jwanamaker/animations/meiosis.html>

1. How many chromosomes does the cell in this animation start with? \_\_\_\_\_\_\_\_\_\_\_\_\_
2. The homologous pairs are represented by similar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. When chromosomes make copies of themselves, they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Copies of chromosomes are held together by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Each chromosome finds its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Draw "crossing over" - using your pencil to color in the areas that exchange parts.
7. How many chromosomes are at each pole of the cell? \_\_\_\_\_\_\_\_\_\_\_
8. During meiosis 2, chromosomes line up again along the cell's \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Only \_\_\_\_\_\_\_\_\_ copy of each chromosome moves toward the poles. Which means only \_\_\_\_\_\_\_\_\_ chromosomes of the original six.
10. New membranes form around each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. Each cell divides, forming a total of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells.

**Site 2 - Animation of Meiosis**

View the meiosis animation at http://www.sumanasinc.com/webcontent/animations/content/meiosis.html

1. Read the introduction. Explain how sexual reproduction results in unique offspring.

**Click the "STEP THROUGH" button and answer the questions:**

1. DNA replication takes place when? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Meiosis consists of two cell divisions: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Centrosomes (aka centrioles) migrate to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. The pairing of homologous chromosomes is called: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Crossing over points are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What happens in metaphase I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. What happens during anaphase I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. In prophase II, each cells is [ diploid / haploid ] (circle)
9. In metaphase II, chromosomes line up in [ single | double ] file.
10. What happens during telophase II? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. Each of the four daughter cells produced by meiosis is [ identical / unique ]

**Click to the Quiz:**

1. With respect to meiosis, when does DNA replication occur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. When does crossing over occur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. During which phase do chromosomes line up along the equator? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which phase does the nuclear membrane form around chromosomes? \_\_\_\_\_\_\_\_\_\_

**Site 3 - Biology in Motion - Meiosis**  
Go to [www.biologyinmotion.com](http://www.biologyinmotion.com) 🡪 click "Cell Division Exercise" 🡪 Click "Practice Meiosis"

1. There are two ways in which the chromosomes can end up after meiosis. Sketch the two ways and indicate by color the chromosomes:

**Site 4: PBS: Mitosis vs. Meiosis**  
Go to: <http://www.pbs.org/wgbh/nova/baby/>🡪 Click "How Cells Divide" 🡪 "Mitosis vs. Meiosis"

1. After viewing the animation, fill out the chart below, by placing a check in the box or boxes to indicate which the event occurs in (some events might have checks for both mitosis and meiosis).

|  |  |  |
| --- | --- | --- |
|  | **Meiosis** | **Mitosis** |
| Two cell divisions |  |  |
| Centrioles appear |  |  |
| Chromosomes pair up |  |  |
| Spindle fibers form |  |  |
| Crossing over occurs |  |  |
| Cytokinesis occurs |  |  |
| Two daughter cells |  |  |
| Four daughter cells |  |  |
| Daughter cells are identical to parent cells |  |  |

