Name Period

**Mitosis Internet Activity**

**Background:**

The cell cycle describes the ‘life cycle’ of a cell. There are three main divisions of the cell cycle: **Interphase**, **Mitosis**, and **Cytokinesis**. Interphase (itself actually three separate parts, **G1**, **S**, and **G2**) is the ‘growth’ part of the cell cycle; cells physically grow, acquire materials necessary for division, and DNA replication occurs during the ‘S stage’ of interphase. Mitosis describes the division of nucleus (producing two ‘daughter’ nuclei each identical to the parent nucleus). There are four parts of Mitosis: **prophase**, **metaphase**, **anaphase**, and **telophase**. Finally, Cytokinesis is division of the cell itself (the cytoplasm and all organelles other than the nucleus) and often occurs simultaneously with telophase. The result of the cell cycle is two daughter cells, each genetically identical to the parent cell.

**Objectives:**

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

Eukaryotic Cell Division:

**Site 1**

There are several reasons for the cell to divide. Two reasons are shown at the following website:  
<http://plaza.ufl.edu/alallen/pgl/modules/rio/stingarees/module/what.html>

* Click on “What Does Mitosis Do?”

1. Name the two reasons shown for cell division.



1. How does a bone repair itself if it is broken?
2. Give two examples of cells that do not undergo mitosis?



There are several parts of the cell involved in cell division. Click on the parts shown at the following site and read what they do.

* Click on “Basic Cell Parts Involved In Mitosis.”

1. List the four organelles involved in cell division and explain their function is cell division.

* Click on “Why Must a Cell Divide?”

5. Why must a cell divide, not just continue to become larger?

**Site 3**

When the cell needs to divide, the DNA must coil up tightly into chromosomes. When DNA has not copied itself, the chromosomes will only have one strand. These strands are called chromatids. After DNA replicates, each strand (chromatid) has a twin that is attached to it. These pairs of twin chromatids are called sister chromatids. Sister chromatids are connected by a centromere. See what chromatids and sister chromatids look like on the following site:  
<https://www.tes.com/lessons/sIWJmjprvRjEoQ/cell-cycle-m-phase>

* Click on #10 “Chromosome Replication” to view the image

Draw and label a picture of the sister chromatids and the centromere.

Mitosis Internet Lesson

**Site 1**

<http://www.cellsalive.com>

* On the top row find “Interactive Eukaryotic Cell Cycle”, click on the link to “Mitosis”
* Read the text on this page.

1. List the stages of mitosis.

* prometaphase – do not worry about

2. At which stage does each of the following occur?

* Chromatin condenses into chromosomes.
* Chromosomes align in center of cell.
* Cell is cleaved into two new daughter cells.
* Daughter chromosomes arrive at the poles.
* Click on the red ”Start the Animation” button and watch the video/animation carefully**.** You can slow down the video by clicking step by step through the phases.

3. The colored chromosomes represent chromatids. There are two of each color because one is an exact duplicate of the other.

* How many chromosomes (in pairs) are towards the beginning (prophase) of mitosis?

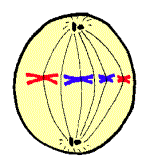
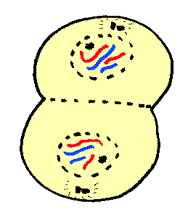
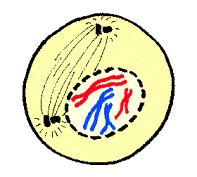
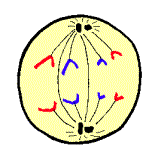
Hint: How many different colors are present?

* How many are in each daughter cell towards the end of mitosis (teleophase)?

The little green T shaped things on the cell are centrioles.

* What happens to the centrioles during mitosis?

4. Identify the stages of these cells and write them on the lines below the pictures.



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**DNA Basics - Online Activity: Enter the following web address in your browser.**

**Site 2**

<http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/main.html>

* Click on “DNA Basics” and answer the following questions:

Describe DNA

Where is DNA stored in a cell?

What is chromatin?

* Click Next or “The Cell Cycle” on the tutorial page and answer the following questions:

Define and describe the cell cycle.

What happens during mitosis?

* Click Next or “Mitosis” on the tutorial page and answer the following questions:

What is the ultimate product of mitosis?

**Onion Root Tip - Online Activity: Enter the following web address in your browser**

**Site 3**

<http://www.biology.arizona.edu/cell_bio/cell_bio.html>

* Click on the Activity : [Online Onion Root Tips: Phases of the cell cycle](http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html)
* Read the introduction, then click the “next” button.
* This page is a summary of the five phases of mitosis. Read it and click “next

|  |
| --- |
| In this activity, you will be presented with cells from the tip of an onion root. You will classify each cell based on what phase it is in. At the end you will count up the cells found in each phase and use those numbers to predict how much time a dividing cell spends in each phase. You can base your calculation on a total cell cycle of 24 hours.  You can enter data in this table as you go along, or at the end of the activity. |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | Interphase | Prophase | Metaphase | Anaphase | Telophase | Total | | number of cells | 2by2 | 2by2 | 2by2 | 2by2 | 2by2 | 36 | | percent of cells | 2by2 | 2by2 | 2by2 | 2by2 | 2by2 | 100% | |

**Mitosis in Whitefish and Onion Roots:**

**Site 4**

<http://www.biologycorner.com/projects/mitosis.html>

For each organism, identify the stage of mitosis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | View 1 | View 2 | View 3 | View 4 | View 5 |
| Whitefish |  |  |  |  | Not available |
| Onion |  |  |  |  |  |

**For Fun:**

<http://www.quia.com/servlets/quia.activities.common.ActivityPlayer?AP_rand=1538401416&AP_activityType=12&AP_urlId=3371&AP_continuePlay=true&id=3371>



1. Read the instructions on the web site and complete the activity asked.

2. When you have successfully completed the activity, you will see “You Win” and you can see the hidden picture. PRINT this page out and attach it to your packet.

<http://www.quia.com/rr/89527.html>

1. Press “Start” on Rags to Riches game!!

2. Answer the questions to gain $$!!

3. You must at least make $250,000. Once you pass this point you must PRINT out this page and attach it to the packet for credit.

4. Be careful because if you answer incorrectly, you will have to start over!

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