Name: _____ Date: _____ Period: _____ BIN: _____

Mitosis Web Quest

When providing the best possible answer to the following questions please apply all learned scientific techniques and procedures, do not use abbreviations, use proper scientific terminology, show work for all mathematical calculations, use all significant figure and scientific notation rules, apply appropriate writing strategies, and note that at all times spelling counts. Your ability to meet these and all established classroom expectations, including labeling of BINs, providing heading information, and your ability to follow directions may be included in computation of grade.

Introduction:

Why can't organisms just be one giant cell? Diffusion cannot occur quickly and efficiently if the distances involved become too large. Wastes would collect inside the cell and poison it. Nutrients could not reach organelles in time, so cells would die. Information overload would occur. DNA does not make copies as a cell grows – what it starts with is all that it has. There must be enough DNA blueprint to allow for protein production. For these reasons, the cells of living organisms must regularly divide. This process is called CELL DIVISION.

Follow the directions verbatim and in order to complete this assignment.

1. The Web Quest – Overview parts 1 and 2. Procedures #1 – 6.
2. The Cell Cycle Book – Procedure #7

The web sites are linked below so that you don't have to type in long URLs. The goal of this activity is to enhance your knowledge of the cell cycle – including an in-depth understanding of the following:

1. Limits to Cell Size & Reasons for Cell Division
2. Stages of the Cell Cycle
3. Appearance of Chromosomes During the Cell Cycle
4. Uncontrolled Cell Cycle (Cancer)

Overview/Introduction Procedure

1. The first step is to preview an animation that introduces you to the cell cycle. This animation can be accessed via the following web link: http://highered.mcgraw-hill.com/sites/0072495855/student_view0/chapter2/animation__how_the_cell_cycle_works.html

2. The second step is to preview an animation that introduces you to mitosis (nuclear division). This animation can be accessed via the following web link: http://highered.mcgraw-hill.com/sites/0072495855/student_view0/chapter2/animation__mitosis_and_cytokinesis.html

Procedure #1

Log on to the following web page:
http://www.quia.com/servlets/quia.activities.common.ActivityPlayer?AP_rand=1538401416&AP_activityType=12&AP_urlId=3371&AP_conti

1. Read the instructions on the web page and complete the activity.
2. When you have *successfully completed* the activity, you will see "YOU WIN" and you can see the hidden picture. PRINT this page out to turn in with your assignment. It DOES NOT have to be in color. If you do not have access to a printer, save it to a word document and email it to yourself. When you return to school you can access your email on a library computer and print it out using a school printer. If you choose this option you MUST TYPE your name on the word document. Handwritten names will receive no credit.

Procedure #2

Log on to the following web page: http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html

1. Read the introduction, then click "next" at the bottom of the page.
2. You will have 36 cells to classify. Follow the given directions on the web page.
3. When you are finished, record your information in the data chart below:

	Interphase	Prophase	Metaphase	Anaphase	Telophase	Total
Number of Cells						
Percent of Cells Seen						

HINT: To calculate % - take the number of cells seen in each phase and divide by total number of cells. Then multiply by 100.

Procedure #3

Log on to the following web page: http://www.cellsalive.com/

1. On the left side of the screen is a navigator bar. Click on the "Mitosis" link.
2. Read the text on this page and view the animation. You can make the video slow down by clicking step by step through the phases. Watch the video CAREFULLY - Answer the following questions:
    a. List and briefly describe the stages of mitosis:

    b. In which stage does the following occur?
        i. chromatin condenses into chromosomes:_____
        ii. chromosomes align in center of cell:_____
        iii. longest part of the cell cycle: _____
        iv. nuclear envelope breaks down: _____
        v. cell is cleaved into two daughter cells: _____
        vi. daughter chromosomes arrive at polls: _____
    c. The colored chromosomes represent chromatids. Why are there two of each color?

    _____

    d. How many chromosomes are visible at the beginning of mitosis? _____
    e. How many are in each cell at the end of mitosis? _____
    f. The little green T shaped items on the cell are centrioles. What happens to the centrioles during mitosis? _____

Procedure #4

Log on to the following web page: http://www.quia.com/rr/89527.html

1. Press "Start" on the rags to riches game.
2. Answer the questions to earn $$.
3. You must make *at least* $250,000.00. Once you pass this point, PRINT out this page to turn in with your assignment. If you do not have access to a printer, save it to a word document and email it to yourself. When you return to school you can access your email on a library computer and print it out using a school printer. If you choose this option you MUST TYPE your name on the word document. Handwritten names will receive no credit.
3. Be CAREFUL…if you answer incorrectly, you will have to start over!

Procedure #5

Log on to the following web page: http://plaza.ufl.edu/alallen/pgl/modules/rio/stingarees/module/what.html

1. Name the reasons shown for cell division:

2. There are several parts of the cell involved in cell division. Click on the parts shown at the following web page and read what they do: http://plaza.ufl.edu/alallen/pgl/modules/rio/stingarees/module/index.html
    a. What do the centrioles do for the cell?

3. The following site explains the function of the spindle fibers: http://www.nature.com/scitable/definition/spindle-fibers-304
    a. Define and draw a spindle fiber.

Procedure #6

Now it's time for a quick review. Watch the following animation: http://www.sumanasinc.com/webcontent/animations/content/mitosis.html

1. Read the Introduction.
2. Click "Narrated".
3. Click on the "Show Text" icon at the bottom corner of the animation – it is located between the house and the Q.
4. Click the arrow to play the animation.
5. Read the Conclusion.
6. You may go back to the beginning and choose the "Step Through" version to enhance your understanding…this version allows you to control the speed of the animation.

Procedure #7

Now that you have reviewed all of the web animations, you are ready to create your book on the Cell Cycle and Mitosis. Complete the following steps in order…you will turn in your book with this assignment.

1. Obtain 2 blank sheets of paper & colored pencils. You will also need your textbook.
2. With the paper stacked on top of each other, fold the paper from left to right down the middle of the page (like a hamburger).
3. **PAGE 1**: Create a book cover that includes a title for your book and the name of the author of the book

EACH OF THE FOLLOWING PAGES SHOULD HAVE A HEADER/TITLE AND PAGE NUMBER. YOUR PAGES SHOULD BE COLORFUL AND CREATIVE AND ANY DEFINITIONS or EXPLANATIONS SHOULD BE EASILY UNDERSTOOD – I.E. DO NOT COPY STRAIGHT FROM THE BOOK – REWORD FOR UNDERSTANDING!

4. **PAGE 2**: Draw and describe a chromosome – use pg. 212 in your textbook for help - be sure to include a description of what chromosomes are made of!
5. **PAGE 3**: Using page 212 in your textbook, draw and label a circular chart that shows the events of the cell cycle.
6. **PAGE 4**: Describe the 3 stages of Interphase AND what occurs in each phase.
7. **PAGE 5**: Define Mitosis - list the 4 phases of Mitosis.
8. **PAGE 6**: Using page 213 in your textbook, draw AND describe the phases of Mitosis (including Cytokinesis). Your drawings should be labeled, detailed, and in color with a written description to describe each phase!
9. **PAGE 7**: Define Cytokinesis - include a drawing of what this looks like.
10. **PAGE 8**: Describe uncontrolled cell growth (cancer) – include a drawing of what this looks like.
11. Staple your book pages together :-)