Virtual Lab: Cell Reproduction - How can cancer cells be recognized?

**Purpose:** In this investigation you will explore the similarities and differences between the cell cycles of normal cells and cancer cells.

**Objectives:**

* Identify the various phases of the cell cycle
* Compare and contrast the cell cycles of normal and cancer cells

**Procedure: READ all instructions before beginning………**

1. Click the TV/VCR. Click the Play button on the video controller. Watch the video about the cell cycle. You will need to view this to answer questions later.
2. Click More Information to read about cancer statistics and risk factors.
3. On the biology laboratory navigation screen, click the microscope to analyze tissue samples under the microscope. Click the slide carousel to view actual slides of normal and cancerous tissues.
4. Microscopic View Click the microscope to see microscopic view of tissue samples.
5. Click a picture on the Table of Contents to get information about one of the five cell phases. Use the forward and back pointers to move between cards. Click the up arrow to return to the Table of Contents.
6. Compare the normal lung-tissue cells shown through the microscope with the cell phase pictures in the Table of Contents.
7. Label the cells with empty label boxes below them. Decide which phase a particular cell is in. Go to the information card that corresponds to that phase of the cell cycle.
8. Click and Drag the corresponding label from the top of the information card to the label box below the cell.
9. Repeat the labeling procedure for each of the five cells. Click the Check button.
10. Click and drag new labels to any of the cells that are labeled incorrectly. Incorrectly labeled cells will be highlighted in yellow.
11. After you have correctly labeled the five cells, labels will appear below the other cells in the microscopic view. COUNT the number of cells in each phase.
12. Record the data in the Table. Enter the number of cells that are in each phase.
13. Calculate the percentages\* of cells dividing (cells in mitosis) and the percentage of cells at rest (cells in interphase) (\***To Calculate percentage** – divide the *number of cells dividing* by the *total* number of cells, then multiply by 100, do the same for *cells at rest*)
14. Examine other tissues by clicking the Tissue Slides box and selecting a tissue sample.
15. Repeat the labeling, checking, and recording procedures for each of these tissues.
16. Click Reset at any time to erase your labels on the cells in the microscopic vies and get a new set of lung, ovary, and stomach tissue samples.
17. Click the Return button at any time to save the placement of your labels and the present tissue samples and to return to the biology laboratory and navigation screen.
18. Slide Carousel Click the slide carousel to view photographs of actual lung and stomach tissues.
19. Click a slide and drag it to the slide carousel.
20. Repeat this procedure for each of the four slides.
21. Click the Return button to return to the biology laboratory navigation screen.
22. After analyzing the tissue samples under the microscope and viewing the actual slides, answer the Analyze and Conclude questions.

Analyze and Conclude: Questions from Video and Information, Slides, and Activity

SLIDES:

1. According to the slides, the name of the stomach cancer was \_\_\_\_\_.
2. This slide was magnified \_\_\_\_\_ times.
3. The normal stomach tissue shown were of the \_\_\_\_\_\_ cells; and they were magnified \_\_\_ times.
4. Draw and label a cell in each of these stages of mitosis:
	1. Interphase
	2. Prophase
	3. Metaphase
	4. Anaphase
	5. Telophase

TV/VCR:

1. The cell cycle is a complex series of events consisting of \_\_\_\_ and \_\_\_\_.
2. In interphase: the chromosomes are not visible, they are still in the form of uncoiled \_\_\_\_.
3. In animal cells the \_\_\_\_ duplicate themselves.
4. Prophase: \_\_\_\_\_ chromosomes are formed and the \_\_\_\_\_ disappears.
5. Metaphase: each chromatid is attached to a fiber by a \_\_\_\_\_.
6. Anaphase: \_\_\_\_\_ chromatids are pulled apart to opposite parts of the cell.
7. Telophase: the final stage of mitosis where \_\_\_ daughter cells are formed.

INFORMATION BUTTON:

1. Compare (list) the statistics that how the number of deaths in 1995, related to each type in cancer: a. Lung = \_\_\_\_\_\_ b. Ovarian = \_\_\_\_\_\_\_ c. Stomach = \_\_\_\_\_\_\_
2. What **two** factors do scientists say contribute to these cancers?
3. List **two** risks associated with EACH type of cancer, and identify with which cancer the risk is related …. (6 total answers) a. Lung = \_\_\_\_\_\_ b. Ovarian = \_\_\_\_\_\_\_ c. Stomach = \_\_\_\_\_\_\_

ACTIVITY:

1. In which type of cell(s) did you calculate the highest percentages of cells dividing?
2. In which type of cell(s) did you calculate the highest percentages of cells at rest?

CONCLUSION:

1. What conclusion can you draw from this activity about cancer and cell division?