**VLab: Cell Division NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Tutorial: The Mitotic Cell Cycle**

Using the Tutorial, look closely at the entire cell cycle: interphase, the four phases of mitosis (prophase, metaphase, anaphase, and telophase) and cytokinesis.

1. If Tutorial mode is not selected, click on the Tutorial tab. Notice the Cell Phase dial at the bottom left of the screen. Interphase is the first phase displayed.
2. Use the Play button to see the animation of the cell cycle.
3. Use the Phase control button to move through the cycle and select a specific phase. Use the Step control button to observe each phase closely. Then answer the following questions about each phase.

**Interphase**

* 1. Describe the general shape and appearance of the cell. What happens to the cell during interphase?
  2. Describe the nucleus of the cell.
  3. Describe the chromosomes.
  4. How many centrioles does this cell contain?

**Prophase**

* 1. What happens to the nucleus during prophase?
  2. How many chromosomes does this cell contain? What happens to the chromosomes during prophase?
  3. Describe what happens to the centriole during prophase.

**Metaphase**

* 1. Describe the condition of the nucleus.
  2. Describe what happens to the chromosomes.
  3. Describe the relationship between the chromosomes and the spindle.
  4. How has the overall appearance and shape of the cell changed?

**Anaphase**

* 1. Describe the condition of the nucleus.
  2. Each chromosome is composed of two duplicate copies called chromatids. Describe what happens to the chromatids during anaphase.
  3. What happens to the centrioles and spindle during this phase?
  4. As the chromosomes move to opposite ends of the cell, what path do they take in relation to the spindle?
  5. Describe the overall appearance and shape of the cell.

**Telophase**

* 1. Describe what happens to the chromosomes.
  2. What happens to the nucleus during telophase?
  3. Describe what happens to the centrioles and spindle.
  4. Describe the overall appearance and shape of the cell.

**Cytokinesis**

* 1. Describe what happens to the original cell in cytokinesis.
  2. Describe what happens to the nucleus during cytokinesis.
  3. Describe what happens to the chromosomes.
  4. Describe what happens to the centrioles and spindle.
  5. What is the result of mitosis and cytokinesis?

**Quiz: Test Your Knowledge**

Test your understanding of cell division with the Quiz. Focus on the key features of cell division (especially the chromosomes) as you proceed.

1. Click on the Quiz tab at the top of the screen. A photograph of a cell at a specific phase of the cell division cycle will be displayed in Panel 1. Select the correct phase from the listing below the monitor.
2. Build an illustration of this phase using components from each category in Panel 2 starting with Cells. For each category, the selected image appears in the target area of the panel.
3. Make sure you select an image from every category. Then, click Check My Work to find out if you are correct. Any incorrect components are indicated by a red light above the category. Choose alternative selections for each incorrect component and check your work again.
4. Once all the necessary components within the cell have been identified indicate this phase's place in the cell cycle by clicking the appropriate button in Panel 3.
   1. If the placement is incorrect, you are directed to try again.
   2. If correct, the image of the cell appears in the window for that button. A photograph of another phase of the cell cycle will appear in the monitor in Panel 1.
5. Repeat the procedure until all the phases have been identified, built, and ordered correctly.