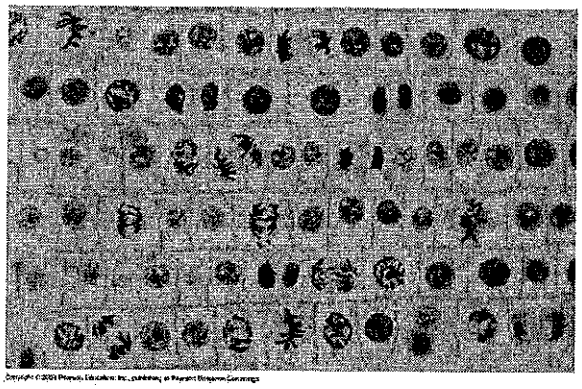
Name: Key **AP Bio: Cell Cycle**

Observing Onion Root cells

The tip of an onion plant's roots are growing rapidly. Roots = Somatic cells

1. Which M phase would you expect that they are carrying out? Mitosis

Below shows a diagram of what those cells would look like under a microscope. Another AP biology class has taken the time to observe close to 600 cells in one onion root and identify which stage of the when the slide was created. The data is shown below.



Trial #1

Total # of cells: 594		
Phase of Mitosis	Number of Cells in that phase	Percentage
Interphase	569	95.79%
Prophase	16	2.69%
Metaphase	2	0.34%
Anaphase	3	0.51%
Telophase	4	0.67%

2. Which stage is the slowest? Metaphase Why does this make sense? (Hint: What is happening during this phase?) It's a quick phase - not a lot going on here, chromosomes line up single file along the equator

3. Which stage is the fastest? Interphase Why does this make sense? (Hint: What is happening during this phase?)

It's the majority of the life of the cell - this includes G_1, S, and G_2.

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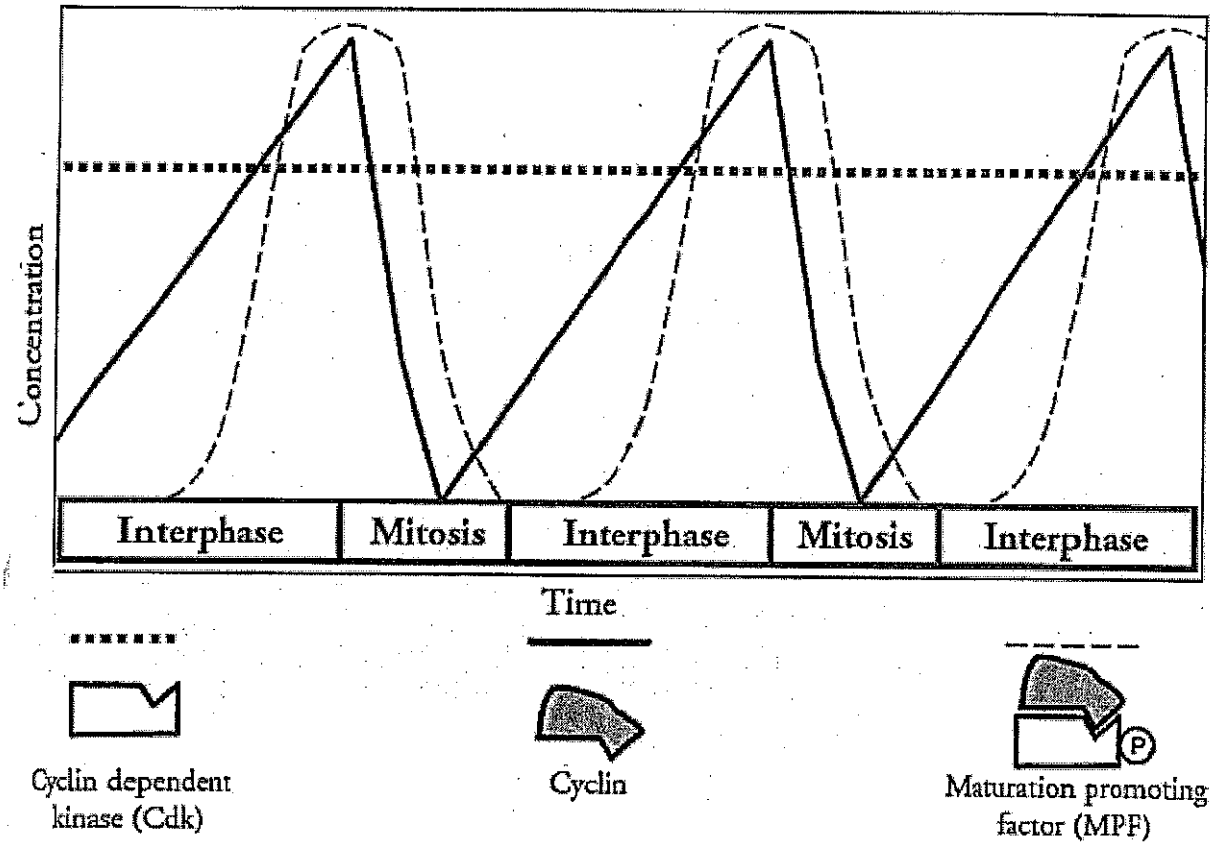
Regulating the Cell Cycle

Below is a graph showing the concentration of cyclin and the CDK complex during the different stages of the cell cycle. Notice that the rise in cyclin molecules is used as a checkpoint for a cell to move into mitosis from interphase of the cell cycle.

Review the statements below as well as the cell cycle regulation diagram you had received previously to support the information shown here.

Model 2 – Cyclin and Kinase

What determines if a cell is in G^0 or going through the cell cycle? What determines a "pass" at a checkpoint during the cell cycle? These questions are answered by both intracellular and extracellular chemical signals. **Growth factors** are one type of chemical signal. These proteins are released by specialized cells and trigger cell division. Surface proteins tell cells to stop dividing if the environment gets too crowded and cells are touching with too much pressure. Enzymes called **kinases** provide the energy (through phosphorylation) for many of the processes that must happen for successful mitosis to occur.



peak = successful passage through checkpoint before Mitosis.