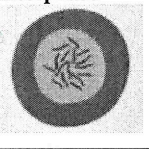

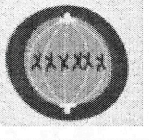
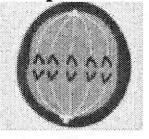


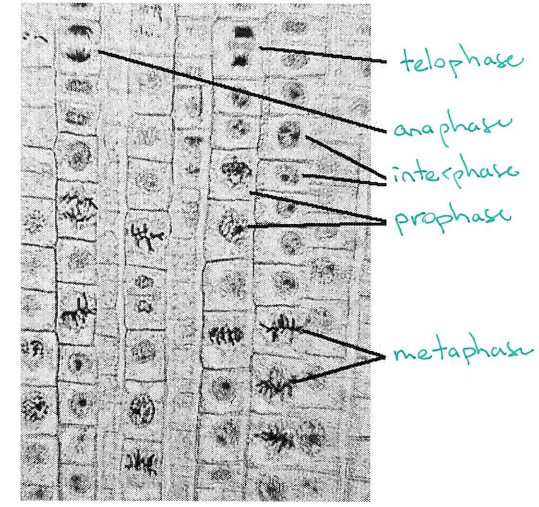


Onion Root Tip "Lab" Worksheet (Science 9 Pathways)

1. Fill out the following comparison table for each of the stages of the cell cycle. Point form is okay.

	Nucleus	DNA appearance	Summarize what is happening.
Interphase 	-present	-chromatin	-regular cell processes, growth (size, # of organelles) -DNA replication
Prophase 	-nuclear membrane breaks down	-chromosomes (2 sister chromatids each)	-DNA condenses -nucleus disappears
Metaphase 	-absent	-chromosomes (2 sister chromatids each)	-chromosomes line up at middle of cell, attached at centromeres to spindle fibres
+Anaphase 	-absent	-chromosomes (1 sister chromatid each)	-spindle fibres pull sister chromatids to opposite ends of cell
Telophase 	-nuclear membrane reforms	-chromosomes (1 sister chromatid each)	-2 distinct nuclei form
Cytokinesis 	-present (2 of them)	-chromosomes decondensing into chromatin as cell re-enters interphase	-separation of cell membrane + cytoplasm.

2. Label the stages that you see here (interphase, prophase, metaphase, anaphase, telophase).



3. How does interphase differ from the other phases? (What happens during it? How does it look? What's going on with the cell structures like DNA and the nucleus?)

- DNA exists as chromatin in the nucleus, not as condensed chromosomes
- It is the longest stage of the cell cycle.
- It is where the cell performs its regular cell functions.

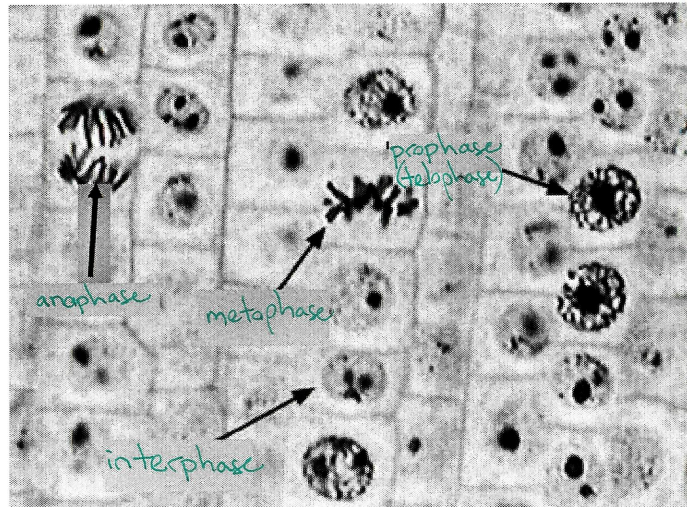
4. Look closely at the cells you labelled "interphase" in #3.

- a) What is odd about their appearance?
 - Multiple nuclei!
- b) What are some signs that this is indeed interphase and not a different phase?
 - Chromosomes are not condensed. The nuclei are still distinct.

5. What observation(s) can you make from this slide that suggest mitosis is a continuous, ongoing process? Explain.

- Many cells are in an "in-between" phase and hard to classify as one specific phase.
- The slide is a "snapshot" at one point in time: yet we can see all the stages in this one snapshot. Suggests that cells are constantly dividing.

6. Label the phases indicated by the arrows.



7. Does one stage of the cell cycle occur more frequently than others? Identify the stage and explain why it is the most common. (Use the image from #6 to help you. "It is the longest stage of the cell cycle" is not a good explanation.)

- Interphase is the most frequent stage.
- Occurs most frequently because this is the "entire point" of the cell's existence: this is when it carries out all the functions it was meant to perform. Only at the end of its life cycle will it undergo cell division.

8. This is the onion root tip. Which part(s) of the tip are undergoing the most rapid growth? Circle it and explain what observation(s) led you to this conclusion.

- Most rapid growth (the most cells undergoing mitosis) occurs at the outer leading edge of the root, which is growing and advancing into the soil.
- Observations: this section is darkest because the DNA is condensed and undergoing mitosis in the majority of the cells here. In the regions that I have not highlighted, the cells appear lighter as they are in interphase.

