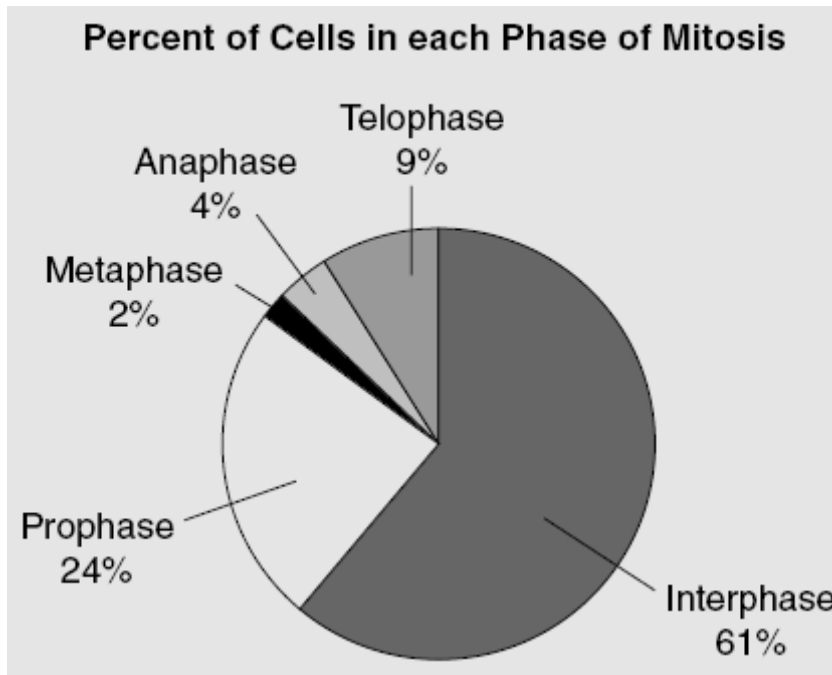


CHAPTER 16	Investigation 16.B: Observing the Cell Cycle in Plant and Animal Cells Answer Key	BLM 16.2.6A
ANSWER KEY		

Answers to Analysis Questions

- The size of the cells increased as one moved further away from the root tip.
 - The cells farther away from the root tip were more rectangular, while the recently divided cells were nearly square.
 - There were fewer dividing cells as one moved further away from the root tip.
- The whitefish cells were larger than the onion root-tip cells.
 - The more mature onion root-tip cells were more rectangular, while cells that had recently divided were nearly square. Whitefish cells were more round in shape.
 - There is little or no difference in chromosome arrangements. You could make reference to the appearance of the cell plate in the onion cells and the appearance of an indentation (“cleavage furrow”) in the whitefish cells during cytokinesis. You might be able to observe centrioles in the whitefish cells; these do not exist in plant cells.
- The following is an example of a pie graph that you should generate.



- No, cell division only takes place near the tip of the onion root. Cells closer to the root tip will undergo cell division much more rapidly than cells further away from the growing region of the root.

CHAPTER 16	Investigation 16.B: Observing the Cell Cycle in Plant and Animal Cells (cont'd)	BLM 16.2.6
HANDOUT		

Answer to Conclusion Question

5.

Phase	Animal cells	Plant cells
Interphase	Most of the cell's life is spent in the growth stage, which is called interphase . During interphase, the cell carries out its regular metabolic functions and prepares for its next division.	Most of the cell's life is spent in the growth stage, which is called interphase . During interphase, the cell carries out its regular metabolic functions and prepares for its next division.
Prophase	During prophase, the chromatin condenses into tightly packed chromosomes. The nuclear membrane breaks down, releasing the chromosomes into the cytoplasm. The nucleolus disappears. One pair of cylindrical organelles, called centrioles, moves apart to opposite poles of the cell. As the centrioles move apart, a network of fibres called the spindle apparatus forms between them.	Plant cells do not have centrioles, but they do form a spindle apparatus. Otherwise the events are the same in both plants and animal cells.
Metaphase	During metaphase, spindle fibres from opposite poles attach to the centromere of each chromosome. The spindle fibres attach in such a way that one sister chromatid is linked to one pole, while the other sister chromatid is linked to the opposite pole. The spindle fibres guide the chromosomes to the equator, or centreline, of the cell.	The events are the same in both plant and animal cells.
Anaphase	During anaphase, each centromere splits apart and the sister chromatids separate from one another. The spindle fibres that link the centromeres to the poles of the cell shorten. As these fibres shorten, sister chromatids are pulled to opposite poles. At the same time, other microtubules in the spindle apparatus lengthen and force the poles of the cell away from one another. At the end of anaphase, one complete diploid set of chromosomes has been gathered at each pole of the elongated cell.	The events are the same in both plant and animal cells.

CHAPTER 16	Investigation 16.B: Observing the Cell Cycle in Plant and Animal Cells (cont'd)	BLM 16.2.6
HANDOUT		

Phase	Animal cells	Plant cells
Telophase	Telophase begins when the chromatids have reached the opposite poles of the cell. The chromatids begin to unwind into the longer and less visible strands of chromatin. The spindle fibres break down. A nuclear membrane forms around each new set of chromosomes, and a nucleolus forms within each new nucleus.	The events are the same in both plant and animal cells.
Cytokinesis	Cytokinesis is the division of the cytoplasm to complete the creation of two new daughter cells. During cytokinesis an indentation forms in the cell membrane along the cell equator. This indentation deepens until the cell is pinched in two. The cytoplasm and organelles divide equally between the two halves of the cell. Cytokinesis ends with the separation of the two daughter cells. The daughter cells are now in interphase, and the cycle continues.	The rigid cell wall of a plant cell is much stronger than the membrane of an animal cell. The cell wall does not furrow and pinch in during cytokinesis. Instead, a membrane called a cell plate forms between the two daughter nuclei.