Exercise 1: Observing Mitosis in Cells

Photo 1: Plant Cell – G2 of Interphase

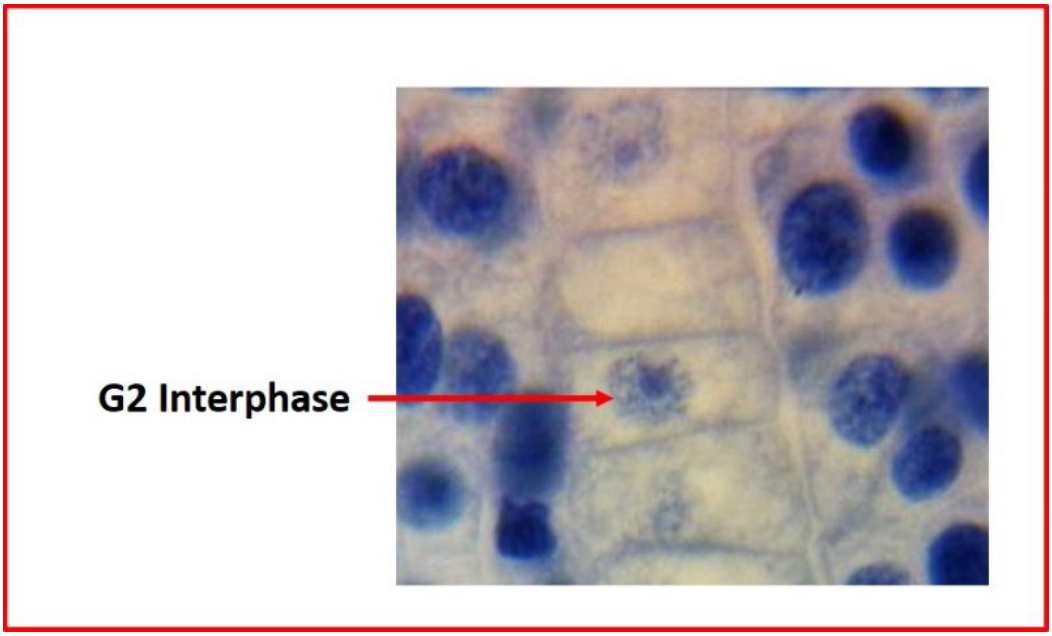

Table 1: Microscopy Magnification

Phase	Magnification
Plant Cell – G2 of Interphase	600x
Plant Cell – Prophase	600x
Plant Cell – Prometaphase	600x
Plant Cell – Metaphase	600x
Plant Cell – Anaphase	600x
Plant Cell – Telophase/Cytokinesis	600x
Animal Cell – G2 of Interphase	150x
Animal Cell – Prophase	150x
Animal Cell – Prometaphase	150x
Animal Cell – Metaphase	150x
Animal Cell – Anaphase	150x
Animal Cell – Telophase/Cytokinesis	150x

Photo 2: Plant Cell – Prophase

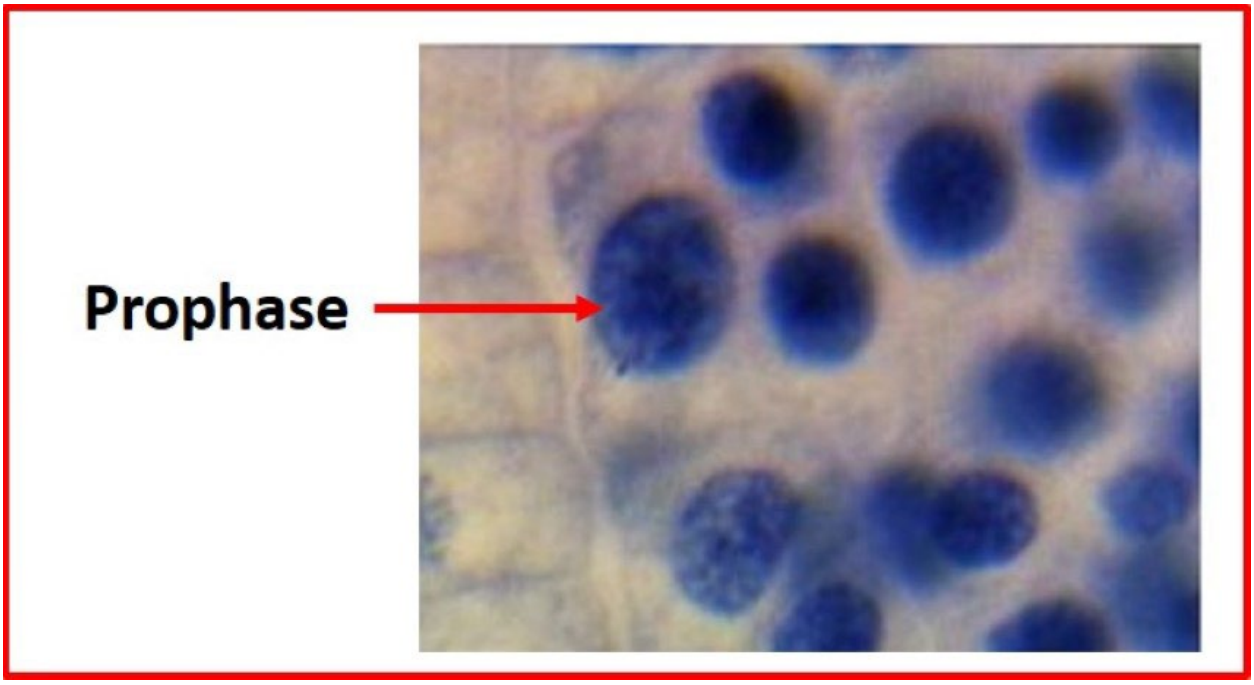

Photo 3: Plant Cell – Prometaphase

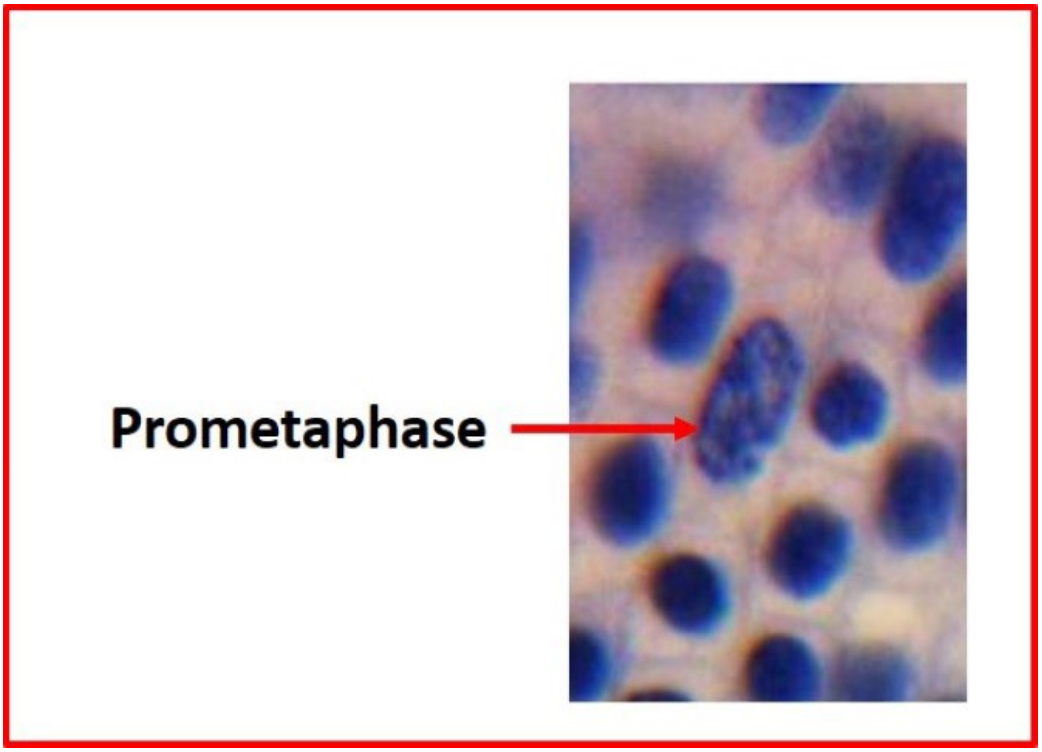

Photo 4: Plant Cell – Metaphase

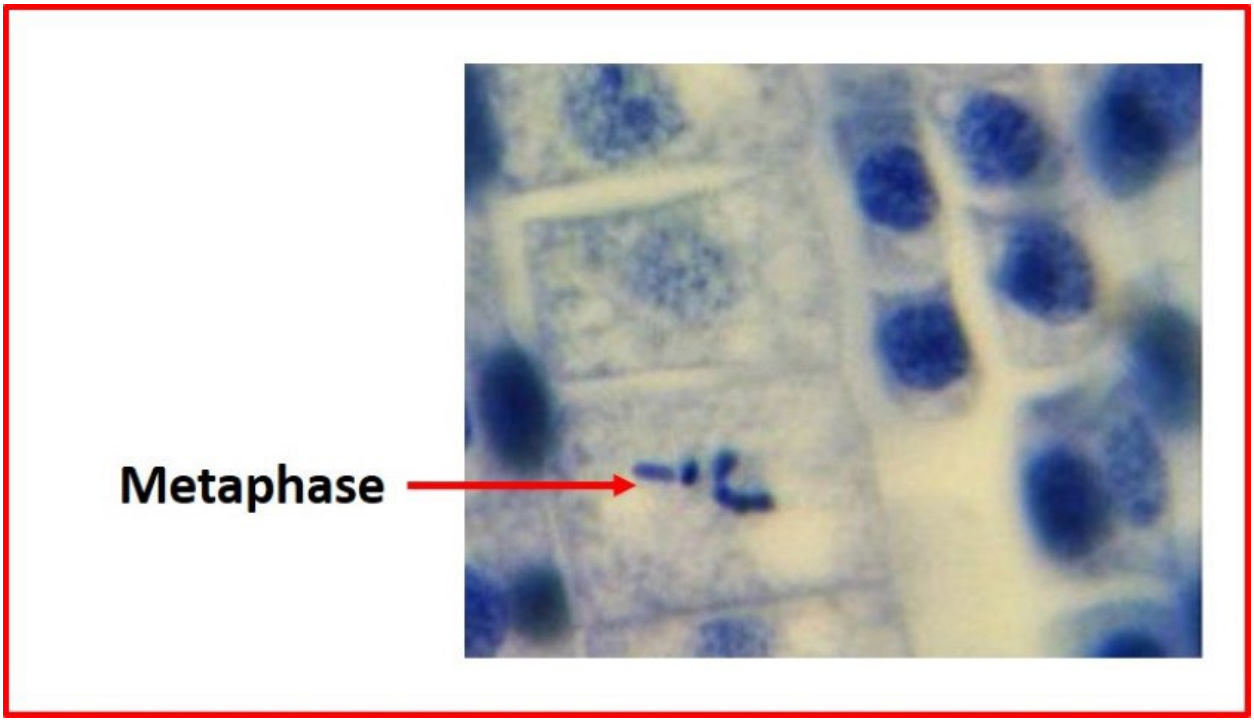

Photo 5: Plant Cell – Anaphase

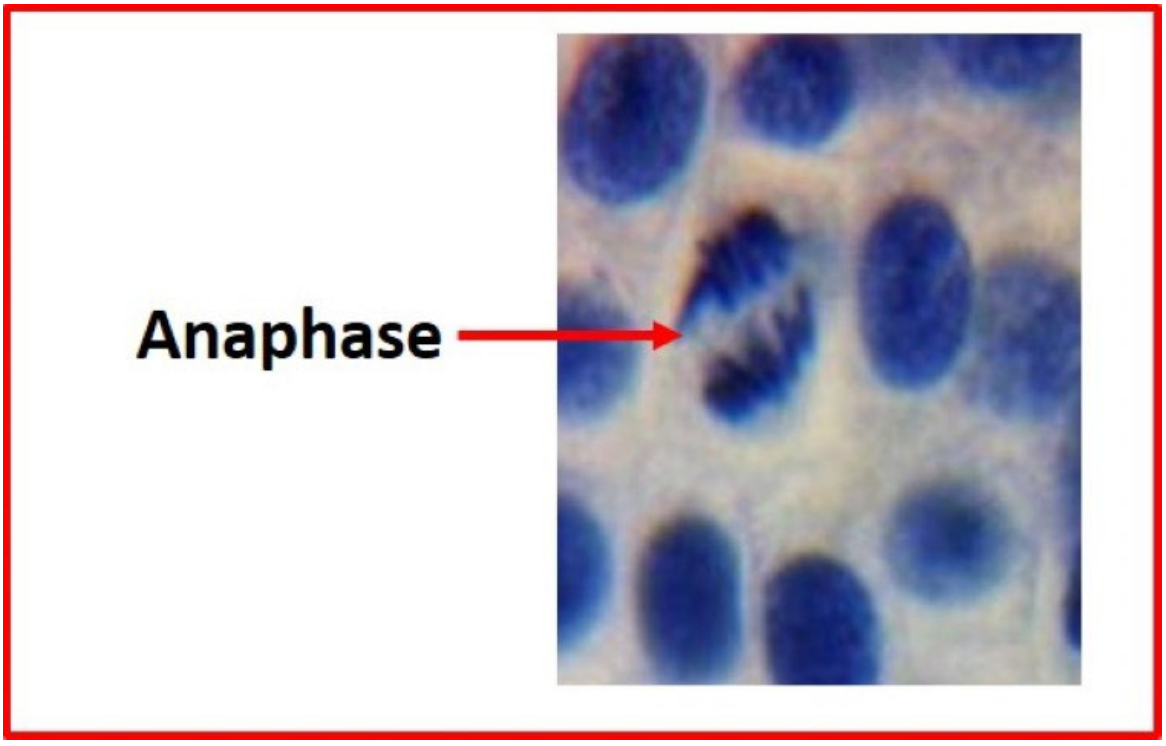

Photo 6: Plant Cell – Telophase/Cytokinesis

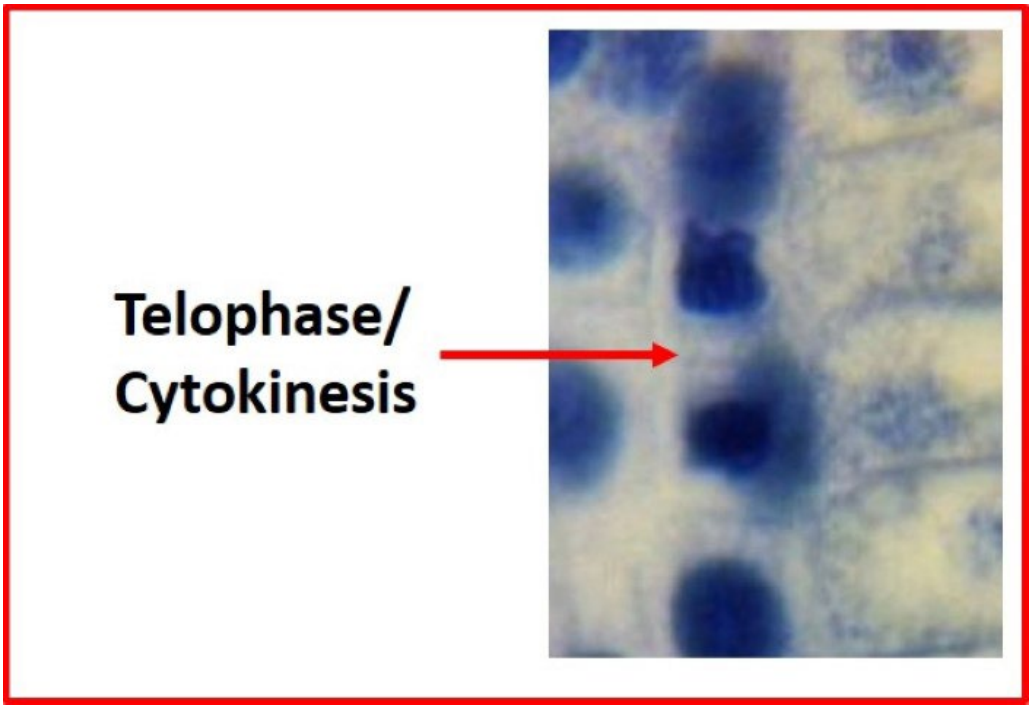

Photo 7: Animal Cell – G2 of Interphase

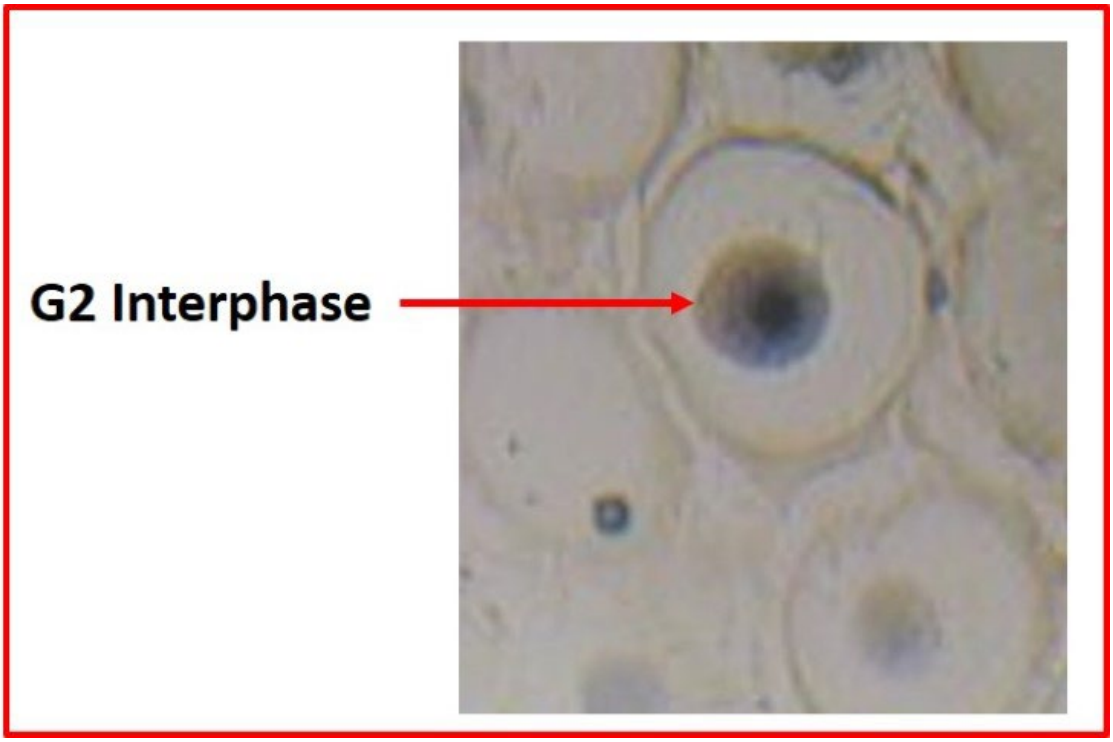

Photo 8: Animal Cell – Prophase

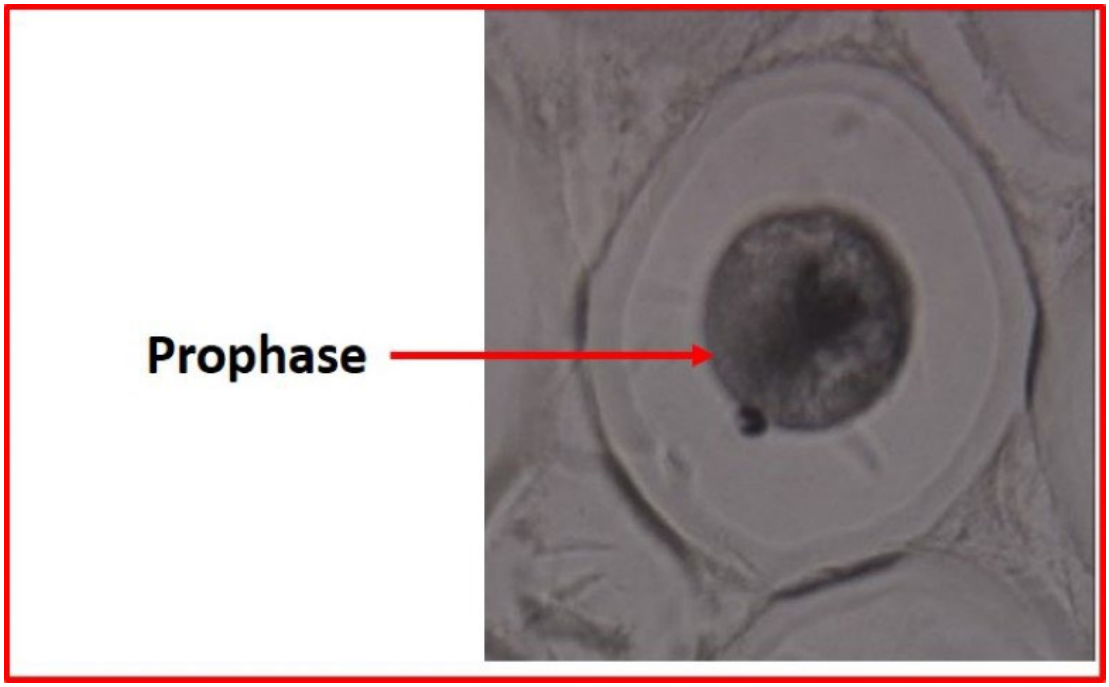

Photo 9: Animal Cell - Prometaphase

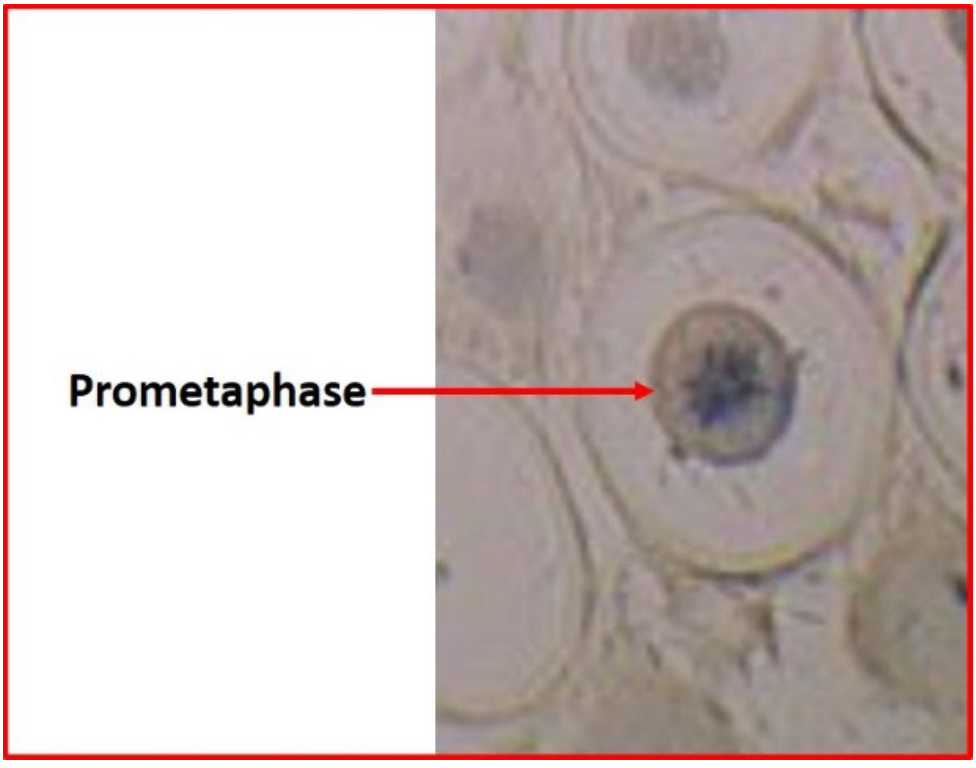

Photo 10: Animal Cell – Metaphase

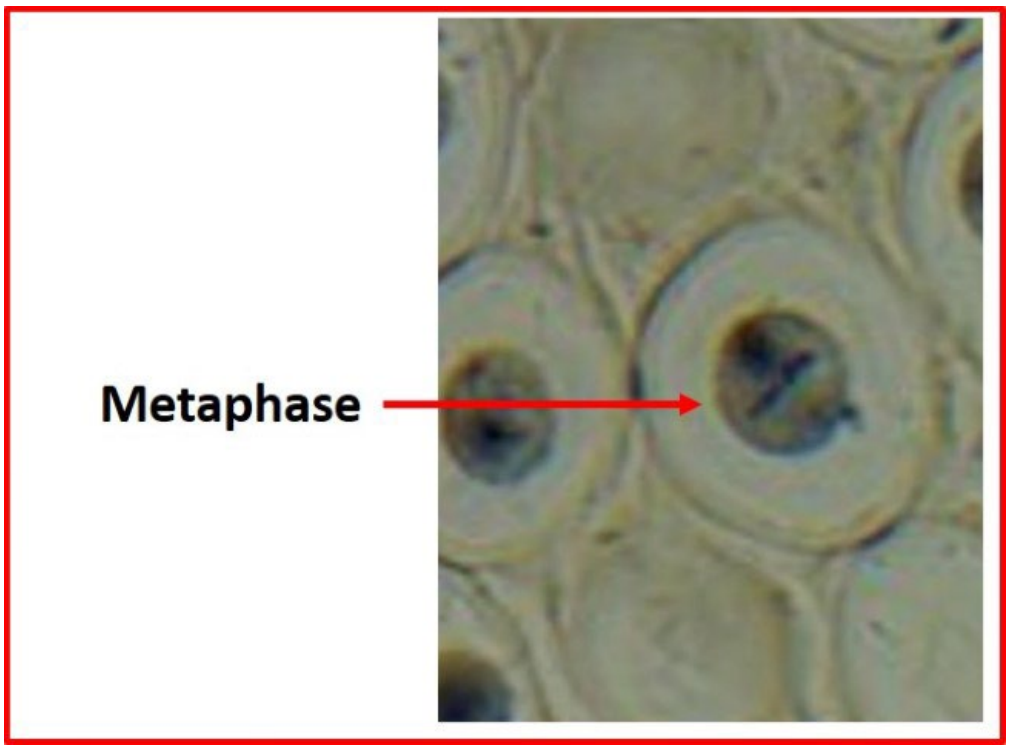

Photo 11: Animal Cell – Anaphase

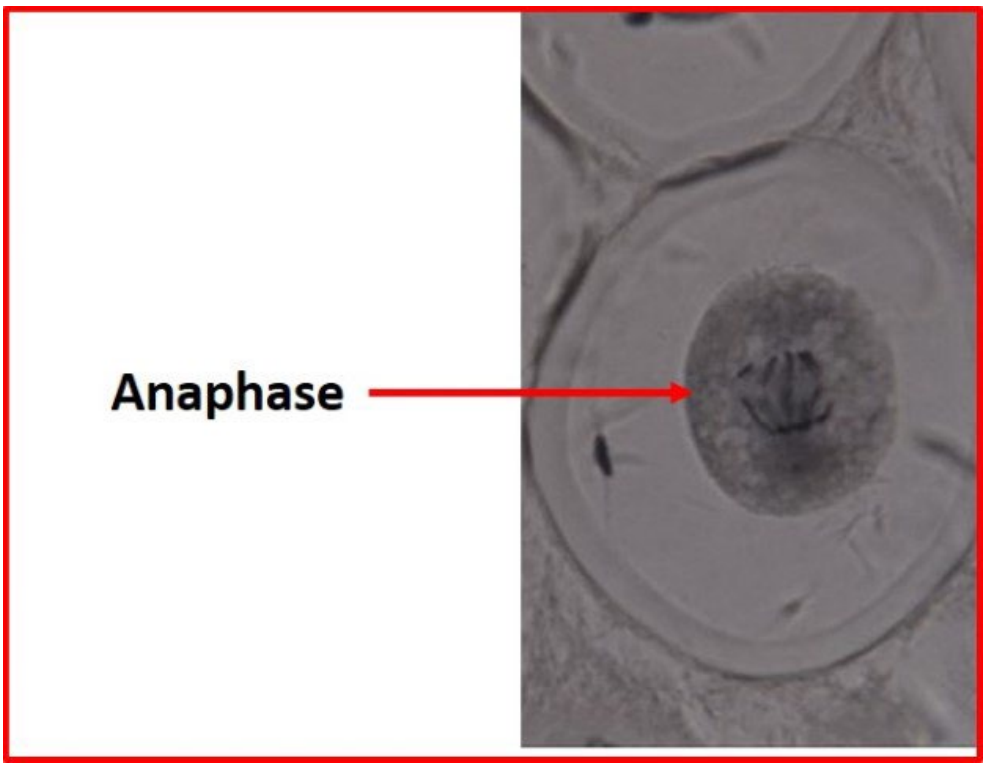

Photo 12: Animal Cell – Telophase/Cytokinesis

Question 1

What percentage of the cell cycle does the mitotic phase occupy? How was this supported when viewing the onion root tip slide?

The mitotic phase accounts for 10% of the cell cycle. This was supported by the onion root tip slide in which only about 10% of the cells were undergoing mitosis.

Question 2

How did mitosis differ between the plant and animal cells viewed in this exercise? Reference specific photos to support your explanation.

*Telophase/cytokinesis differed between the onion root tip cells and the whitefish blastula cells. In the blastula, a cleavage furrow formed, pinching the cell in two as shown in **Photo 26**. In the root tip, the cells divided through the formation of a cell plate as shown in **Photo 20**.*

Extension Question

Several bird species have lost the ability to fly. Apply your knowledge of comparative vertebrate anatomy to predict how the skeletal structure of a flighted bird differs from that of a flightless species that moves solely by walking/running.

The flightless species would be expected to have relatively thicker/heavier bone structure to support a strictly terrestrial/walking environment. The pelvic girdle of flightless birds should allow greater range of motion and also contain the largest muscle mass compared to flying birds which should have more articulation and muscle mass in the pectoral girdle. Bones of the wings may be reduced in size for the flightless species. The keel should be reduced or absent in the flightless species since it is no longer needed for flight muscle attachment.