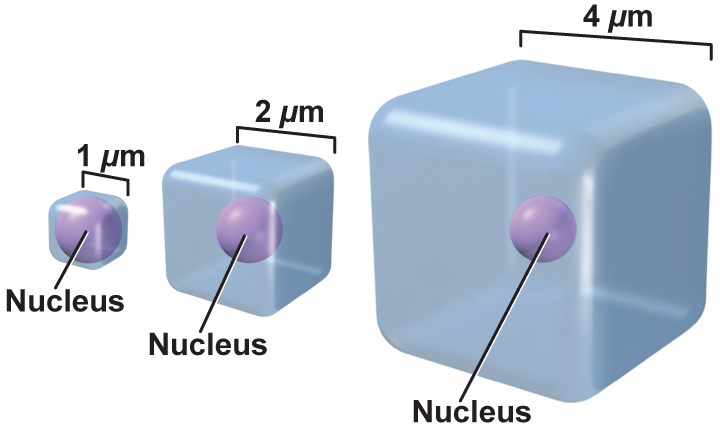
Chapter 9 Section 1 Student Notes

**Ratio of Surface Area to Volume**



* As the cell grows, its volume increases much more rapidly than the surface area.
* The cell might have difficulty supplying nutrients and expelling enough waste products.

**Transport of Substances**

* Substances move by diffusion or by motor proteins.
* Diffusion over large distances is slow and inefficient.
* Small cells maintain more efficient transport systems.

**Cellular Communications**

* The need for signaling proteins to move throughout the cell also limits cell size.
* Cell size affects the ability of the cell to communicate instructions for cellular functions.

The Cell Cycle

* Cell division prevents the cell from becoming too large.
* It also is the way the cell reproduces so that you grow and heal certain injuries.
* Cells reproduce by a cycle of growing and dividing called the cell cycle.
* Interphase is the stage during which the cell grows, carries out cellular functions, and replicates.
* Mitosis is the stage of the cell cycle during which the cell’s nucleus and nuclear material divide.
* Cytokinesis is the method by which a cell’s cytoplasm divides, creating a new cell.

The Stages of Interphase

* The first stage of interphase, G1
  + - The cell is growing, carrying out normal cell functions, and preparing to replicate DNA.
* The second stage of interphase, S
  + - The cell copies its DNA in preparation for cell division.
* The third stage of interphase, G2
  + - The cell prepares for the division of its nucleus.

