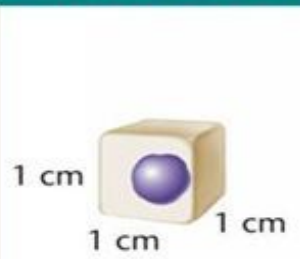
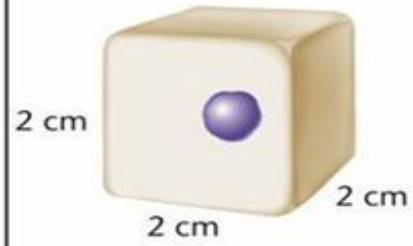
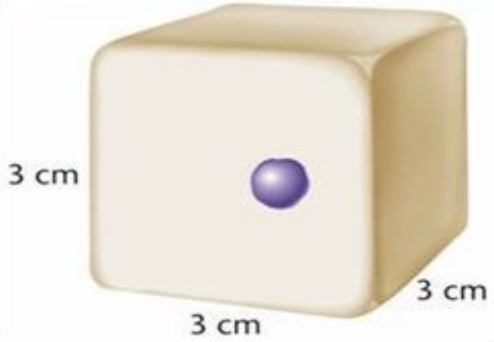
Ratio of Surface Area to Volume in Cells			
Cell Size			
Surface Area (length x width x 6)	1 cm x 1 cm x 6 = 6 cm^2	2 cm x 2 cm x 6 = 24 cm^2	3 cm x 3 cm x 6 = 54 cm^2
Volume (length x width x height)	1 cm x 1 cm x 1 cm = 1 cm^3	2 cm x 2 cm x 2 cm = 8 cm^3	3 cm x 3 cm x 3 cm = 27 cm^3
Ratio of Surface Area to Volume	6 / 1 = 6 : 1	24 / 8 = 3 : 1	54 / 27 = 2 : 1

As the length of a cell increases, its volume increases faster than its surface area.

This causes the ratio of surface area to volume to decrease, which causes serious problems for the cell.

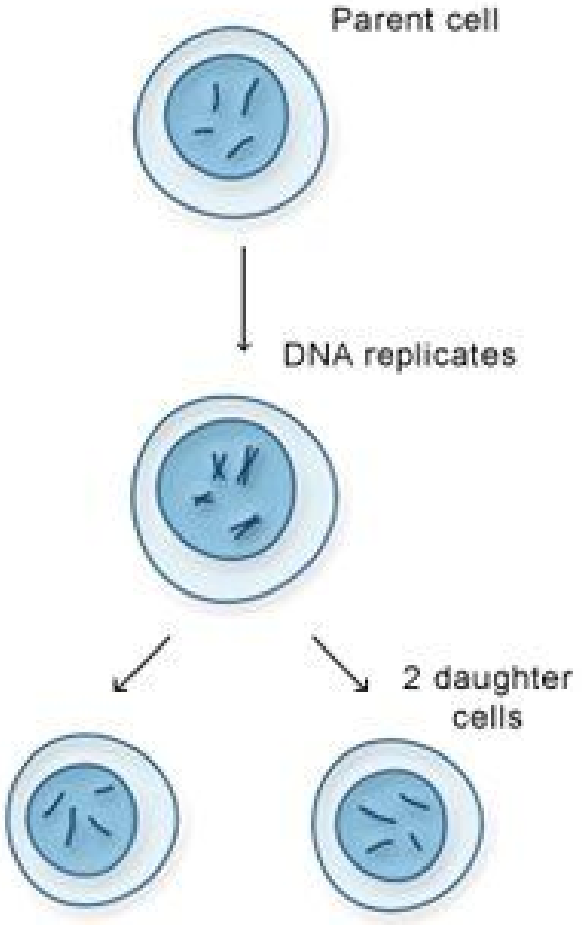
Before a cell becomes too large, a growing cell divides forming two “daughter” cells,

This process is called **cell division**.

Before cell division occurs, the cell copies all of its DNA.

Duplication of DNA solves the problem of information sending & storage.

Division also solves the problem of size by increasing the surface area to volume ratio for efficient exchange of materials with the environment.



U.S. National Library of Medicine