

Cellular Reproduction

Chapter 9

Section 9.1

CELLULAR GROWTH

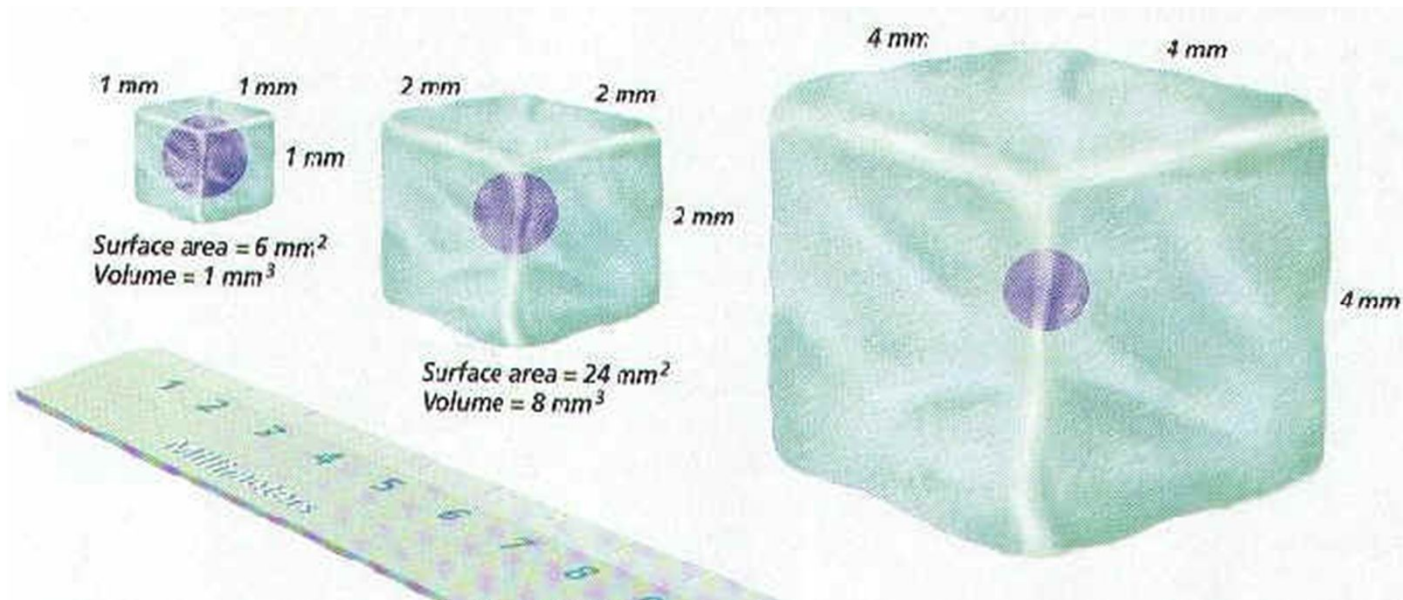
Review of Cell Theory

- Three parts:
 - 1. all living organisms are composed of one or more cells
 - 2. cells are the smallest unit of living organisms
 - 3. cells arise only from previously existing cells
- Remember cell organelles:
 - Chromosomes – contains DNA and moves it between cells
 - Microtubules – long, hollow tubes that help move things in a cell
 - Microfilaments – thin threads that give the cell shape and movement
 - Cell membrane – lets things in and out of all cells
 - Cell wall - only in plant cells
 - Nucleus – manages cellular functions and contains DNA
 - Nucleolus – where ribosomes are made within the nucleus

Cell Size Limitations

- Cells grow and divide until they reach their size limit
- Once they reach their limit they either stop growing or divide
- Most cells are less than 100×10^{-6} m in diameter
 - This is smaller than the period at the end of this sentence.
- **Key factor that limits cell size...**
 - Ratio of its surface area to its volume
- Surface area – area covered by plasma membrane
- Volume – space taken up by the inner contents of the cell

Cell Size Limitations



- The smallest cube has a ratio of 6:1
- The middle cube has a ratio of 3:1
- The largest cube has a ratio of 2:1
- Larger cell = lower ratio
- Larger ratio = harder to sustain processes

Cell Size Limitations

- Smaller cells can move substances easier than large cells
- As substances enter the plasma membrane they move within the cell
- Larger distances take longer to move through
- Cells remain small to maximize the movement within them

