Cell Size

- Small cells = higher SA:V ratio
- The larger SA:V ratio, the more efficient + effective
- Folds increase surface area
  - Villi and microvilli

Compartmentaliza

- Certain reactions and functions occur in specific sections of the cell
  - Efficient
  - limits

Endosymbiosis

- Organelles (mitochondria + chloroplasts) evolved from independent prokaryotic cells
- Supports the idea of compartmentalization
- Evidence:
  - Double

Double Membrane
Contains pores to regulate what enters and exits; selectively permeable; Fluid Mosaic Model
Imbedded Items:
- cholesterol (helps fluidity, 4 ring structure)
- Glycolipids + Glycoproteins (short branched carb covalently bonded w/ Protein or Lipid; serves as identifiers)
- Transmembrane (all the way through), integral(penetrate interior), and peripheral (outside only) proteins

Cell Wall (plants and fungi only)
Made of polysaccharides: Cellulose(plants) Chitin(fungi)

Nucleus
Holds cell's genetic info
- Nucleoles : region of nucleus which makes rRNA, helps make

Prokaryotes (ex: bacteria)
- No internal-membrane bound DNA
- Circular DNA
- Smaller than

Eukaryotes
- Contain nucleus and organelles
- Animal, plants, fungi
- Larger than prokaryotes

Smooth ER
Detoxifies and synthesizes lipids

Rough ER
ER w/ Ribosomes. Synthesize membrane protein.

Golgi Apparatus
Sorts and packages proteins made on rough ER

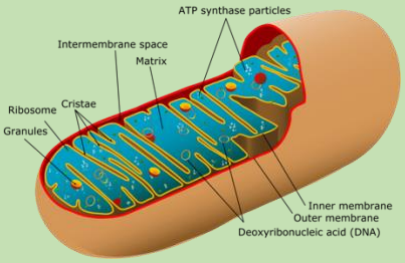
Vacuoles
Storage of waste and other materials.
Central vacuole (plant cells)

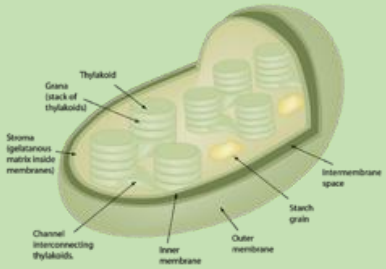
Free floating ribosomes
Synthesize proteins that will stay inside the cell

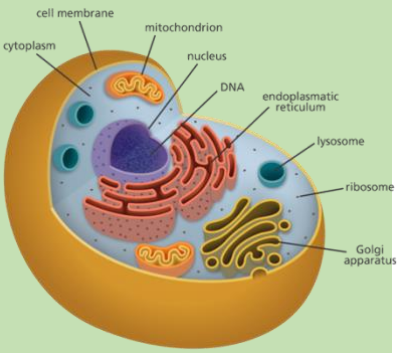
Lysosomes
Digest foreign substances and worn out organelles; kill pathogens; Perform apoptosis

Energy Organelles
Mitochondria
Cite of cellular respiration (produce ATP)
Structure:
- Double membrane with folds (cristae)
- Electron transport chain and oxidative phosphorylation takes place along inner membrane
- Matrix (Krebs cycle)

Chloroplasts
Site of photosynthesis
Structure:
- Double membrane
- Grana: stack of thylakoid (contains chloroplasts)
- Stroma: fluid in chloroplasts (Calvin cycle location)

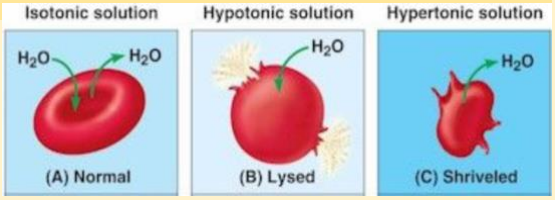






Passive Transport
Diffusion: high → low concentration
Osmosis : movement of solvent (water) into a higher solute concentration (move into hypertonic area)
Facilitated Diffusion: movement of molecules or ions across a biological membrane via transmembrane proteins

Water Potential
Water will move from an area of high WP to an area of low WP.
Physical factors:
- If Solute increases, WP decrease
- If pressure increases, WP increases



Active Transport
Needs ATP to go against concentration gradient
Protein Channel:
Charged channels due to uneven ratio of + and – ions. The protein changes shape for diff substances
Bulk Transport:
Endocytosis: brings IN substances
- Phagocytosis: solids
- Pinocytosis: liquids
- Receptor mediated endocytosis: must bind to receptor before entering

Exocytosis: pushed OUT substances
- Internal vesicles fuse w/ cell membrane and secrete macromolecules