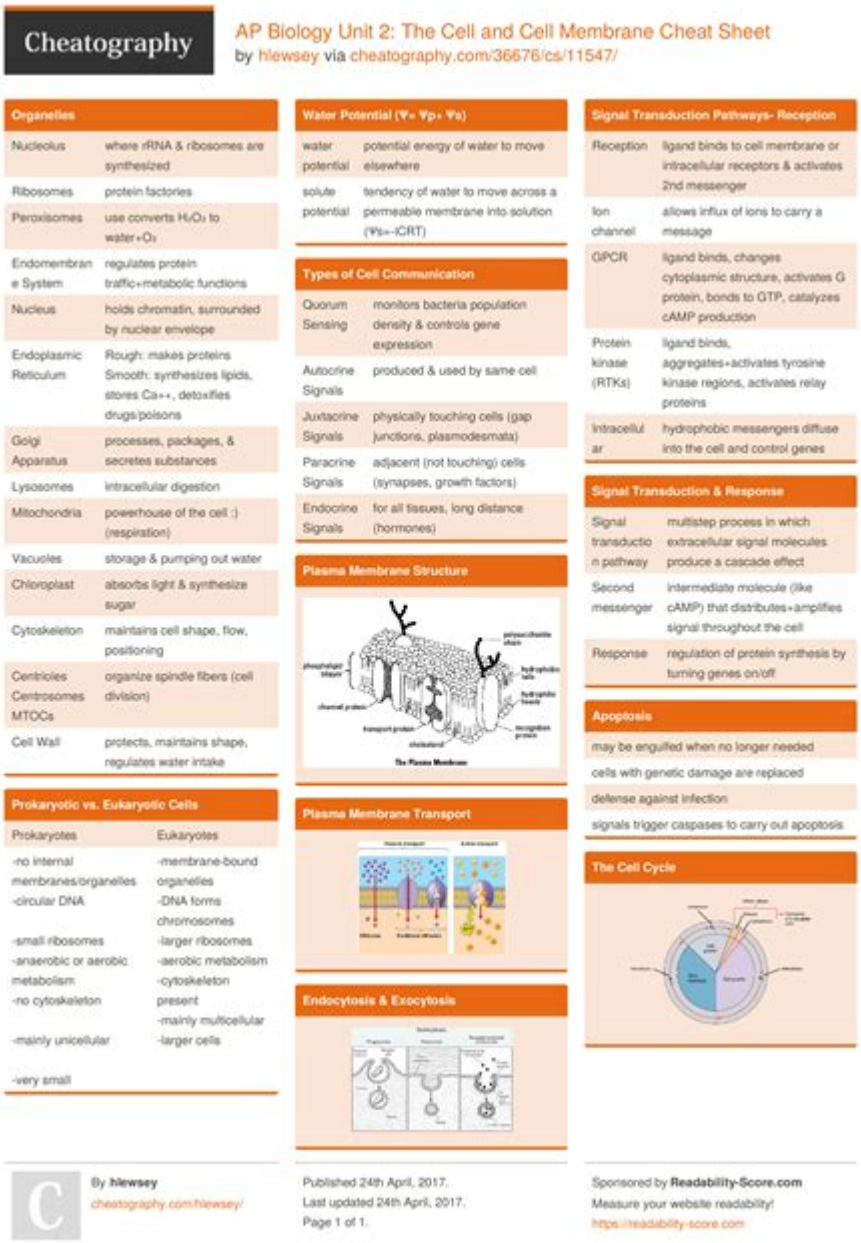
Ap Bio Unit 2 Cheat Sheet



Cheatography

AP Biology Unit 2: The Cell and Cell Membrane Cheat Sheet
by hlewsey via cheatography.com/36676/cs/11547/

Organelles

Nucleolus	where rRNA & ribosomes are synthesized
Ribosomes	protein factories
Peroxisomes	use converts H_2O_2 to water+O_2
Endomembrane System	regulates protein traffic+metabolic functions
Nucleus	holds chromatin, surrounded by nuclear envelope
Endoplasmic Reticulum	Rough: makes proteins Smooth: synthesizes lipids, stores Ca++, detoxifies drugs/poisons
Golgi Apparatus	processes, packages, & secretes substances
Lysosomes	intracellular digestion
Mitochondria	powerhouse of the cell :) (respiration)
Vacuoles	storage & pumping out water
Chloroplast	absorbs light & synthesize sugar
Cytoskeleton	maintains cell shape, flow, positioning
Centrioles Centrosomes MTOCs	organize spindle fibers (cell division)
Cell Wall	protects, maintains shape, regulates water intake

Prokaryotic vs. Eukaryotic Cells

Prokaryotes	Eukaryotes
-no internal membranes/organelles -circular DNA	-membrane-bound organelles -DNA forms chromosomes
-small ribosomes	-larger ribosomes
-anaerobic or aerobic metabolism	-aerobic metabolism
-no cytoskeleton	-cytoskeleton present
-mainly unicellular	-mainly multicellular -larger cells
-very small	

Water Potential ($\Psi = \Psi_p + \Psi_s$)

water potential	potential energy of water to move elsewhere
solute potential	tendency of water to move across a permeable membrane into solution ($\Psi_s = -iCRT$)

Types of Cell Communication

Quorum Sensing	monitors bacteria population density & controls gene expression
Autocrine Signals	produced & used by same cell
Juxtacrine Signals	physically touching cells (gap junctions, plasmodesmata)
Paracrine Signals	adjacent (not touching) cells (synapses, growth factors)
Endocrine Signals	for all tissues, long distance (hormones)

Plasma Membrane Structure

Plasma Membrane Transport

Endocytosis & Exocytosis

Signal Transduction Pathways- Reception

Reception	ligand binds to cell membrane or intracellular receptors & activates 2nd messenger
Ion channel	allows influx of ions to carry a message
GPCR	ligand binds, changes cytoplasmic structure, activates G protein, bonds to GTP, catalyzes cAMP production
Protein kinase (RTKs)	ligand binds, aggregates+activates tyrosine kinase regions, activates relay proteins
Intracellular	hydrophobic messengers diffuse into the cell and control genes

Signal Transduction & Response

Signal transduction pathway	multistep process in which extracellular signal molecules produce a cascade effect
Second messenger	intermediate molecule (like cAMP) that distributes+amplifies signal throughout the cell
Response	regulation of protein synthesis by turning genes on/off

Apoptosis

- may be engulfed when no longer needed
- cells with genetic damage are replaced
- defense against infection
- signals trigger caspases to carry out apoptosis

The Cell Cycle

By hlewsey
cheatography.com/hlewsey/

Published 24th April, 2017.
Last updated 24th April, 2017.
Page 1 of 1.

Sponsored by Readability-Score.com
Measure your website readability!
https://readability-score.com

AP Bio Unit 2 Cheat Sheet: As students dive into the world of Advanced Placement Biology, mastering the material covered in Unit 2 is crucial. This unit focuses on the chemistry of life, providing a foundation for understanding biological processes. With a plethora of information to digest, having a cheat sheet can be an invaluable resource for quick reference and review. In this article, we will break down the key concepts, important molecules, and essential processes that you need to know for Unit 2, ensuring that you are well-prepared for your AP Biology exam.

Overview of AP Biology Unit 2

AP Biology Unit 2 centers around the chemistry that underpins biological systems. Understanding how atoms and molecules interact is fundamental to grasping larger biological concepts. Here are some of the core topics covered in this unit:

- Water and its properties
- Macromolecules: carbohydrates, proteins, lipids, and nucleic acids
- Enzymes and their functions
- The role of pH and temperature in biological processes

Knowing these topics will not only help you in the exam but also in understanding the more complex systems in later units.

Key Concepts in Unit 2

Water: The Essence of Life

Water is a polar molecule with unique properties that make it essential for life. Understanding these properties is critical for any biology student.

- **Polarity:** Water molecules have a partial positive charge on one side and a partial negative charge on the other, leading to hydrogen bonding.
- **Cohesion:** The attraction between water molecules allows for surface tension, which is vital for many biological processes.
- **Adhesion:** Water's ability to stick to other substances is important for processes like capillary action in plants.
- **High Specific Heat:** Water can absorb a lot of heat before increasing in temperature, which helps regulate climate and maintain stable environments for organisms.

Macromolecules: Building Blocks of Life

AP Biology Unit 2 dives deep into the four major macromolecules that are essential for life. Each macromolecule has unique structures and functions.

1. **Carbohydrates:** Composed of carbon, hydrogen, and oxygen, carbohydrates provide energy and structural support. They can be classified into

monosaccharides (simple sugars), disaccharides (two sugars), and polysaccharides (many sugars).

2. **Proteins:** Made up of amino acids, proteins perform a vast array of functions including catalyzing reactions as enzymes, providing structural support, and facilitating transport.

3. **Lipids:** These hydrophobic molecules include fats, oils, and phospholipids, playing critical roles in energy storage, cell membrane structure, and signaling.

4. **Nucleic Acids:** DNA and RNA are the molecules of heredity, responsible for storing and transmitting genetic information.

Enzymes: Biological Catalysts

Enzymes are proteins that speed up chemical reactions without being consumed in the process. Understanding their function is vital for AP Biology.

- **Active Site:** The region on an enzyme where substrate molecules bind and undergo a chemical reaction.
- **Substrate:** The reactant molecule upon which an enzyme acts.
- **Enzyme-Substrate Complex:** The temporary complex formed when an enzyme binds to its substrate.
- **Factors Affecting Enzyme Activity:** Temperature, pH, and substrate concentration can all influence the rate of enzyme-catalyzed reactions.

Understanding pH and Temperature

The function of biological molecules is often influenced by environmental conditions such as pH and temperature. Here, we'll discuss how these factors impact biological processes.

The Role of pH