

MCAT Handout: 50 Must-Know Mnemonics

High-Yield Memory Tricks for the MCAT



Introduction to Mnemonics

Mnemonics are powerful memory tools that help you rapidly recall complex information under the pressure of test conditions. For the MCAT, which spans biology, biochemistry, chemistry, physics, psychology, and sociology, the volume of material can feel overwhelming.

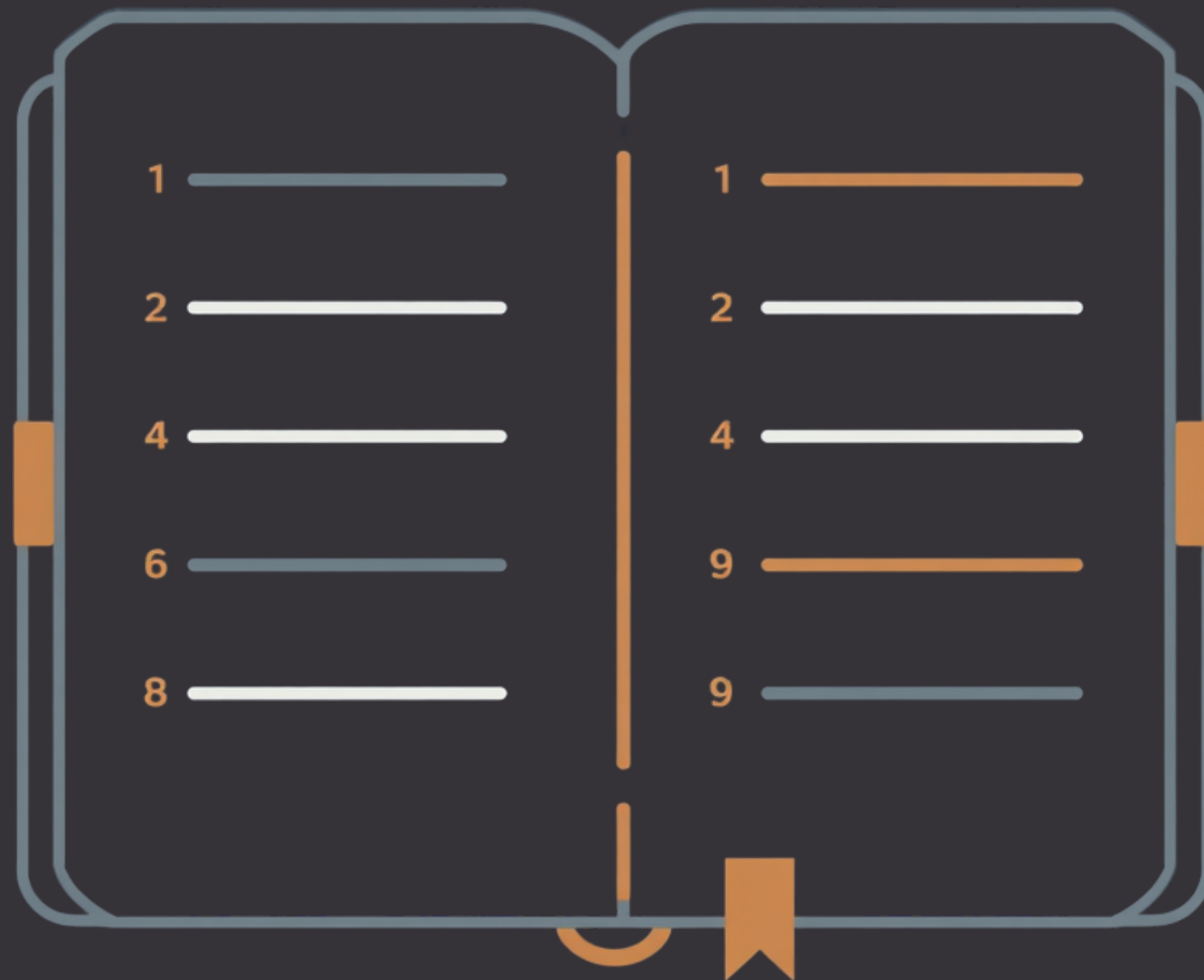
Mnemonics work by linking unfamiliar information to familiar patterns, words, or phrases — making retrieval faster and more reliable.

However, they supplement, not replace, deep conceptual understanding. Use them as shortcuts to access knowledge you have already internalized.

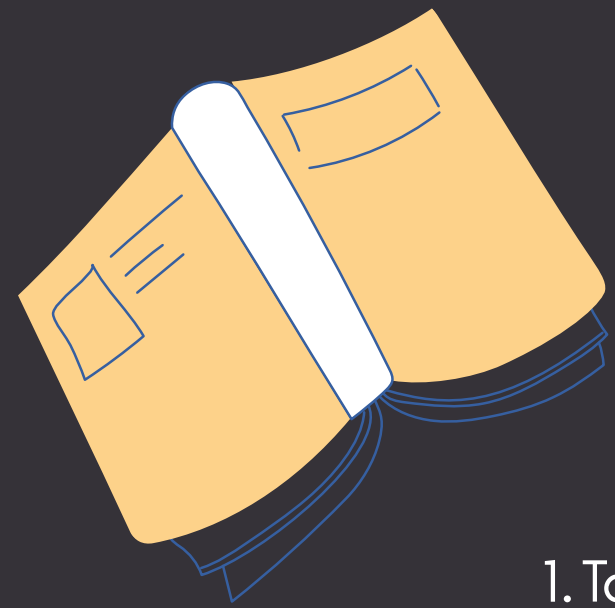
This handout covers mnemonics across all major MCAT subjects to give you a high-yield memory advantage on test day.



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Biology Mnemonics (Part 1)

1. Taxonomic Classification: "King Philip Came Over For Good Soup"
2. → Kingdom, Phylum, Class, Order, Family, Genus, Species
3. Cranial Nerves (I-XII): "On Old Olympus' Towering Tops, A Finn And German Viewed Some Hops"
4. → Olfactory, Optic, Oculomotor, Trochlear, Trigeminal, Abducens, Facial, Auditory, Glossopharyngeal, Vagus, Spinal Accessory, Hypoglossal
5. Cranial Nerve Function: "Some Say Marry Money, But My Brother Says Big Brains Matter More"
6. → Sensory (S), Motor (M), or Both (B) — follows cranial nerve order
7. Cell Cycle Stages: "IPMAT"
8. → Interphase, Prophase, Metaphase, Anaphase, Telophase
9. Mitosis Order: "PMAT"
10. → Prophase, Metaphase, Anaphase, Telophase



Biology Mnemonics

(Part 2)

Biological Classification: "Dumb King Philip Came Over For Good Soup" (Domain, Kingdom, Phylum, Class, Order, Family, Genus, Species)

Cardiac Blood Flow: "Try Pulling My Aorta" (Tricuspid, Pulmonary, Mitral, Aortic valves — order of blood flow through heart valves)

Layers of Skin: "Come, Let's Get Sun Burned" (Corneum, Lucidum, Granulosum, Spinosum, Basale — epidermis layers from outside in)

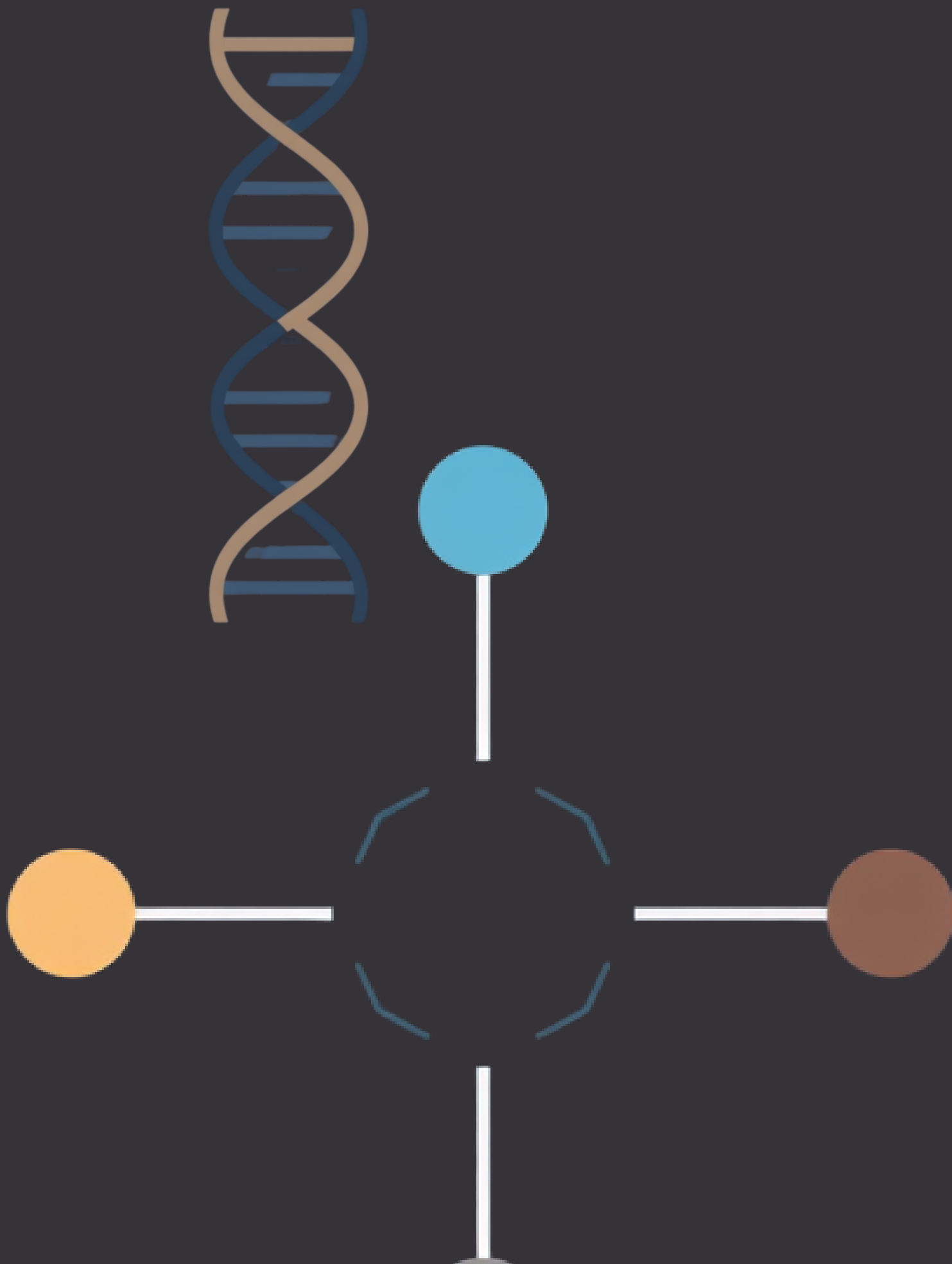
Brain Lobes: "F-POT" (Frontal, Parietal, Occipital, Temporal)

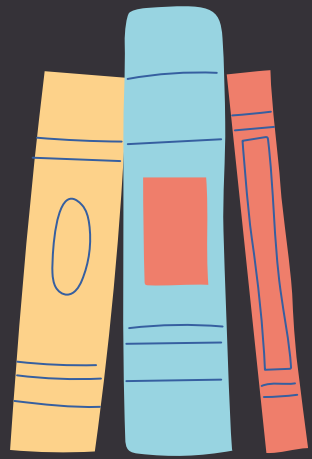
Immune Response: "B Before T" (B cells mature in Bone marrow; T cells mature in Thymus)



Biochemistry Mnemonics (Part 1)

- Essential Amino Acids: "PVT TIM HALL" — Phenylalanine, Valine, Threonine, Tryptophan, Isoleucine, Methionine, Histidine, Arginine, Leucine, Lysine
- Ketogenic Amino Acids: "Leucine and Lysine Are Lost" — Only Leucine and Lysine are purely ketogenic (cannot form glucose)
- Glycolysis Products: "ATP ATP NADH" — Net yield is 2 ATP and 2 NADH per glucose molecule
- Purines: "Pure As Gold" — Purines = Adenine and Guanine (two-ring structures)
- Pyrimidines: "CUT the PY" — Cytosine, Uracil, Thymine are pyrimidines (single-ring structures)





Biochemistry Mnemonics (Part 2)

- Electron Transport Chain: "NADH Starts at One" — NADH feeds electrons into Complex I (the first complex), while FADH₂ enters at Complex II, helping remember where each electron carrier enters the chain.
- DNA Structure: "AT, GC" — Adenine pairs with Thymine (2 H-bonds); Guanine pairs with Cytosine (3 H-bonds). Simple pairing rule for nucleotide base pairs.
- Histones: "H2A, H2B, H3, H4" — The four core histone proteins that form the nucleosome octamer (two copies each). H1 is the linker histone.
- Metabolism State: "Fed = Store" — In the fed (postprandial) state, insulin is high and the body stores energy as glycogen and fat. Fasting = break down.
- Glucagon: "Glucagon Gets Glucose Going" — Glucagon stimulates glycogenolysis and gluconeogenesis to raise blood glucose levels during fasting.



General Chemistry Mnemonics (Part 1)

- Diatomic Elements: "Have No Fear Of Ice Cold Beer" (H, N, F, O, I, Cl, Br)
- Strong Acids: "So I Brought No Clean Clothes" (H_2SO_4 , HI, HBr, HNO_3 , HClO_4 , HCl)
- Strong Bases: "CaSrBa" ($\text{Ca}(\text{OH})_2$, $\text{Sr}(\text{OH})_2$, $\text{Ba}(\text{OH})_2$ — plus Group 1 hydroxides)
- Oxidation vs Reduction: "OIL RIG" (Oxidation Is Loss, Reduction Is Gain)
- Oxidizing Agent: "LEO the Lion Says GER" (Loses Electrons = Oxidized; Gains Electrons = Reduced)

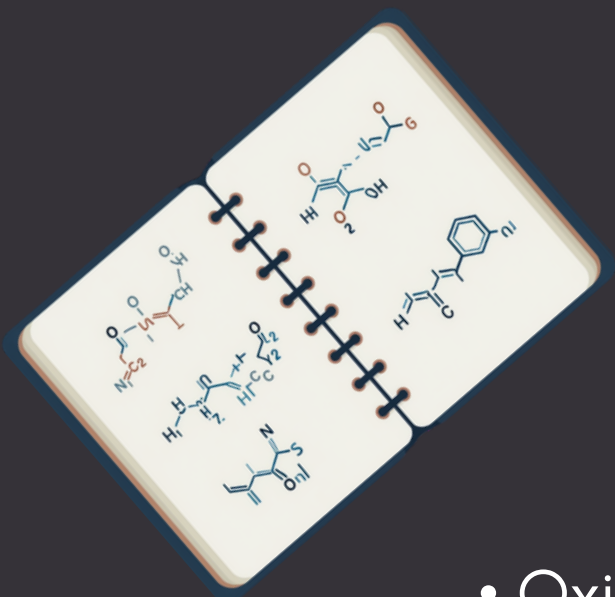




General Chemistry

Mnemonics (Part 2)

- EM Spectrum: "Raging Martians Invaded Venus Using X-Ray Guns" (Radio, Microwave, Infrared, Visible, Ultraviolet, X-Ray, Gamma)
- Increasing Energy: "Remember UV X-Rays Glow" (Radio → UV → X-Ray → Gamma = increasing energy)
- pH Scale: "Low pH = Lots of H+" (acidic solutions have high hydrogen ion concentration)
- Periodic Trends: "FONCIBrISCH" (electronegativity order for common nonmetals)
- Ideal Gas Law: "PIVNERT" ($PV = nRT$ — Pressure, Volume, n moles, R constant, Temperature)



Organic Chemistry Mnemonics (Part 1)

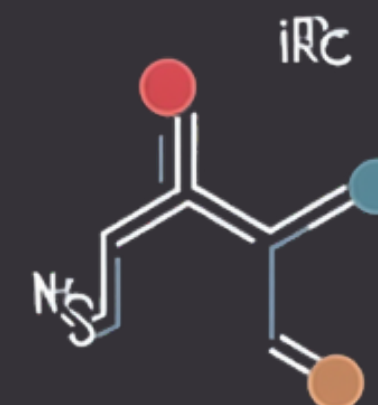
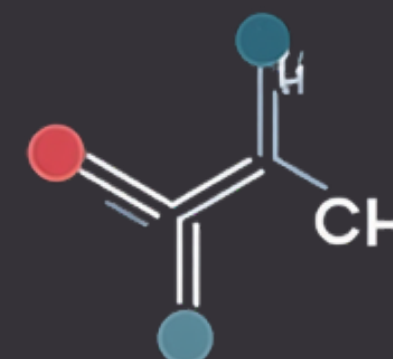
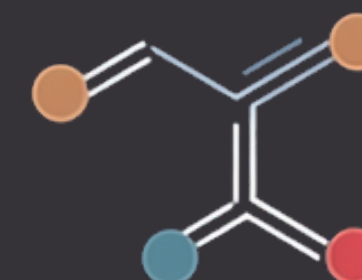
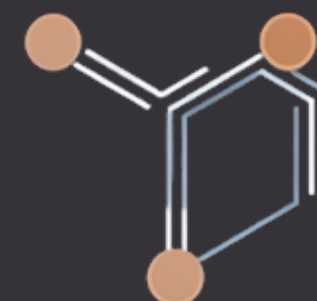
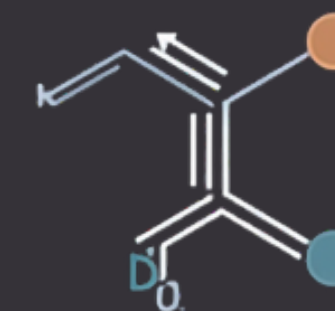
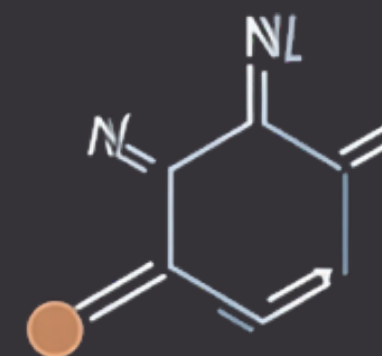
- Oxidation of Alcohols: "Primary Goes Farther" — Primary alcohols can be oxidized to aldehydes and then to carboxylic acids; secondary alcohols stop at ketones; tertiary alcohols resist oxidation.
- Carbonyl Compounds: "Aldehydes Are At the End" — Aldehydes have their carbonyl group at the terminal (end) carbon, while ketones have it in the middle.
- SN1 Reactions: "1 Carbocation" — SN1 proceeds in one step via a carbocation intermediate; favored by tertiary substrates and polar protic solvents.
- SN2 Reactions: "2 Things at Once" — SN2 is a concerted, one-step mechanism where the nucleophile attacks as the leaving group departs simultaneously; favored by primary substrates.
- E1 Reactions: "Eliminate After Carbocation" — E1 elimination first forms a carbocation intermediate, then a base removes a proton to form the alkene; shares conditions with SN1.



Organic Chemistry

Mnemonics (Part 2)

- Aromatic Compounds: "Benzene Loves Stability" — Aromatic rings are unusually stable due to delocalized π electrons; if it's cyclic, planar, fully conjugated, and follows Hückel's rule ($4n+2$ π electrons), it's aromatic.
- Priority Rules (R/S): "Higher Atomic Number Wins" — In CIP priority rules, assign priorities based on atomic number; higher atomic number = higher priority. Break ties by moving to the next atom.
- Enantiomers: "Mirror Images" — Enantiomers are non-superimposable mirror images of each other; they have the same connectivity but opposite configurations at all stereocenters.
- Fischer Projection: "Horizontal Comes Forward" — In a Fischer projection, horizontal bonds point toward the viewer (out of the page), while vertical bonds point away from the viewer.
- Carboxylic Acids: "Most Oxidized Organic Functional Group" — Carboxylic acids ($-\text{COOH}$) represent the highest oxidation state for carbon in common organic functional groups; they sit at the top of the oxidation hierarchy.





Physics Mnemonics (Part 1)

- Ohm's Law: "VIR" — $V = IR$ (Voltage = Current $\times$ Resistance)
- Newton's Second Law: "F = MA" — Force = Mass $\times$ Acceleration
- Power: "PIV" — $P = IV$ (Power = Current $\times$ Voltage)
- Mechanical Energy: "K + U" — Kinetic + Potential Energy (total mechanical energy)
- Wave Speed: " $V = F\lambda$ " — Speed = Frequency $\times$ Wavelength



Physics Mnemonics (Part 2)

Lens Equation — "One Over F": $1/f = 1/d_o + 1/d_i$. Remember "One Over F" to recall the thin lens equation structure quickly.

Momentum — " $P = MV$ ": Momentum equals mass times velocity. " $P = MV$ " — just say it like a word: "P-M-V."

Density — "DMV": $D = M/V$. Think of the Department of Motor Vehicles — DMV — to recall Density = Mass / Volume.

Work — "WFD": $W = Fd$. "Work = Force times Distance" — WFD keeps it simple and direct.

Pressure — " F/A ": Pressure = Force divided by Area. "F over A" — force on top, area on the bottom, just like the fraction.



Psychology & Sociology Mnemonics

- Freud's Personality Structure: "IDEGO" – Id, Ego, Superego
- Maslow's Hierarchy: "Please Stop Loving Tiny Silly People"
– Physiological, Safety, Love, Esteem, Self-Actualization
- Piaget's Stages: "Some People Can Fly" – Sensorimotor, Preoperational, Concrete, Formal
- Erikson's Stages: Trust → Autonomy → Initiative → Industry → Identity → Intimacy → Generativity → Integrity
- Social Influence: "Normative = Fit In, Informational = Be Correct"



Quick Review Sheet (Part 1)

Biology:

- ✓ PMAT - Mitosis stages
- ✓ Cranial Nerves - "On Old Olympus' Towering Tops..."
- ✓ Skin Layers - "Come, Let's Get Sun Burned"
- ✓ Taxonomy - "King Philip Came Over For Good Soup"
- ✓ Blood Flow - "Try Pulling My Aorta"

Biochemistry:

- ✓ PVT TIM HALL - Essential amino acids
- ✓ CUT the PY - Pyrimidines
- ✓ Pure As Gold - Purines
- ✓ Glycolysis Products - ATP ATP NADH
- ✓ Glucagon Gets Glucose Going

Chemistry:

- ✓ OIL RIG - Oxidation/Reduction
- ✓ Strong Acids - "So I Brought No Clean Clothes"
- ✓ Diatomic Elements - "Have No Fear Of Ice Cold Beer"
- ✓ EM Spectrum - "Raging Martians Invaded Venus..."
- ✓ Ideal Gas Law - PIVNERT





Quick Review Sheet (Part 2)

Organic Chemistry

- ✓ SN1 = Carbocation (tertiary substrate, polar protic solvent)
- ✓ SN2 = One Step (backside attack, inversion of configuration)
- ✓ Primary Goes Farther (primary alcohols oxidize to aldehydes, then carboxylic acids)
- ✓ Fischer Projections: Horizontal Comes Forward
- ✓ Aromatic Stability: Benzene Loves Stability (Hückel's rule: $4n+2$ π electrons)

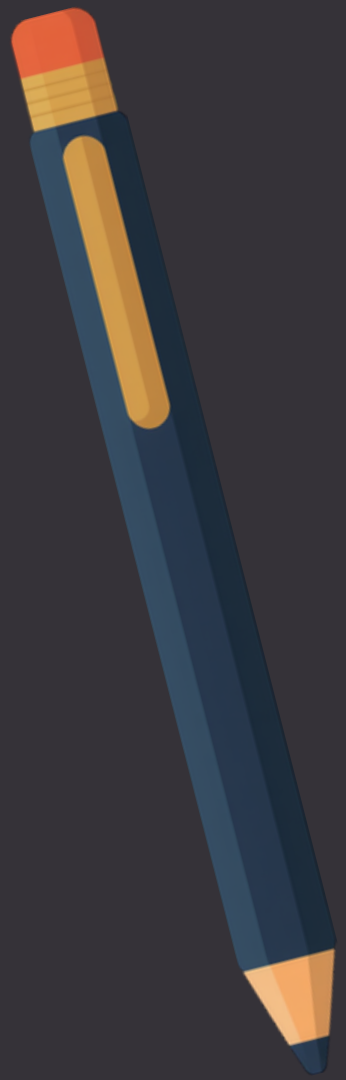
Physics

- ✓ VIR — Ohm's Law: $V = IR$
- ✓ PIV — Power: $P = IV$
- ✓ DMV — Density: $D = M/V$
- ✓ WFD — Work: $W = Fd$
- ✓ $F = MA$ — Newton's Second Law

Psychology & Sociology

- ✓ IDEGO — Freud's Id, Ego, Superego
- ✓ Maslow: Please Stop Loving Tiny Silly People (Physiological, Safety, Love, Esteem, Self-actualization)
- ✓ Piaget: Some People Can Fly (Sensorimotor, Preoperational, Concrete, Formal)
- ✓ Erikson: Trust, Autonomy, Initiative, Industry, Identity...
- ✓ Social Influence: Normative = Fit In, Informational = Be Correct





Exam-Day Advice (Part 1)

1. Learn the Concept First
2. Before relying on a mnemonic, make sure you understand why the information matters. Mnemonics are most powerful when anchored to real conceptual understanding.
3. Use Mnemonics for Recall
4. During the exam, mnemonics help you retrieve complex information quickly and accurately under pressure — saving valuable time on test day.
5. Practice Retrieval
6. Regularly test yourself without looking at your notes. Active recall strengthens memory pathways and makes mnemonics more reliable when it counts most.



Exam-Day Advice (Part 2)

Connect Information: The MCAT emphasizes application over memorization alone. Link mnemonics to underlying concepts so you can apply knowledge to novel questions. When you understand the "why" behind a fact, your mnemonic becomes a gateway to deeper reasoning rather than just rote recall.

Review Frequently: Spaced repetition is one of the most evidence-based strategies for long-term retention. Revisit your mnemonics at increasing intervals — after 1 day, 3 days, 1 week, and 2 weeks. Consistent, distributed review dramatically outperforms last-minute cramming and ensures high-yield information stays accessible on test day.





Key Takeaways (Part 1)

High-Yield Info Appears Repeatedly: Many MCAT concepts are tested every year. Prioritize mastering these recurring topics to maximize your score.

Faster Recall Improves Performance: When you can retrieve information quickly using mnemonics, you save valuable time during the exam — time you can use to reason through harder questions.

Active Recall Is Essential: Don't just re-read your mnemonics. Practice recalling them from memory regularly. Testing yourself without notes strengthens retention far more than passive review.



Key Takeaways

Understanding Still Matters Most

Mnemonics are powerful recall tools, but they work best when paired with genuine conceptual understanding. The MCAT tests your ability to apply knowledge, not just recite it. Always learn the "why" behind each concept — mnemonics simply help you retrieve what you already understand under pressure.

Consistency Wins

Repeated review of high-yield facts beats cramming new information at the last minute. Spaced repetition — revisiting mnemonics regularly over days and weeks — builds long-term retention.

Dedicate a few minutes each day to reviewing your mnemonics, and they will be second nature by test day.



Master Your Mnemonics for MCAT Success

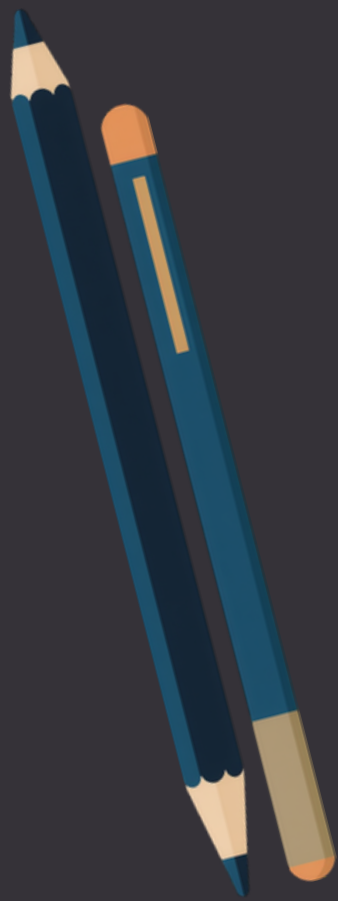
You now have 50 must-know mnemonics to power your MCAT preparation. Master these memory tools and combine them with strong content review and targeted practice questions. Understanding the "why" behind each concept — paired with rapid mnemonic recall — gives you a powerful advantage on test day. Consistency and active retrieval are your greatest allies. Review frequently, practice under timed conditions, and trust the process. You are ready to succeed!



Branding Template

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- Header placement: Top-left or top-right corner for subtle branding
- Footer placement: Bottom-left or bottom-right for unobtrusive presence
- Recommended size: Small enough not to distract, visible enough to reinforce brand identity
- Apply this template to all slides after the cover for a cohesive, professional look
- Consistent branding builds credibility and recognition throughout your MCAT handout



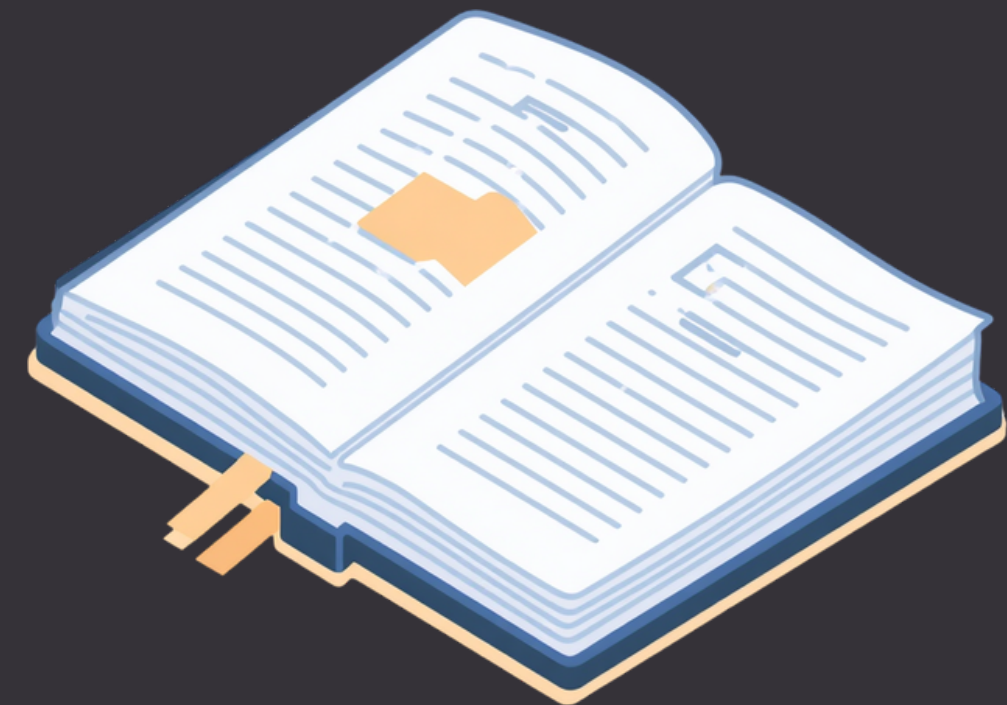
Appendix / Additional Resources

Recommended Study Aids & Websites:

- Khan Academy MCAT (khanacademy.org/test-prep/mcat) – Free, comprehensive video lessons
- AAMC Official Prep – Gold standard practice exams and question banks
- Anki – Spaced repetition flashcard app; ideal for mnemonic reinforcement
- Princeton Review / Kaplan MCAT Books – Structured content review
- Sketchy Medical – Visual mnemonic videos for biology and biochemistry

Integration Tips:

- Pair each mnemonic with a practice question to reinforce conceptual understanding
- Use Anki decks to schedule daily mnemonic review sessions
- Combine mnemonics with active recall: cover your notes and recite from memory
- Revisit this handout weekly during your dedicated MCAT study period





Thank you!

Questions & Discussion Welcome

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