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UP LT Grade Science Formula & Concept

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LT Grade Science Formula & Concept Cheat Sheet (Quick Revision)

PHYSICS: Key Formulas & Laws

Motion & Mechanics

- $v = u + at$ $v = u + at$ — Final velocity (v), initial velocity (u), acceleration (a), time (t)
- $s = ut + \frac{1}{2}at^2$ $s = ut + \frac{1}{2}at^2$ — Displacement (s)
- Newton's Second Law: $F = ma$ $F = ma$
- Work: $W = F \cdot d \cdot \cos\theta$ $W = F \cdot d \cdot \cos\theta$
- Power: $P = \frac{W}{t}$ $P = \frac{W}{t}$
- Kinetic Energy: $KE = \frac{1}{2}mv^2$ $KE = \frac{1}{2}mv^2$
- Potential Energy: $PE = mgh$ $PE = mgh$

Heat & Thermodynamics

- Heat: $Q = mc\Delta T$ $Q = mc\Delta T$
- First law of thermodynamics: $\Delta U = Q - W$ $\Delta U = Q - W$

Light & Optics

- Refractive Index: $n = \frac{\text{Speed of light in vacuum}}{\text{Speed of light in medium}}$ $n = \frac{\text{Speed of light in vacuum}}{\text{Speed of light in medium}}$
- Lens Formula: $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

Electricity

- Ohm's Law: $V = IR$ $V = IR$
 - Power: $P = VI$ $P = VI$
-



CHEMISTRY: Must-Know Concepts & Equations



Mole Concept & Stoichiometry

- No. of moles: $n = \frac{\text{given mass}}{\text{molar mass}}$
 $n = \frac{\text{given mass}}{\text{molar mass}}$
- Avogadro's Number: 6.022×10^{23}



Gas Laws

- Boyle's Law: $P \propto \frac{1}{V}$ (T constant)
- Charles' Law: $V \propto T$ (P constant)
- Ideal Gas: $PV = nRT$



Acids, Bases, Salts

- $\text{pH} = -\log[\text{H}^+]$



Chemical Reactions

- Balancing equations is key — practice combustion, combination, and displacement types.



Periodic Table Trends

- Across a period: Atomic radius ↓, Ionization energy ↑
- Down a group: Atomic radius ↑, Ionization energy ↓



BIOLOGY: Critical Diagrams & Points



Cell

- Plant cells have cell wall + chloroplasts, animal cells don't
- Nucleus = control center
- Mitochondria = powerhouse

✓ Photosynthesis

- $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

✓ Respiration

- Aerobic: Glucose + O₂ → CO₂ + H₂O + Energy

✓ Human Body Highlights

- Blood: RBCs carry O₂, WBCs fight infection, Platelets clot
- Heart flow: RA → RV → Lungs → LA → LV → Body
- Nervous system: CNS = brain + spinal cord

✓ Ecology

- Food chain: Producer → Primary consumer → Secondary consumer

📌 Pro Tip:

Focus on numerical applications in Physics, trends and reasoning in Chemistry, and diagram-based / process-based questions in Biology.

👉 How to Use This Cheat Sheet

💡 Print it or keep it on your device for quick revision in the last week before your exam. Combine with practice papers for max impact!