

Grade 12 Physical Sciences: Exam Preparation & Tips Guide

Grade 12 | Physical Sciences | Study Guide | 2024

Free Study Resources for South African Matric Learners

1. Paper 1 (Physics) Key Topics Summary

- Mechanics: Newton's laws, projectile motion, momentum and impulse, work-energy theorem
- Waves: Doppler effect, electromagnetic spectrum, sound waves
- Electricity & Magnetism: circuits (series/parallel), Ohm's law, motors and generators
- Electrostatics: Coulomb's law, electric fields, capacitors
- Photoelectric effect: $E = hf$; work function; quantum of energy

2. Paper 2 (Chemistry) Key Topics Summary

- Matter and materials: bonding, intermolecular forces, physical properties
- Chemical change: energy changes, rates of reaction, chemical equilibrium
- Electrochemistry: galvanic and electrolytic cells, half-reactions, EMF
- Organic chemistry: IUPAC naming, reactions (addition, substitution, elimination, esterification)
- Industrial chemistry: Haber process (ammonia), Contact process (sulfuric acid), Chlor-alkali process

3. Common Exam Mistakes to Avoid

- Not showing units in answers; always include units at every step
- Using incorrect formula; write the formula, then substitute values
- Sign errors in Newton's law problems; choose positive direction FIRST and state it
- Forgetting to convert units (m/s vs km/h; kJ vs J; cm vs m)
- Not reading the question carefully; look for "magnitude", "direction", "net force"
- In equilibrium questions, not identifying all forces acting on an object
- In circuit questions, confusing voltage, current, and resistance in parallel vs series

4. Answering Strategy

- Read through whole paper first; start with questions you know well
- Show all working; partial marks are awarded for method even if answer wrong
- Draw diagrams for force problems; label all forces with arrows
- For calculations: write known values, state formula, substitute, calculate, check units
- For multiple choice: eliminate wrong answers; check each option carefully
- In definitions: use exact wording from CAPS curriculum when possible

Momentum: $p = mv$

Impulse: $\text{Impulse} = F \cdot \Delta t = \Delta p$

Kinetic energy: $KE = \frac{1}{2} mv^2$

Work-Energy theorem: $\text{Net work} = \Delta KE = KE_{\text{final}} - KE_{\text{initial}}$

Coulombs law: $F = k \frac{Q_1 Q_2}{r^2}$

Ohm's law: $V = IR$

TIP The Data Sheet is provided in the exam. Know where to find each formula so you don't waste time. Practise using it on past papers so it becomes second nature.