SYLLABUS · SCIENCES · WASSCE 2026

Physics syllabus

Every examinable topic area in WAEC Physics, in one place — with how the papers are structured and answers to common questions. Compiled by waeccbt.com; not an official WAEC document.

How the papers work: Paper 1 — 50 multiple-choice objective questions · 1 hour 15 minutes · 50 marks. Taken at the same sitting as Paper 2. Paper 2 — two sections · 1 hour 30 minutes · 60 marks. Section A: 7 short-structured questions, answer any 5 for 15 marks. Section B: 5 essay questions, answer any 3 for 45 marks. Paper 3 — practical test (school candidates) or alternative-to-practical (private candidates) · 2 hours 45 minutes · 50 marks. Three questions, answer any two. All questions are set in SI units — answers given without units, or with wrong units, lose marks in the theory and practical papers.

1. Interaction of matter, space and time

- Concepts of matter; kinetic theory; crystalline vs amorphous substances
- Fundamental and derived quantities and units; dimensional analysis
- Position, distance and displacement; use of vernier calipers and micrometer screw gauge
- Mass and weight; time and its measurement
- Fluids at rest: density, relative density, pressure, Pascal's principle, barometers; Archimedes' principle and flotation
- Motion: types, relative motion, force, friction (static and dynamic, coefficients), viscosity and terminal velocity, circular motion
- Speed, velocity and rectilinear acceleration; distance–time and velocity–time graphs; equations of motion; motion under gravity
- Projectiles: range, maximum height, time of flight
- Scalars and vectors; resolution and resultants
- Equilibrium of forces: moments, couples, centre of gravity, stability
- Simple harmonic motion: period, frequency, amplitude, energy; forced vibration and resonance
- Newton's laws of motion; momentum, impulse and conservation; recoil, jet and rocket propulsion

2. Energy: mechanical and heat

- Forms of energy; renewable and non-renewable world energy resources; conservation of energy
- Work, energy and power; potential and kinetic energy; machines (MA, VR, efficiency)
- Elastic properties of solids: Hooke's law, Young's modulus, work done in springs
- Temperature and thermometers; Celsius and Kelvin scales
- Expansion of solids and liquids; anomalous expansion of water
- Heat transfer: conduction, convection, radiation; the vacuum flask; solar collectors and black-body radiation
- Gas laws: Boyle's, Charles', pressure law and the general gas equation
- Heat capacity and specific heat capacity; method of mixtures and electrical method
- Latent heat: fusion and vaporisation; melting and boiling points; effects of impurities and pressure
- Evaporation, boiling, vapour pressure; humidity, relative humidity, dew point and the weather

3. Waves

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- Production and propagation of mechanical waves; ripple tank; wave equation $v = f\lambda$
- Transverse and longitudinal waves; $y = A \sin(\omega t \pm 2\pi x/\lambda)$
- Properties of waves: reflection, refraction, diffraction, interference, stationary waves
- Light: sources, rectilinear propagation, shadows, eclipses, pinhole camera
- Reflection at plane and curved mirrors; mirror formula and magnification
- Refraction at plane and curved surfaces; critical angle and total internal reflection; lens formula; optical instruments; defects of the eye and corrections
- Dispersion of white light; colours of objects; mixing coloured lights
- Electromagnetic spectrum: radio to gamma rays and their uses
- Fibre optics and LASERs: principles, applications and dangers
- Sound: transmission, speed in solids/liquids/air, echoes and reverberation, characteristics of sound
- Vibrations in strings and pipes; sonometer; resonance; harmonics and overtones

4. Fields

- Gravitational field: g, Newton's law of gravitation, potential and escape velocity; satellites and parking orbits
- Electrostatics: production, distribution and storage of charges; Coulomb's law; field intensity and potential
- Capacitance: parallel-plate factors, series and parallel combinations, stored energy
- Current electricity: cells and accumulators, e.m.f., Ohm's law, resistivity, series/parallel circuits, internal resistance, shunts and multipliers, measurement bridges
- Electrical energy and power; household wiring and the kWh
- Magnetic fields: magnets, magnetisation, flux and flux density, earth's field, force on moving charges ($F = qvB \sin\theta$), Fleming's left-hand rule
- Electromagnetic induction: Faraday's and Lenz's laws, generators, transformers, inductance, eddy currents, power transmission
- Simple a.c. circuits: peak and r.m.s. values, reactance, impedance, resonance and power

5. Atomic and nuclear physics; electronics

- Models of the atom: Thomson, Rutherford, Bohr, electron-cloud; energy quantisation and line spectra
- Photoelectric effect and Einstein's equation; thermionic emission; X-rays: production, properties, uses, hazards
- Structure of the nucleus; isotopes; radioactivity (α, β, γ), half-life and decay constant; applications and hazards
- Fission and fusion; binding energy, mass defect, $E = \Delta mc^2$; nuclear reactors
- Wave–particle duality; electron diffraction
- Conductors, semiconductors and insulators; band theory; doping, p-n junction diodes and rectification

Frequently asked questions

How many papers are in WAEC Physics?

Three. Paper 1 (50 objectives, 1 hour 15 minutes, 50 marks) and Paper 2 (theory, 1 hour 30 minutes, 60 marks) are taken at one sitting; Paper 3 is the practical, 2 hours 45 minutes for 50 marks.

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How is Physics Paper 2 structured?

Section A has 7 short-structured questions and you answer any 5 for 15 marks. Section B has 5 essay questions and you answer any 3 for 45 marks.

What happens in the Physics practical paper?

You answer 2 of 3 experiment questions in 2 hours 45 minutes for 50 marks. Private candidates sit an alternative-to-practical paper instead. Tables, graphs, units and precautions all carry marks.

Are formulas given in the WAEC Physics exam?

No. The question paper does not include a formula sheet, so the standard relations — equations of motion, lens and mirror formulas, $V = IR$, $Q = mc\Delta\theta$ and the rest — must be memorised. Questions are set in SI units.

What topics come up most in WAEC Physics?

Mechanics (motion, forces, energy), heat, waves and optics, and current electricity dominate the paper, with atomic and nuclear physics and electronics closing the syllabus. The objectives sample everything.

Do I need Mathematics to pass Physics?

You need comfortable algebra, graph work and unit handling — a large share of the marks are calculations. If your maths is solid, physics calculations become free marks.

Is Physics compulsory in WASSCE?

No, but it is required for engineering, medicine-related and physical science courses, and it must usually be passed alongside Mathematics and Chemistry for those routes.

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