GCSE PHYSICS

GCSE2MED: PHYSICS SPEC CHECK ☑

Tick things off as you learn them. Based on AQA (8463) — Edexcel & OCR differences flagged where they exist.

My exam details

Board: _____ Tier: _____ Course: _____

Exam date: _____ Target grade: _____

How to use this

Each topic has three columns, not one — because "I've seen it" and "I could answer an exam question on it" are very different things:

Covered — you've been taught it or read through it. **Test** — you've actually tested yourself on it with exam questions or past paper questions, not just notes.

Review — this is where you do RAG (Red, Amber, Green) rating. Colour the circle red if you're not confident, amber if you're getting there, or green if you could teach it — based on how you actually performed on exam questions, not just how it felt reading it.

Use the Board/Tier box above to filter what applies to you — skip anything tagged for a different tier or course. If you get to the end of a topic and most circles are red or amber, that's your revision priority, not the topics already green.

If a topic doesn't make sense: try a revision website (BBC Bitesize, Save My Exams, Seneca) or a YouTube GCSE Physics creator first — they're written specifically for this level, often walk through past exam questions, and are a good first stop before turning to AI.

Using AI to help you understand a topic: if a topic name on this checklist means nothing to you, type it into an AI chat and ask it to explain it — that's a genuinely good use of it. But keep it at GCSE level: you only need to know what's on the specification, not the full A-level or university explanation underneath it. Don't let it write your notes for you, and don't lean on it to answer every practice question — it won't be sitting next to you in the exam. Use it to understand, then close the chat and prove to yourself you can do it without it.

What the tags mean

[HT] — Higher tier only. Skip this if you're sitting Foundation.

[Physics only] — Separate Physics only, on all three boards. Skip this if you're doing Combined Science.

[AQA & OCR only] — Separate Physics only on AQA and OCR — but this IS Combined Science content on Edexcel. Check your board carefully.

[AQA only] — Separate Physics only on AQA specifically. Combined on Edexcel and OCR.

Edexcel — Extra content specific to the Edexcel exam board.

RP — A required practical. These come up often as "describe how you would..." questions — know the method, not just the result.

No tag = examined on all three boards, both tiers, both Combined Science and separate Physics.

1. Energy · *Paper 1*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Energy stores — kinetic, gravitational potential, elastic potential, chemical, thermal, and others	☐	☐	○
Energy transfers and pathway diagrams	☐	☐	○
Kinetic energy, KE = ½mv²	☐	☐	○
Gravitational potential energy, GPE = mgh	☐	☐	○

Topic	Covered	Test	Review
Elastic potential energy, $E = \frac{1}{2}ke^2$ (within the limit of proportionality)	☐	☐	○
Conservation of energy — energy is transferred, stored, or dissipated, never created or destroyed	☐	☐	○
Energy dissipation — "wasted" energy spreading out, usually heating the surroundings	☐	☐	○
Specific heat capacity, $\Delta E = mc\Delta\theta$ RP	☐	☐	○
Power, $P = E \div t$ and $P = W \div t$	☐	☐	○
Efficiency as a fraction or percentage (useful output ÷ total input)	☐	☐	○
Efficiency using power (useful power out ÷ total power in) [HT]	☐	☐	○
Reducing unwanted energy transfer — lubrication and thermal insulation RP [AQA only]	☐	☐	○
Rate of cooling and the effect of wall thickness / thermal conductivity	☐	☐	○
Renewable and non-renewable energy resources, named examples	☐	☐	○
Trends in energy resource use, and environmental/reliability issues	☐	☐	○

2. Electricity · *Paper 1*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Current, charge and time, $Q = It$	☐	☐	○
Potential difference (voltage) and energy, $W = QV$	☐	☐	○
Resistance, $V = IR$	☐	☐	○
Circuit symbols — cell, battery, switch, lamp, ammeter, voltmeter, resistor, variable resistor, diode, LDR, thermistor, fuse	☐	☐	○
Series circuits — current and p.d. rules	☐	☐	○
Parallel circuits — current and p.d. rules	☐	☐	○
I–V characteristics of a resistor, a filament lamp, and a diode RP	☐	☐	○
Thermistors and LDRs — how resistance changes with temperature/light	☐	☐	○
Direct current (dc) vs alternating current (ac)	☐	☐	○
UK mains supply — about 230 V, 50 Hz	☐	☐	○
Three-core cable — live, neutral and earth wires (colours and roles)	☐	☐	○
Fuses, and earthing a metal casing	☐	☐	○
Electrical power, $P = VI$ and $P = I^2R$	☐	☐	○
Energy transferred, $E = Pt$ and $E = QV$	☐	☐	○
The National Grid — why electricity is transmitted at high voltage	☐	☐	○
Transformers (basic idea) — step-up and step-down [AQA & OCR only]	☐	☐	○

Topic	Covered	Test	Review
Static electricity — charging by friction, electron transfer	☐	☐	○
Attraction and repulsion between charged objects	☐	☐	○
Electric fields around a charged object **[Physics only]**	☐	☐	○
Uses and dangers of static electricity (examples vary by board)	☐	☐	○

3. Particle Model of Matter · *Paper 1*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Density, ρ = m ÷ V RP	☐	☐	○
Particle arrangement in solids, liquids and gases	☐	☐	○
Changes of state — melting, freezing, boiling, condensing, sublimating	☐	☐	○
Internal energy — the energy stored by a system's particles	☐	☐	○
Specific heat capacity, ΔE = mcΔθ, applied to particle theory	☐	☐	○
Specific latent heat, E = mL (fusion and vaporisation)	☐	☐	○
Heating and cooling graphs — interpreting the flat sections	☐	☐	○
Particle motion in gases — how temperature relates to speed and pressure	☐	☐	○
Gas pressure and volume, pV = constant **[Physics only]**	☐	☐	○
Work done on a gas increasing its temperature **[Physics only]** [HT]	☐	☐	○

4. Atomic Structure · *Paper 1*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Structure of the atom — nucleus, protons, neutrons, electrons, and scale	☐	☐	○
Mass number, atomic number, and isotopes	☐	☐	○
Development of the atomic model — from "solid sphere" to plum pudding to nuclear	☐	☐	○
The alpha scattering experiment as evidence for the nuclear model	☐	☐	○
Bohr's model and electron energy levels	☐	☐	○
Later discovery of protons and neutrons	☐	☐	○
Alpha, beta and gamma radiation — what they are, penetration, ionising power	☐	☐	○
Beta-plus (positron) decay — a proton becomes a neutron plus a positron Edexcel	☐	☐	○
Nuclear equations — balancing mass number and atomic number	☐	☐	○
Activity and count-rate, measured in becquerels	☐	☐	○

Topic	Covered	Test	Review
Half-life — definition and calculations	☐	☐	○
Half-life expressed as a ratio after several half-lives **[HT]**	☐	☐	○
Radioactive contamination vs irradiation	☐	☐	○
Sources of background radiation	☐	☐	○
Uses of radiation in medicine (imaging and treatment) **[Physics only]**	☐	☐	○
Nuclear fission — the process and chain reactions **[Physics only]**	☐	☐	○
Nuclear fusion **[Physics only]**	☐	☐	○

5. Forces · *Paper 2*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Scalar and vector quantities	☐	☐	○
Contact and non-contact forces	☐	☐	○
Weight, W = mg, and centre of mass	☐	☐	○
Resultant forces	☐	☐	○
Free body diagrams	☐	☐	○
Resolving a force into two components (scale drawings) **[HT]**	☐	☐	○
Work done, W = Fs, and the joule	☐	☐	○
Elastic and inelastic deformation	☐	☐	○
Hooke's law, F = ke RP	☐	☐	○
Elastic potential energy, E = ½ke²	☐	☐	○
Moments, M = F × d **[Physics only]**	☐	☐	○
The principle of moments (balanced clockwise/anticlockwise) **[Physics only]**	☐	☐	○
Levers as force multipliers or distance multipliers **[Physics only]**	☐	☐	○
Gears — turning force, speed and direction **[Physics only]**	☐	☐	○
Pressure in a fluid, p = F ÷ A **[AQA & OCR only]**	☐	☐	○
Pressure and depth in a liquid, p = hρg **[AQA & OCR only]** *(HT on AQA)*	☐	☐	○
Upthrust, floating and sinking **[AQA & OCR only]** *(HT on AQA)*	☐	☐	○
Atmospheric pressure, and why it varies with height **[AQA & OCR only]**	☐	☐	○
Distance and displacement	☐	☐	○
Speed and velocity, and typical values	☐	☐	○
Distance–time graphs — gradient as speed	☐	☐	○

Topic	Covered	Test	Review
Acceleration, a = Δv ÷ t	☐	☐	○
$v^2 - u^2 = 2as$	☐	☐	○
Velocity–time graphs — gradient as acceleration, area as distance *(area = HT)*	☐	☐	○
Terminal velocity	☐	☐	○
Newton's First Law, and the term "inertia" *("inertia" = HT)*	☐	☐	○
Newton's Second Law, F = ma RP	☐	☐	○
Inertial mass, F ÷ a [HT]	☐	☐	○
Newton's Third Law	☐	☐	○
Thinking distance, braking distance and stopping distance	☐	☐	○
Reaction time and factors affecting it	☐	☐	○
Factors affecting braking distance	☐	☐	○
Momentum, p = mv [HT]	☐	☐	○
Conservation of momentum [HT] *(calculations are physics only)*	☐	☐	○
Momentum and Newton's second law, F = Δp ÷ Δt [HT] **[Physics only]**	☐	☐	○
Safety features and momentum — airbags, seatbelts, crumple zones [HT] **[Physics only]**	☐	☐	○

6. Waves · *Paper 2*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Transverse and longitudinal waves	☐	☐	○
Amplitude, wavelength, frequency, and period	☐	☐	○
Wave speed, v = fλ RP	☐	☐	○
Waves changing medium — how speed and wavelength change, frequency doesn't **[AQA & OCR only]**	☐	☐	○
Reflection, transmission and absorption at boundaries **[AQA & OCR only]**	☐	☐	○
The electromagnetic spectrum — order and properties	☐	☐	○
Uses of electromagnetic waves	☐	☐	○
Hazards of electromagnetic waves	☐	☐	○
Refraction of light RP	☐	☐	○
Production and detection of radio waves by oscillating circuits [HT]	☐	☐	○
Converging and diverging lenses **[Physics only]**	☐	☐	○
Ray diagrams for lenses **[Physics only]**	☐	☐	○

Topic	Covered	Test	Review
Magnification calculations **[Physics only]**	☐	☐	○
Visible light, colour, and specular/diffuse reflection **[Physics only]**	☐	☐	○
Colour filters **[Physics only]**	☐	☐	○
Black body radiation — emission and absorption of infrared **[Physics only]**	☐	☐	○
Perfect black bodies **[Physics only]**	☐	☐	○
Intensity and wavelength of radiation vs temperature **[Physics only]**	☐	☐	○
The balance of absorbed and emitted radiation **[Physics only]** [HT]	☐	☐	○
Earth's temperature and the radiation balance **[Physics only]** [HT]	☐	☐	○

7. Magnetism and Electromagnetism · *Paper 2*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Poles of a magnet, attraction and repulsion	☐	☐	○
Permanent and induced magnets	☐	☐	○
Magnetic fields — shape, strength and direction	☐	☐	○
Plotting a magnetic field with a compass	☐	☐	○
Earth's magnetic field, and compass evidence for a magnetic core	☐	☐	○
The magnetic field around a current-carrying wire	☐	☐	○
Solenoids and electromagnets	☐	☐	○
The motor effect [HT]	☐	☐	○
Fleming's left-hand rule [HT]	☐	☐	○
F = BIl [HT]	☐	☐	○
Electric motors [HT]	☐	☐	○
Loudspeakers **[Physics only]** [HT]	☐	☐	○
The generator effect — induced potential [HT] *(physics only on AQA & OCR)*	☐	☐	○
Factors affecting the size and direction of induced potential [HT] *(physics only on AQA & OCR)*	☐	☐	○
Alternators and dynamos **[Physics only]** [HT]	☐	☐	○
Microphones **[Physics only]** [HT]	☐	☐	○
Transformers, $V_p \div V_s = n_p \div n_s$ **[AQA & OCR only]** [HT]	☐	☐	○
Transformers and power, $V_p I_p = V_s I_s$ **[AQA & OCR only]** [HT]	☐	☐	○

8. Space Physics · *Paper 2 · physics only — whole topic*

Last revisited: _____ *(update this whenever you go back over the whole topic)*

Topic	Covered	Test	Review
Our solar system — the Sun, planets, dwarf planets, and moons	☐	☐	○
Formation of a star from a nebula	☐	☐	○
The life cycle of a star about the size of the Sun	☐	☐	○
The life cycle of a star much more massive than the Sun	☐	☐	○
Elements formed by fusion, and elements formed in a supernova	☐	☐	○
Orbital motion — gravity providing the force for a circular orbit	☐	☐	○
Circular orbits — changing velocity at a constant speed **[HT]**	☐	☐	○
Orbital radius and speed for a stable orbit **[HT]**	☐	☐	○
Red-shift — what is observed, and why	☐	☐	○
Red-shift, an expanding universe, and the Big Bang	☐	☐	○
What isn't yet explained — dark matter and dark energy	☐	☐	○

My weakest topics

This page is for topics that **past papers** have exposed as weak — not just things you haven't got to yet. Ticking "Covered" in the checklist tells you what you've seen; getting a question wrong under exam conditions tells you what you actually don't know, and that's a more reliable signal.

Every time you mark a past paper, add anything you got wrong or were unsure of here, with the page number so you can find it fast. **Treat this list as your priority order for revision** — work down it before going back over topics you've already rated green in Review.

A note on accuracy: specifications get updated. Always check the live specification document for your exact board and tier alongside this checklist — treat this as a study companion, not a replacement for it.