

The ESAT specification, decoded

What is examinable, what is explicitly excluded, and the small corners strong students skip.

THE SHORT ANSWER

The official map is finite: Mathematics 1 plus the modules required by your course. Every science module and Mathematics 2 assumes Mathematics 1. Revise from the point IDs, not chapter names: “Physics” is too large to act on; “P6.2 refraction and Doppler” can be learned, tested and closed.

Checked against the sources named in this guide, August 2026. British English. Free to share.

1 How to read the map

Our machine-readable copy of the current official specification contains the following top-level point records. Many records contain several examinable sub-points, so the count is an index, not a difficulty score.

Module	Sections / points	Official section spine
Mathematics 1	7 / 76	Units; number; ratio; algebra; geometry; statistics; probability
Mathematics 2	8 / 39	Functions; series; coordinate geometry; trigonometry; logs; calculus; graphs
Physics	7 / 32	Electricity; magnetism; mechanics; thermal physics; matter; waves; radioactivity
Chemistry	17 / 89	Atomic structure through air and water, including quantitative, redox, bonding, rates and organic
Biology	11 / 34	Cells through plant physiology, including inheritance, gene technologies and ecosystems

The safe revision loop is point → retrieval → application → timed mix. Highlighting a chapter proves only that your highlighter works.

1 The tell

If your checklist says “done: waves”, it hides five different jobs: properties (P6.1), reflection/refraction and Doppler (P6.2), ray diagrams (P6.3), sound (P6.4), and the electromagnetic spectrum (P6.5). Keep the official IDs beside your notes.

2 Mathematics 1: familiar content, complete coverage

Mathematics 1 is compulsory and assumed everywhere else. The trap is treating familiar GCSE labels as automatic marks.

- **Units and number (M1, M2):** compound-unit conversions; bounds and error intervals (M2.12–13); exact fractions, surds and π ; estimates rather than calculator-shaped decimals.
- **Ratio and algebra (M3, M4):** inverse proportion with integer or fractional powers (M3.9); growth, decay and simple iteration (M3.11); linear–quadratic simultaneous equations (M4.15); graph gradients and areas in context (M4.14).
- **Geometry (M5):** negative and fractional scale factors (M5.6); circle theorems (M5.9); plans, elevations and bearings (M5.12–13); vectors used for arguments (M5.19).

- **Statistics and probability (M6, M7):** unequal-width histograms and frequency density (M6.2); estimates from grouped data (M6.3); interpolation versus dangerous extrapolation (M6.4); conditional probability without replacement (M7.7).

One useful boundary: Mathematics 1 explicitly says candidates are not expected to recall or use the sine and cosine rules (M5.18). They are in Mathematics 2 instead.

3 Mathematics 2: small clauses with large consequences

- Recurrences and finite/infinite geometric series sit beside arithmetic series (MM2.1–3).
- The sine rule includes the ambiguous case, and problems may be in 3D (MM4.1). Radian measure includes sector *and* segment area (MM4.2).
- Log laws are examinable, but change of base is explicitly excluded (MM5.2).
- Differentiation from first principles is excluded. Rational powers, second derivatives, normals and strict increasing/decreasing intervals are included. Inflexions need qualitative understanding only and are not examined (MM6.1–3).
- Integration: distinguish signed integral from geometric area (MM7.1); combine contiguous ranges (MM7.4); judge trapezium estimates (MM7.5); solve $dy/dx = f(x)$ (MM7.6).
- Composite graph transformations are examinable (MM8.2). Graph intersections represent simultaneous equations (MM8.7).

Worked example The integral is zero; the area is not

Find the area between $y = x^2 - 1$ and the x -axis for $-1 \leq x \leq 2$.

The tempting single integral cancels equal signed pieces:

$$\int_{-1}^2 (x^2 - 1) dx = \left[\frac{x^3}{3} - x \right]_{-1}^2 = 0.$$

Area cannot cancel. Split where the curve crosses the axis, at $x = 1$:

$$A = \int_{-1}^1 (1 - x^2) dx + \int_1^2 (x^2 - 1) dx = \frac{4}{3} + \frac{4}{3} = \boxed{\frac{8}{3}}.$$

Correct: MM7.1 explicitly expects the difference between a definite integral and the area between a curve and an axis. MM7.4 rewards clean range splitting.

Trap: “The integral is zero, so the area is zero” confuses signed accumulation with geometric area. A sketch catches the impossibility in seconds.

4 Physics: the words around each formula matter

- **Electricity (P1):** V–I graphs for a resistor and filament lamp; thermistors, LDRs and ideal diodes; series/parallel rules. The spec asks only the qualitative fact that a parallel total is below any branch resistance, not a memorised reciprocal formula.
- **Magnetism (P2):** field directions, left-hand rule, $F = BIL$ only at right angles, induction direction and output graphs, transformer ratios and transmission losses.
- **Mechanics (P3):** graph areas/gradients, force diagrams, Hooke’s law and spring energy, momentum and rate of change, terminal velocity. Of the usual constant-acceleration equations, only $v^2 - u^2 = 2as$ is expressly named.
- **Thermal and matter (P4–5):** density-driven convection, specific heat, latent heat, ideal-gas $PV = \text{constant}$, hydrostatic pressure.
- **Waves and radioactivity (P6–7):** what refraction changes and preserves; Doppler effect; full EM order, uses and hazards; nuclear equations; fields and penetrating/ionising power; half-life graphs including decay products.

5 Chemistry: breadth is the difficulty

The 17 sections make selective revision dangerous. High-yield corners include weighted A_r from mass-spectrometer data (C1.5–6); equilibrium changes (C3.5); limiting reactants, titrations and yield (C4.6–11); disproportionation and agents (C5.5–6); separation methods including centrifugation and a separating funnel (C8.3); polyprotic acids (C9.1); catalysts not moving equilibrium (C10.6); electrolysis competition (C12.4); condensation polymers (C13.4); and the full test tables (C16).

Two boundaries stop wasted cramming: crude-oil fraction names and uses are not expected (C13.1), and alkene mechanisms or carbocation stability are not required (C13.3). You still need to predict named addition products and write equations.

2 Try it

For C16, make a blank grid with gas, anion, cation, flame and water tests. Fill reagent, observation and inference from memory. “Silver nitrate gives a precipitate” is incomplete until nitric acid and the white/cream/yellow mapping are secure.

6 Biology: processes, comparisons and data

Biology is not eleven vocabulary lists. The verbs in the specification demand mechanism and interpretation.

- Osmosis is specified in terms of water potential, beside diffusion and active transport (B2.1).
- Mitosis, meiosis and reproduction must be compared by divisions, ploidy, identity and purpose (B3); pedigrees and single-gene probabilities are in B4.3.
- Genetic engineering includes restriction enzymes and ligase; stem cells require totipotent, pluripotent and multipotent distinctions (B6).
- Animal physiology includes ECGs, nephron structure, ADH, four menstrual-cycle hormones, vaccination, and pre-clinical versus clinical testing (B9).
- Ecosystems include quadrats, belt transects, fish farming, acid rain and eutrophication (B10). Plant physiology includes xylem/phloem adaptation, stomata and environmental effects on transpiration (B11).

Do not inflate the list into an A-level molecular-biology course. Learn the exact chain the point names, then practise applying it to unfamiliar data, diagrams and competing explanations.

7 Build a checklist that can finish

For each required point, use four boxes:

☐ recall ☐ apply untimed ☐ apply mixed ☐ apply timed.

A point is not closed because notes exist. It is closed when you can retrieve it, recognise it inside a mixed problem and execute it without donating two minutes. Re-open any point that causes the same error twice.

8 Sources and mapping

UAT-UK, ESAT Content Specification for assessment in October 2026 and January 2027

The module assumptions, all section and point IDs, and explicit inclusions/exclusions decoded here. [Open the official ESAT hub.](#)

UniGenius specification check

The guide was cross-checked against 76 Mathematics 1, 39 Mathematics 2, 32 Physics, 89 Chemistry and 34 Biology top-level point records.

The official PDF is authoritative if wording changes. Course requirements decide which modules you need; do not revise an optional science by accident.