

Predicted Mock Paper 1: mark scheme

Physics · Foundation Tier · for the 2027 exams · 100 marks

How to use this mark scheme

- Each marking point is worth 1 mark unless stated. Alternative acceptable answers are shown with **allow**; answers that do not score are shown with **do not accept**.
- **Calculations:** full marks for the correct answer with no working. If the answer is wrong, award marks for correct working (substitution, rearrangement, unit conversion).
- **Errors carried forward (ecf):** an error in one part is only penalised once; credit later working that correctly uses an earlier wrong value.
- **Lists:** if more answers are given than asked for, a wrong answer cancels a right one.
- **6-mark questions** are marked by levels. Decide the level from the overall quality, then the mark within the level from how much of the indicative content is covered.
- Grade estimate (Foundation): roughly 70%+ ≈ 5, 57% ≈ 4, 43% ≈ 3, 28% ≈ 2. These are a guide only: real grade boundaries change every year. Grade 5 is the highest grade available on Foundation tier.

Why these questions? (the prediction)

The prediction is based on AQA's published examiner reports for recent series (June 2023–2025), the specification, and the 2027 arrangements (the Physics Equations Sheet is provided again in 2027).

- **Units and conversions.** Foundation students lose the most calculation marks by not converting units (minutes → seconds, g → kg, kW → W, cm → m). Almost every calculation on this paper needs a conversion or asks for a unit.
- **Recall marks are banked early.** Foundation papers open with shorter recall and multiple-choice questions (energy stores, renewable resources, circuit symbols, atomic structure). These are reliable marks.
- **Required practicals rotate.** Specific heat capacity (RP1) was the 2025 six-mark practical, so this paper uses density (RP5) and thermal insulation (RP2).
- **Common questions.** Questions 9 and 10 also appear on the Higher paper, as AQA does every year. Series circuits (Question 10) were answered very poorly in 2025.

Question 1

Why it's predicted: Naming energy stores and calculating kinetic energy appear on almost every Foundation Paper 1.

Q	Answers / marking points	Mark	Spec
01.1	• Elastic potential	1	4.1.1.1
01.2	• thermal (allow internal) • gravitational potential • kinetic	3	4.1.1.1
01.3	• Ek = 0.5 × 800 × 15² • Ek = 90 000 J An answer of 6000 J (speed not squared) scores 1 mark.	2	4.1.1.2
01.4	• 90 kJ (allow ecf: answer to 01.3 ÷ 1000)	1	Maths
01.5	• it is transferred to the thermal store of the brakes / surroundings (allow: wasted as heat)	1	4.1.2.1

Question 2

Why it's predicted: Energy resources are tested every year. Reading data from a table and calculating a percentage are common Foundation maths skills.

Q	Answers / marking points	Mark	Spec
02.1	• Geothermal • Tides Deduct one mark for each extra box ticked.	2	4.1.3
02.2	• 29 + 10 + 5 + 2 • = 46% Allow 1 mark for adding at least three of the four renewables correctly.	2	4.1.3
02.3	• no electricity at night / less when cloudy / unreliable (allow: needs a large area)	1	4.1.3
02.4	• reliable / can be switched on quickly to meet a sudden demand (allow: large output)	1	4.1.3
02.5	• releases carbon dioxide • which causes global warming / climate change • *or* releases sulfur dioxide, which causes acid rain Max 2. The problem must be linked to the gas that causes it.	2	4.1.3
02.6	• Uranium	1	4.1.3

Question 3

Why it's predicted: Circuit symbols and Q = I t with a time conversion are among the most reliable Foundation marks, and minutes → seconds is the most common lost mark.

Q	Answers / marking points	Mark	Spec
03.1	• A: light-dependent resistor (LDR) • B: diode • C: thermistor	3	4.2.1.1
03.2	• In series with the component	1	4.2.1.3
03.3	• 2 minutes = 120 s • Q = 0.50 × 120 • Q = 60 C An answer of 1 C (minutes not converted) scores 1 mark.	3	4.2.1.3
03.4	• V = 0.50 × 12 • V = 6.0 V	2	4.2.1.3
03.5	• 12 Ω	1	4.2.2
03.6	• resistance decreases • automatic night lights / street lights / outdoor security lights	2	4.2.1.4

Question 4

Why it's predicted: Density (RP5) has not been the six-mark practical recently. Converting g/cm³ into kg/m³ is a units skill the examiners say is often missed.

Q	Answers / marking points	Mark	Spec
04.1	• Solid	1	4.3.1.1
04.2	**Level 3:** A detailed and coherent answer that covers the points below in a logical sequence, linking ideas clearly. (5–6 marks) **Level 2:** A clear answer covering several relevant points, but with some gaps or less logical order. (3–4 marks) **Level 1:** Simple, relevant statements with little linking or structure. (1–2 marks) **Level 0:** No relevant content. (0 marks) **Indicative content** • measure the mass of the stone using a (top-pan) balance • fill a eureka (displacement) can with water up to the spout • place an empty measuring cylinder under the spout • lower the stone gently into the can (on a thread) • measure the volume of water that comes out: this equals the volume of the stone • read the measuring cylinder at eye level / at the bottom of the meniscus • density = mass ÷ volume • repeat and calculate a mean Level 3 needs how the mass and the volume are measured, and how density is calculated. A method using a measuring cylinder and the change in water level is also acceptable.	6	4.3.1.1 RP5
04.3	• ρ = 54 ÷ 20 • ρ = 2.7 g/cm³	2	4.3.1.1
04.4	• 2700 kg/m³ (allow ecf: answer to 04.3 × 1000)	1	Maths
04.5	• the particles in a gas are much further apart • so there is less mass in the same volume	2	4.3.1.1

Question 5

Why it's predicted: Students often say temperature rises while a substance melts. Calculations with ΔE = m c Δθ and E = P t (with a minutes conversion) are very common on Foundation.

Q	Answers / marking points	Mark	Spec
05.1	• melting • boiling / evaporating • condensing	3	4.3.1.2
05.2	• It increases	1	4.3.2.1
05.3	• ΔE = 2.0 × 4200 × 20 • ΔE = 168 000 J	2	4.3.2.2
05.4	• 2.0 kW = 2000 W and 3 minutes = 180 s • E = 2000 × 180 • E = 360 000 J Award 1 mark for each conversion if the final answer is wrong (max 2).	3	4.1.1.4
05.5	• 0.50 kg (mass is conserved)	1	4.3.1.2

Question 6

Why it's predicted: Subatomic particles and the development of the model of the atom are reliable Foundation questions.

Q	Answers / marking points	Mark	Spec
06.1	• proton: +1 • neutron: 1 • electron: −1	3	4.4.1.2
06.2	• 3 protons and 3 electrons • 4 neutrons All three correct = 2 marks; two correct = 1 mark.	2	4.4.1.2
06.3	• it has the same number of protons (positive) as electrons (negative)	1	4.4.1.2
06.4	• plum pudding: a ball of positive charge with electrons embedded in it • nuclear: the positive charge (and most of the mass) is in a tiny nucleus, with electrons outside it / mostly empty space One mark for each model described.	2	4.4.1.3
06.5	• most went straight through: the atom is mostly empty space • a few deflected: the nucleus is (small and) positively charged / has a concentrated charge	2	4.4.1.3

Question 7

Why it's predicted: Properties of alpha, beta and gamma, reading a half-life from a graph, and contamination vs irradiation all appear regularly at Foundation.

Q	Answers / marking points	Mark	Spec
07.1	• alpha • alpha • gamma	3	4.4.2.1
07.2	• the time it takes for the number of unstable nuclei (in a sample) to halve / the time for the activity to fall to half	1	4.4.2.3
07.3	• construction lines from 800 Bq to 400 Bq (or any halving) • half-life = 8 days	2	4.4.2.3
07.4	• 24 ÷ 8 = 3 half-lives / 800 → 400 → 200 → 100 • 100 Bq Allow ecf from 07.3.	2	4.4.2.3
07.5	• contamination: radioactive atoms get onto / into the person or object (and keep decaying) • irradiation: the person or object is exposed to radiation from outside, but does not become radioactive	2	4.4.2.4

Question 8

Why it's predicted: Wire colours, P = V I and the earth wire appear on almost every Foundation paper.

Q	Answers / marking points	Mark	Spec
08.1	• 50 Hz	1	4.2.3.1
08.2	• brown • blue • green and yellow (stripes)	3	4.2.3.2
08.3	• P = 230 × 10 • P = 2300 W	2	4.2.4.1
08.4	• 2.3 kW (allow ecf)	1	Maths
08.5	• a large current flows through the earth wire (to the ground) instead of through the user • this melts the fuse / trips the circuit breaker, disconnecting the supply	2	4.2.3.2

Question 9

Why it's predicted: Required practical 2 (thermal insulation) is predicted as the second six-mark practical. **Common question:** this also appears on the Higher paper.

Q	Answers / marking points	Mark	Spec
09.1	**Level 3:** A detailed and coherent answer that covers the points below in a logical sequence, linking ideas clearly. (5–6 marks) **Level 2:** A clear answer covering several relevant points, but with some gaps or less logical order. (3–4 marks) **Level 1:** Simple, relevant statements with little linking or structure. (1–2 marks) **Level 0:** No relevant content. (0 marks) **Indicative content** • wrap a beaker in a layer of insulating material (e.g. bubble wrap / cotton wool / newspaper) • pour a fixed volume of hot water into the beaker (measured with a measuring cylinder) / same starting temperature • put a lid on the beaker and a thermometer through the lid • record the starting temperature, start a stopwatch and record the temperature after a fixed time (e.g. 10 minutes) • calculate the temperature decrease • repeat with different numbers of layers (e.g. 0 to 4 layers) • control variables: same volume of water, same starting temperature, same beaker, same type of insulation, same time, same room temperature • repeat each test and calculate a mean Level 3 needs a method that could be followed to get valid results, including measurements and at least two control variables.	**6**	4.1.2.1 RP2
09.2	• as the number of layers increases, the temperature decrease gets smaller • each extra layer has a smaller effect / the decrease is not proportional	**2**	4.1.2.1
09.3	• use a digital thermometer / temperature probe and data logger with a resolution of 0.1 °C	**1**	WS 3.5

Question 10

Why it's predicted: In June 2025, series and parallel circuits were answered very poorly. Potential dividers with a sensor are a favourite. **Common question:** this also appears on the Higher paper.

Q	Answers / marking points	Mark	Spec
10.1	• they are in series / there is only one path for the charge	**1**	4.2.2
10.2	• total resistance = 10 + 20 = 30 Ω • I = V ÷ R = 6.0 ÷ 30 • I = 0.2 A	**3**	4.2.4
10.3	• V = 0.2 × 10 • V = 2.0 V (allow ecf from 03.2)	**2**	4.2.4
10.4	• resistance of the thermistor decreases • so the total resistance decreases and the current increases • so the p.d. across the resistor / voltmeter reading increases • *allow*: the thermistor takes a smaller share of the 6.0 V, so the resistor takes a larger share Max 3.	**3**	4.2.1.4
10.5	• the total resistance (of the circuit) decreases (the parallel pair has a smaller resistance than 10 Ω) • so the current from the battery increases	**2**	4.2.4