

Predicted Mock Paper 2: 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.** km/h → m/s, minutes → seconds and cm → m are tested in the forces and waves calculations, because these are where Foundation students lose the most marks.
- **Graph skills.** Plotting points, drawing a line of best fit and reading a distance–time graph are Foundation maths skills that appear every year.
- **Required practicals rotate.** Force and extension (RP6) was the 2025 practical, so it appears here only as data analysis. The six-mark practicals are light (RP9) and acceleration (RP7).
- **Common questions.** Questions 10 and 11 also appear on the Higher paper, as AQA does every year.

Question 1

Why it's predicted: Contact and non-contact forces, W = m g and resultant forces in a line are tested on almost every Foundation Paper 2.

Q	Answers / marking points	Mark	Spec
01.1	• Air resistance • Friction Deduct one mark for each extra box ticked.	2	4.5.1.2
01.2	• Velocity	1	4.5.1.1
01.3	• W = 60 × 9.8 • W = 588 N (allow 590 N)	2	4.5.1.3
01.4	• 300 N • forwards	2	4.5.1.4
01.5	• it moves at a constant speed in a straight line (constant velocity)	1	4.5.6.2.1
01.6	• The student pulls the Earth up with 588 N	1	4.5.6.2.3

Question 2

Why it's predicted: Force and extension was the 2025 practical, so a data-analysis question (plotting, line of best fit, limit of proportionality) is more likely than another method question.

Q	Answers / marking points	Mark	Spec
02.1	• the object returns to its original shape (and length) when the force is removed	1	4.5.3
02.2	• all three points plotted correctly to within half a small square • *allow* 1 mark for two points correct	2	WS 3.2
02.3	• straight line through the origin and the first five points (up to 4 N); may curve after 4 N	1	WS 3.2
02.4	• 5 N	1	4.5.3
02.5	• 4.0 cm = 0.040 m • k = F ÷ e = 2 ÷ 0.040 • k = 50 N/m An answer of 0.5 (cm not converted) scores 1 mark.	3	4.5.3
02.6	• wear eye protection (in case the spring snaps) • clamp the stand to the bench / put a tray or soft surface under the weights	1	4.5.3 RP6

Question 3

Why it's predicted: Reading distance–time graphs and converting km/h and minutes are reliable Foundation questions, and the 2025 report flagged unit errors in s = v t.

Q	Answers / marking points	Mark	Spec
03.1	• 1.5 m/s	1	4.5.6.1.2
03.2	• stationary / stopped (not moving)	1	4.5.6.1.4
03.3	• speed = 100 ÷ 20 • = 5.0 m/s	2	4.5.6.1.4
03.4	• 36 × 1000 ÷ 3600 (allow 36 ÷ 3.6) • = 10 m/s	2	Maths
03.5	• 2 minutes = 120 s • s = 10 × 120 • s = 1200 m An answer of 20 m (minutes not converted) scores 1 mark.	3	4.5.6.1.2
03.6	• a = 12 ÷ 4.0 • a = 3.0 m/s²	2	4.5.6.1.5

Question 4

Why it's predicted: Factors affecting thinking and braking distance appear every year. The 2025 report showed students mixing up the two.

Q	Answers / marking points	Mark	Spec
04.1	• braking	1	4.5.6.3.1
04.2	• Drinking alcohol • Tiredness Deduct one mark for each extra box ticked.	2	4.5.6.3.2
04.3	• less friction between the tyres and the road • so the car takes a longer distance to stop (smaller deceleration)	2	4.5.6.3.3
04.4	• s = 20 × 0.70 • s = 14 m	2	4.5.6.3.2
04.5	• 38 m (allow ecf: answer to 04.4 + 24)	1	4.5.6.3.1
04.6	• brakes overheat / driver loses control (skids) / injury to passengers	1	4.5.6.3.3

Question 5

Why it's predicted: v = f λ with a cm → m conversion and the ripple tank practical (RP8) are very likely. Students often forget that waves transfer energy, not matter.

Q	Answers / marking points	Mark	Spec
05.1	• transverse: any electromagnetic wave (e.g. light) / water ripples / waves on a string • longitudinal: sound / ultrasound / seismic P-waves	2	4.6.1.1
05.2	• parallel to the direction of energy transfer (back and forth along the direction the wave travels)	1	4.6.1.1
05.3	• Energy only	1	4.6.1.1
05.4	• 2.5 cm = 0.025 m • v = 12 × 0.025 • v = 0.30 m/s An answer of 30 scores 2 marks (cm not converted).	3	4.6.1.2
05.5	• T = 1 ÷ 4.0 • T = 0.25 s	2	4.6.1.2
05.6	• one wavelength is very small / the waves are moving, so it is hard to measure accurately • measuring over 10 waves reduces the (percentage) uncertainty / gives a more accurate value	2	4.6.1.2 RP8

Question 6

Why it's predicted: The order of the EM spectrum, uses and hazards are banked marks on every Foundation Paper 2.

Q	Answers / marking points	Mark	Spec
06.1	• microwaves (second box) • X-rays (sixth box)	2	4.6.2.1
06.2	• microwaves: cooking food / satellite communications • infrared: electrical heaters / cooking / thermal imaging cameras / remote controls / fibre optics • X-rays: medical imaging (seeing broken bones) / airport security	3	4.6.2.4
06.3	• skin cancer / premature ageing of the skin / sunburn	1	4.6.2.3
06.4	• They all travel at the same speed in a vacuum	1	4.6.2.1
06.5	• refraction • the speed of light changes (decreases) when it enters the glass Do not accept 'light bends' as the explanation.	2	4.6.2.2
06.6	• a line at 90° (right angles) to the surface where the ray meets it	1	4.6.2.2

Question 7

Why it's predicted: Required practical 9 (reflection and refraction) has not been the six-mark practical recently, and it suits Foundation well.

Q	Answers / marking points	Mark	Spec
07.1	**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** • place the glass block on a sheet of paper and draw around it • use a ray box (with a slit) to shine a single ray of light at the block • mark the path of the incident ray and the ray leaving the block with crosses • remove the block and join the points to draw the ray through the block • draw the normal (at 90° to the surface) where the ray enters • measure the angle of incidence and the angle of refraction from the normal with a protractor • repeat for different angles of incidence • work in a darkened room so the ray is easy to see Level 3 needs how the ray is traced, that angles are measured from the normal and with a protractor.	6	4.6.2.2 RP9
07.2	• as the angle of incidence increases, the angle of refraction increases • the angle of refraction is always smaller than the angle of incidence (the ray changes direction towards the normal)	2	WS

Question 8

Why it's predicted: Field patterns, magnetic materials and electromagnet strength are core Foundation content. In 2025 field-line diagrams often had no arrows.

Q	Answers / marking points	Mark	Spec
08.1	• closed loops from one pole to the other, not crossing, closer together at the poles • arrows pointing from N to S	2	4.7.1.2
08.2	• a permanent magnet produces its own magnetic field (all the time) • an induced magnet only becomes a magnet when placed in a magnetic field (and loses most of its magnetism when removed)	2	4.7.1.1
08.3	• Iron • Nickel Deduct one mark for each extra box ticked.	2	4.7.1.1
08.4	• increase the current • increase the number of turns on the coil • add an iron core Any two.	2	4.7.2.1
08.5	• the Earth has a magnetic field (its core is magnetic)	1	4.7.1.2
08.6	• It gets weaker	1	4.7.2.1

Question 9

Why it's predicted: The life cycle of a star, orbits and red-shift are the most commonly tested Foundation space questions.

Q	Answers / marking points	Mark	Spec
09.1	• nebula → protostar → main sequence star → red giant → white dwarf • all five correct = 2 marks; first three or last three correct = 1 mark	2	4.8.1.2
09.2	• Gravity	1	4.8.1.3
09.3	• A natural satellite	1	4.8.1.1
09.4	• the galaxies are moving away from us • the universe is expanding (supports the Big Bang theory)	2	4.8.2
09.5	• (hydrogen) nuclei join together • to form helium (a heavier nucleus), releasing energy	2	4.8.1.2

Question 10

Why it's predicted: Required practical 7 (acceleration) has been asked less often than RP6, which appeared in 2025. **Common question:** this also appears on the Higher paper.

Q	Answers / marking points	Mark	Spec
10.1	**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** • trolley on a runway / bench, attached by string over a pulley to a mass hanger • hanging weight provides the accelerating force • light gates (and data logger) / ticker timer / video measure the acceleration (or time between two points and calculate a = Δv ÷ t) • change the force by moving masses from the trolley to the hanger • so the total mass of the system stays constant • release the trolley from the same point each time • repeat for each force and calculate a mean • tilt the runway slightly to compensate for friction Level 3 must include how acceleration is measured and how the total mass is kept constant.	6	4.5.6.2.2 RP7
10.2	• friction acts on the trolley • so a small force is needed before the trolley starts to accelerate / the resultant force is less than the weight on the hanger	2	WS

Question 11

Why it's predicted: Velocity–time graphs appear regularly on Paper 2. **Common question:** this also appears on the Higher paper.

Q	Answers / marking points	Mark	Spec
11.1	• constant velocity of 8 m/s	1	4.5.6.1.5
11.2	• a = 8 ÷ 10 • a = 0.80 m/s²	2	4.5.6.1.5
11.3	• a = 8 ÷ 20 • a = 0.40 m/s²	2	4.5.6.1.5
11.4	• between 10 s and 40 s • the velocity is constant (not accelerating), so the forces are balanced	2	4.5.6.2.1