Teacher Intervention Report

TEST2-AQA-8464P2H-QP-JUN25 | AQA | 1 batch | 3 Sept 2026

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20	36.4/70	20	0
STUDENTS	MEAN AVERAGE	PASSING	BELOW PASS

1. Question Performance (Worst to Best)

All questions sorted by average score - focus reteaching on top rows

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
Q5.1	A student used a temperature probe to measure the temperature of melting ice. Method: 1. Place probe in iced water and record temperature. 2. Remove probe and allow to return to room temperature. 3. Repeat steps 1 and 2 four more times. The measurements were: −0.5 °C, +0.2 °C, −0.3 °C, +0.5 °C, +0.1 °C. What type of error is shown by the measurements?	Waves	Black body radiation (physics only) > Emission and absorption of infrared radiation	-	0/1		0%	[1 mark] **AO3:** random
Q4.3	The student replaced the straight wire with a loop of wire on an axle so the loop could rotate, connected to a battery and a switch. Figure 6 shows the apparatus: a loop of wire between a N pole magnet (left, near side A) and a S pole magnet (right, near side B), on an axle, connected to a battery via a switch. When the switch is closed, magnetic forces on the loop make the loop begin to rotate. Explain how. You should refer to side A and side B of the loop of wire in Figure 6.	Magnetism and electromagnetism	The motor effect > Electric motors (HT only)	-	0.4/5		0%	[5 marks] **AO1:** there is a magnetic field between the poles of the magnets **AO1:** a current in a loop of wire causes a magnetic field **AO1:** the current is in opposite directions in side A and side B **AO1:** (so) the (vertical) forces on side A and side B are in opposite directions **AO1:** the force on side A is downwards **or** the force on side B is upwards
Q3.5	A ray of visible light incident on the lens in a pair of sunglasses is refracted. Figure 3 shows a wave front diagram for visible light travelling through air (wave fronts at an angle) incident on the lens. For each wave front, one end of the wave front enters the lens before the other end. Explain why the light refracts as it enters the lens.	Waves	Electromagnetic waves > Properties of electromagnetic waves 1	-	0.2/2		0%	[2 marks] **AO1:** the speed of the light / waves / wavefronts decreases (when entering the lens) **AO1:** (so) one end of the wavefront slows before the other end
Q5.2	Using the melting ice temperature measurements (−0.5 °C, +0.2 °C, −0.3 °C, +0.5 °C, +0.1 °C), determine the uncertainty in the measurements.	Waves	Black body radiation (physics only) > Emission and absorption of infrared radiation	-	0.2/2		0%	[2 marks] **AO3:** range = 0.5 – (−0.5) **or** range = 1 **or** uncertainty = (0.5 – (−0.5)) / 2 **AO3:** uncertainty = (±) 0.5 (°C)
Q6.4	After running round the track once, the rest of the run was on a straight,	Forces	Forces and motion > Acceleration	-	0.3/2		0%	[2 marks] **AO3:** the gradient is equal to the deceleration /

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	horizontal road. Using Figure 8 (the Run part of the speed-time graph curves downward from ~4 m/s to ~2.2 m/s with increasing steepness), explain how Figure 8 shows that the magnitude of the deceleration of the athlete increased.							acceleration **AO3:** (and) the (magnitude of the) gradient increased
Q6.3	Figure 8 (speed-time graph for the whole triathlon) is repeated. The first part of the run was on a circular track. The time taken for the athlete to run round the track was 100 s. Describe the velocity of the athlete during the first 100 s of the run. Use Figure 8.	Forces	Forces and motion > Velocity	-	0.4/2		0%	[2 marks] **AO2:** constant magnitude (of velocity) **AO1:** direction (of velocity) kept changing
Q3.1	A pair of sunglasses has lenses that absorb all ultraviolet and some visible light. Ultraviolet and visible light are both transverse waves. What is meant by 'transverse waves'?	Waves	Waves in air, fluids and solids > Transverse and longitudinal waves	-	0.5/2		0%	[2 marks] **AO1:** oscillations / vibrations are perpendicular to the direction of energy transfer
Q1.6	The rope exerted a force on the sled when the sled was moving. What is the Newton's Third Law pair to the force of the rope on the sled? Tick one box. Options: The force of friction on the sled; The force of the dogs on the rope; The force of the sled on the rope	Forces	Forces and motion > Newton's Third Law	-	0.3/1		0%	[1 mark] **AO1:** the force of the sled on the rope
Q2.3	Two identical cars were driven along a straight, level road. One car had a greater speed than the other car. The driver of each car applied the brakes until the cars stopped. Both cars travelled the same distance while braking. Explain how braking from a greater speed affected the risk of the brakes overheating.	Forces	Forces and motion > Factors affecting braking distance 2	-	1/3		0%	[3 marks] **AO1:** frictional / braking force is greater (for the faster car) **or** the faster car has more kinetic energy **AO3:** (so) more work done (by the brakes to stop the faster car) **AO3:** (so) the risk of the brakes overheating is greater (for the fast car)
Q2.2	As a safety measure, the speed limit on the road was reduced. Explain how the safety of road users is affected by: the condition of the brakes and tyres; reduced speed. You should refer to thinking distance and braking distance.	Forces	Forces and motion > Stopping distance	-	2.45/6		0%	[6 marks] **AO2: Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account. **AO1: Level 2:** Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear. **AO1: Level 1:** Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking. **AO1:** No relevant content
Q5.5	The student made two observations: 1. The rate of change of temperature was initially greater for the black cube than for the white	Waves	Black body radiation (physics only) > Emission and absorption of infrared radiation	-	1.65/4		0%	[4 marks] **AO1:** black surfaces are good absorbers (and emitters of infrared / radiation)

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	cube. 2. After a few minutes, both cubes stopped changing temperature. Explain the student's observations. You should refer to the absorption and emission of radiation from the surfaces of the cubes.							**AO1:** white surfaces are poor absorbers (and emitters of infrared / radiation) **AO1:** as the temperature of the cubes increases the cubes emit infrared / radiation at a greater rate **AO1:** at maximum / constant temperature, each cube emits infrared /radiation at the same rate that it absorbs infrared / radiation
Q3.6	Figure 4 shows a ray of visible light incident on glass, travelling from air, with the angle of incidence 45°. The angle of refraction of the ray in the glass is 28°. Complete the ray diagram in Figure 4 to show the path of the ray in the glass. You should: draw the normal line; draw the refracted ray in the glass. You do not need to draw the ray leaving the glass.	Waves	Electromagnetic waves > Properties of electromagnetic waves 1	-	0.95/2		0%	[2 marks] **AO2:** normal line drawn **AO2:** ray drawn with an angle of refraction of 28°
Q2.1	The stopping distance of a car is affected by the condition of the brakes and tyres. A car is being driven around a corner when the driver sees some roadworks. The driver applies the brakes when the car is 24 m away from the roadworks. The velocity of the car changes from 18 m/s to 0 m/s. Calculate the constant deceleration needed to stop the car in a distance of 24 m. Use the Physics Equations Sheet.	Forces	Forces and motion > Acceleration	-	1.6/3		0%	[3 marks] **AO2:** $(0^2 -) 18^2 = 2 \times a \times 24$ **AO2:** $a = (-)18^2 / (2 \times 24)$ **AO2:** $a = (-) 6.75$ (m/s²)
Q3.3	Complete the sentence. Compared with the wavelength of visible light, the wavelength of ultraviolet is _____.	Waves	Electromagnetic waves > Types of electromagnetic waves	-	0.55/1		0%	[1 mark] **AO1:** shorter
Q3.4	A wave of visible light has a frequency of 6.25×10^{14} Hz. speed of light = 3.00×10^8 m/s. Calculate the wavelength of this light. Use the Physics Equations Sheet. Give your answer in nanometres (nm).	Waves	Waves in air, fluids and solids > Properties of waves	-	2.25/4		0%	[4 marks] **AO2:** $3.00 \times 10^8 = 6.25 \times 10^{14} \times \lambda$ **AO2:** $\lambda = 3.00 \times 10^8 / 6.25 \times 10^{14}$ **AO2:** $\lambda = 4.80 \times 10^{-7}$ (m) **AO2:** $\lambda = 480$ (nm)
Q4.2	A student positioned a straight wire in the magnetic field between two magnets. The wire was perpendicular to the magnetic field. There was a current of 0.56 A in the wire. The magnetic force on the wire was 2.1 mN. The length of wire in the magnetic field was 0.050 m. Calculate the magnetic flux density of the magnetic field between the magnets. Use the Physics Equations Sheet. Give the unit.	Magnetism and electromagnetism	The motor effect > Fleming's left-hand rule (HT only)	-	2.85/5		0%	[5 marks] **AO2:** 2.1 mN = 0.0021 N **AO2:** $0.0021 = B \times 0.56 \times 0.050$ **AO2:** $B = 0.0021 / (0.56 \times 0.050)$ **AO2:** B = 0.075 **AO1:** tesla **or** T

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
Q1.4	Figure 2 shows a distance-time graph for the sled at the start of the race (a curve of increasing gradient, distance rising from 0 to 30 m over 10 s). What does the gradient of the graph in Figure 2 represent?	Forces	Forces and motion > The distance-time relationship	-	0.6/1		0%	[1 mark] **AO1:** speed
Q3.2	Ultraviolet can cause sunburn and eye damage. Give one other risk to health from exposure to ultraviolet.	Waves	Electromagnetic waves > Properties of electromagnetic waves 2	-	0.7/1		0%	[1 mark] **AO1:** skin cancer **or** causes skin to age (prematurely)
Q6.2	Figure 8 shows a speed-time graph for the athlete for the whole triathlon (Swim: ~1.5 m/s from 0 to 500 s; Cycle: rises to 7.5 m/s at 500 s then falls linearly to 6.2 m/s at ~1900 s; Run: drops to ~4 m/s at ~1900 s then curves down to ~2.2 m/s at ~2800 s). The cycling part of the race was on a straight road. The work done by the forward force on the bicycle was 110 000 J. Determine the mean forward force on the bicycle. Use the Physics Equations Sheet.	Forces	Forces and motion > Acceleration	-	4.3/6		0%	[6 marks] **AO3:** time taken = 1400 **AO3:** mean speed = (7.5 + 6.2) / 2 (= 6.85 m/s) **AO3:** distance (= 6.85 × 1400) = 9590 (m) **AO3:** 110 000 = F × 9590 **AO3:** F = 110 000 / 9590 **AO3:** F = 11(.470…) (N) **AO3: OR** time taken = 1400 **AO3:** area of triangle = 0.5 × 1400 × (7.5 − 6.2) (= 910) **and** area of rectangle = 1400 × 6.2 (= 8680) **AO3:** distance (= 910 + 8680) = 9590 (m) **AO3:** 110 000 = F × 9590 **AO3:** F = 110 000 / 9590 **AO3:** F = 11(.470…) (N) **AO3: OR** time taken = 1400 **AO3:** acceleration = (6.2 − 7.5) / 1400 (= (−)0.00092857…) **AO3:** distance (= (6.2² − 7.5²) / ((−)2 × 0.00092857…)) = 9590 (m) **AO3:** 110 000 = F × 9590 **AO3:** F = 110 000 / 9590 **AO3:** F = 11(.470…) (N)
Q5.4	The temperature of the black cube increased from 18 °C to 63 °C in the first 2.0 minutes. Calculate the average rate of change of temperature of the black cube in the first 2.0 minutes. Give your answer in °C/s.	Waves	Black body radiation (physics only) > Emission and absorption of infrared radiation	-	2.2/3		0%	[3 marks] **AO2:** 2 minutes = 120 seconds **AO2:** rate = (63 − 18) / 120 **AO2:** rate = 0.375 (°C/s)
Q4.1	When there is a current in a wire, there is a magnetic field around the wire. Figure 5 shows a wire passing through a piece of card, with a current in the wire in the direction shown (upwards). Draw two magnetic field lines on the card in Figure 5 to show the magnetic field pattern around the wire.	Magnetism and electromagnetism	The motor effect > Electromagnetism	-	1.5/2		10%	[2 marks] **AO1:** (at least) 2 concentric rings around the point where the wire passes through the card **AO1:** with arrow(s) drawn in anticlockwise direction around the wire

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
Q1.5	Later in the race, the sled moved at a constant speed along a flat, horizontal path. What was the relationship between the size of the horizontal forces acting when the sled moved at a constant speed? Tick one box. Options: friction + air resistance < pull of the rope on the sled; friction + air resistance = pull of the rope on the sled; friction + air resistance > pull of the rope on the sled	Forces	Forces and motion > Newton's First Law	-	0.9/1		0%	[1 mark] **AO1:** friction + air resistance = pull of the rope on the sled
Q1.3	At the start of the race, 6 dogs pulled on the rope. The average forward force on the sled from each dog was 370 N. The backwards force on the sled from friction was 520 N. Calculate the resultant force on the sled.	Forces	Forces and elasticity > Resultant forces	-	1.85/2		0%	[2 marks] **AO2:** F = (6 × 370) - 520 **AO2:** F = 1700 (N)
Q1.1	In a dog-sled race, a team of dogs pull on a rope attached to a sled (Figure 1 shows a dog-sled team). Use the Physics Equations Sheet. What equation links distance travelled, speed and time? Tick one box. Options: distance travelled = speed × time; speed = time × distance travelled; time = distance travelled × speed	Forces	Forces and motion > Speed	-	0.95/1		0%	[1 mark] **AO1:** distance travelled = speed × time
Q1.2	The longest dog-sled race in the world covers a distance of 1 500 000 m. One team finished the race in a time of 670 000 s. Calculate the average speed of this team during the race. Use the Physics Equations Sheet.	Forces	Forces and motion > Speed	-	2.9/3		0%	[3 marks] **AO2:** 1 500 000 = v × 670 000 **AO2:** v = 1 500 000 / 670 000 **AO2:** v = 2.2... (m/s)
Q5.3	The student investigated how the colour of an object affects the rate of change of temperature. Method: make two identical clay cubes, paint one black and one white, push a temperature probe into the centre of each, place 10 cm from an infrared heater, record temperature every two minutes. Table 1 (white cube): Time (min): 0, 2, 4, 6, 8, 10, 12; Temperature (°C): 18, 55, 68, 73, 65, 76, 76. Complete Figure 7. You should: use a suitable scale for the y-axis; plot the data from Table 1; draw a lin	Waves	Black body radiation (physics only) > Emission and absorption of infrared radiation	-	3.9/4		0%	[4 marks] **AO2:** y-axis scale of 10 °C per cm **AO2:** all points plotted correctly **AO3:** curved line of best fit ignoring anomalous point at 8 minutes
Q6.1	A triathlon race consists of swimming, cycling and running. One athlete in a triathlon swims at a speed of 1.5 m/s. How does the athlete's swimming speed compare with the typical speed of a person walking? Tick one box. Options: athlete's swimming speed >	Forces	Forces and motion > Speed	-	1/1		0%	[1 mark] **AO1:** athlete's swimming speed = typical walking speed

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
	typical walking speed; athlete's swimming speed = typical walking speed; athlete's swimming speed < typical walking speed							

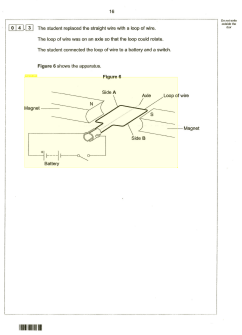
2. Students Below Pass (0 students)

All students below Grade 4 (23%) sorted worst to best - Gap = marks needed (Grade boundaries 2024-26 · AQA · Higher)

Student	Score	%	Gap
All students at or above pass!			

3. Key Misconceptions (with Student Examples)

1 Treating current-carrying wires as permanent magnetic poles (Q4.3)



Example: Test User

92 marks lost here by 20 students:

Students commonly believe that the two sides of a current-carrying wire loop act as isolated North and South permanent magnetic poles that simply attract or repel the surrounding magnets. They fail to understand that the electric current generates a magnetic field that interacts with the permanent field to produce directional forces on each side.

What students wrote:

Test User: "No response detected Because side A is the north pole of a magnet and side B is the south pole of a..."

Test User: "No response detected When the [scribbled out (switfh)] switch is closed, current is able to enter i..."

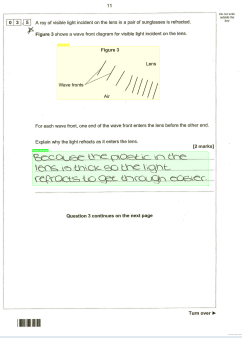
Test User: "No response detected Because side A is the north pole of a magnet And side B is the south pole of a..."

Test User: "Based on the image provided, there are no formal answer lines visible for Question 4.3, but the stud..."

Test User: "No response detected When the [scribbled out swith] Switch is closed, current is able to enter into..."

+ 10 more similar responses

2 Explaining refraction purely by density rather than wave speed change (Q3.5)



Example: Test User

36 marks lost here by 18 students:

Students commonly believe that light bends during refraction simply because the new medium is "thicker" or has a higher density. They do not realise that refraction occurs because the wave's speed decreases upon entering the lens, with one side of the wavefront slowing down before the other.

What students wrote:

Test User: "Because the plastic in the lens is thick so the light refracts to get through easier."

Test User: "The light refracts as it enters the lens as the lens as refraction happens at an angle with one end ..."

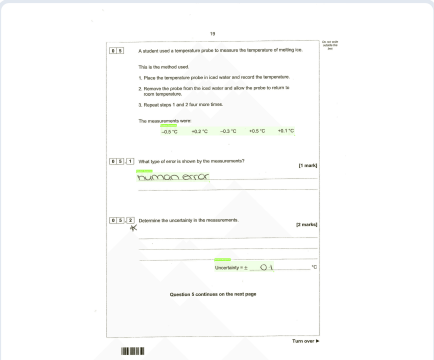
Test User: "The light refracts as it enters the lens as the lens as refraction happens at an angle with one end ..."

Test User: "becase the Ligt is reflected [scribbled out (off of the)] [scribbled out (illegible)] by the glas) [..."

Test User: "The light refracts as the lense causes it to change direction."

+ 10 more similar responses

3 Calculating uncertainty using the mean or full range instead of (Q5.2)



Example: Test User

36 marks lost here by 20 students:

Students commonly think that experimental uncertainty is calculated by finding the sum or mean of the measurements (often resulting in 0), or by simply stating the full range of the data. They do not realise that the uncertainty for a set of repeat readings is calculated by finding the range and dividing it by two.

What students wrote:

Test User: "Uncertainty = ± 0.1 °C"

Test User: "$-0.5 + 0.2 - 0.3 + 0.5 + 0.1 = 0$ Uncertainty = ± 0 °C"

Test User: "$-0.5 + 0.2 - 0.3 + 0.5 + 0.1 = 0\,0 \div 5 = 0$ Answer line: Uncertainty = ± 0 °C"

Test User: "$-0.5 + 0.2 - 0.3 + 0.5 + 0.1 = 0$ Uncertainty = ± 0 °C"

Test User: "$-0.5 + 0.2 - 0.3 + 0.5 + 0.1 = 0\,0 \div 5 = 0$ Answer line: Uncertainty = ± 0 °C"

+ 10 more similar responses

Quick Actions

This Week

- Address Section 1 topics in starter activities
- Pull Section 2 students for 1:1 check-ins

Next Assessment

- Use Section 3 diagnostic Qs as warm-up
- Pre-teach identified misconceptions