GCE A Level Examiners' Report

Physics

A Level

Summer 2026

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Introduction

Our Principal examiners' report provides valuable feedback on the recent assessment series. It has been written by our Principal Examiners and Principal Moderators after the completion of marking and moderation, and details how candidates have performed in each component.

This report opens with a summary of candidates' performance, including the assessment objectives/skills/topics/themes being tested, and highlights the characteristics of successful performance and where performance could be improved. It then looks in detail at each unit, pinpointing aspects that proved challenging to some candidates and suggesting some reasons as to why that might be.[1]

The information found in this report provides valuable insight for practitioners to support their teaching and learning activity. We would also encourage practitioners to share this document – in its entirety or in part – with their learners to help with exam preparation, to understand how to avoid pitfalls and to add to their revision toolbox.

Further support

Document	Description	Link
Professional Learning / CPD	Eduqas offers an extensive programme of online and face-to-face Professional Learning events. Access interactive feedback, review example candidate responses, gain practical ideas for the classroom and put questions to our dedicated team by registering for one of our events here.	https://www.eduqas.co.uk/home/professional-learning/
Past papers	Access the bank of past papers for this qualification, including the most recent assessments. Please note that we do not make past papers available on the public website until 12 months after the examination.	Portal by WJEC or on the Eduqas subject page
Grade boundary information	Grade boundaries are the minimum number of marks needed to achieve each grade. For linear specifications, a single grade is awarded for the subject, rather than for each component that contributes towards the overall grade. Grade boundaries are published on results day.	For unitised specifications click here: Results and Grade Boundaries and PRS (eduqas.co.uk)

[1] ***Please note that where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.***

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Exam Results Analysis	Eduqas provides information to examination centres via the WJEC Portal. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.	Portal by WJEC
Classroom Resources	Access our extensive range of FREE classroom resources, including blended learning materials, exam walk-throughs and knowledge organisers to support teaching and learning.	https://resources.eduqas.co.uk/
Bank of Professional Learning materials	Access our bank of Professional Learning materials from previous events from our secure website and additional pre-recorded materials available in the public domain.	Portal by WJEC or on the Eduqas subject page.
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Executive Summary

It is pleasing to note that there was a significant increase in entry for the qualification this summer. The cohort continues to be very high performing and this was demonstrated by an excellent knowledge and understanding of physics being shown by the majority of candidates. The exam papers were of comparable difficulty to previous series and performance was in line with previous series with only very small changes to the mean seen.

Excellent literacy and numeracy skills were seen. Mathematical skills were particularly strong when handling equations. It is pleasing to note that qualitative responses were as good as quantitative responses, with clear and concise explanations being provided.

Candidates performed very well in many topics, magnetism and electromagnetic induction were two of the lower performing topic areas. Performance in the comprehension question in Component 1 was not as high as in other questions on the paper, hence, developing the comprehension skills of candidates is an area that could aid candidates in future series. Candidates should be encouraged to read the comprehension thoroughly, as in some question parts, it will help them form the required response.

Practical skills were generally very good. The practical question in Component 1 was the best performing question on the paper. The QER question on polarisation on Component 3 was well answered.

Candidates should continue to spend time learning complete definitions. It was common to see partial definitions being provided, for example, just stating that the volume of molecules is negligible with no comparison being made to the size of the container.

The option questions were very well answered, with the physics of sports continuing to be the most popular option, although the energy and the environment option continues to gain in popularity.

Our digital resources website offers blended learning lessons and knowledge organisers, among other materials (link here).

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PHYSICS

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COMPONENT 1 – NEWTONIAN PHYSICS

Overview of the Component

Questions 5 was the best performing question on the paper and it was the practical analysis skills question, including a semi-log graph and subsequent analysis skills. Questions 2, 3, 4 and 7 provided a mean mark between 70 and 80%. These questions covered the topics of kinematics, dynamics, vibrations and thermodynamics. The comprehension section (question 8) had a mean mark of 60%. This question had the lowest mark on the paper. The QER question that included kinetic theory and Newton's laws had a mean mark of 3.7.

As in previous Component 1 papers, examiners were encouraged by the excellent mathematical skills shown by candidates, particularly when handling equations and when deriving equations with clear algebraic steps. Candidates also had opportunities to demonstrate their extended writing skills, and they did so very well, giving, in many cases, clear and concise explanations.

When describing circular motion, candidates should be encouraged to include the change in velocity or change in direction that is caused by the resultant force. When using the principle of moments, candidates are encouraged to consider whether forces and distances are perpendicular to each other. They may need to resolve forces or calculate horizontal distances in some instances before setting up the equation.

The graphs of PE and KE for an oscillator are often bound by the total mechanical energy in the system. Appreciating that the PE + KE is constant (assuming no energy losses) can be applied to drawing graphs of either of the above. This will help candidates with general shape and symmetry when attempting to draw such graphs. When working with logs, candidates must be accurate with their manipulation of equations using log rules that are provided in the data booklet.

Candidates should continue to spend time learning complete definitions. Stating that the volume of molecules is negligible compared to the size of the container is expected as one of the assumptions of the kinetic theory of gases. Similarly, with the definition of internal energy, reference to particles or molecules, as well as the sum of kinetic energies and potential energies, was required.

Candidates should be encouraged to read the comprehension thoroughly, as in some question parts, it will help them form the required response. The reason we know the luminosity of a standard candle is because there is a relationship between the luminosity and the period for these stars. If we measure the period or variation in intensity, we can then determine its luminosity.

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Comments on individual questions/sections

SECTION A

Q.1 (a) (i) Many candidates were able to successfully substitute into $F = \frac{mv^2}{r}$. Answers of 5556 or 5560 or 5600 were readily seen and awarded the second mark.

(ii) Many candidates realised the driver was incorrect. They were readily describing the car's change in velocity or the car's change in direction. We were looking for more than just accelerating and some candidate responses were too vague. The second mark was for mentioning the resulting force being required. Some candidates answered this from a different perspective, e.g., 'If balanced, no resultant force so constant speed and no change in direction'. The 'accept' response in the mark scheme was seen on a small number of occasions.

(b) Substitution into $p = mv$ was readily seen as was the calculation of time (11.3 seconds). However, some candidates calculated the time for a complete circle. They did not pick up the second mark but there was error carried forward into the 3rd marking point. The last mark was tough. A mean or average force acting in a southerly direction was achieved by more able candidates. In some cases, candidates calculated a change of momentum to be zero. They were still awarded the first and second marking points.

(c) We saw full coverage of all the different bullet points on the mark scheme. There were some lovely answers with well-developed physics. 'The banked track allowed for a component of the normal contact force acting towards the centre of the track' was sometimes seen. As the question includes reference to a similar track, we did not credit answers that included developing larger radii.

Q.2 (a) (i) This question was very well answered. Candidates clearly knew the difference between scalar and vector quantities.

(ii) Identifying the scalar and vector quantities in the paragraph was also well done. They were required to name mass, forward force and air resistance to be awarded credit. We did accept resistive force and treated weight as neutral but only if it was in the vector quantity space. Some answers were a little vague. Naming mass and force was only credited with one mark.

(b) This question was generally well answered. Often, we saw the first two marking points together in one neat equation. There was sometimes confusion regarding whether the bus was moving up or down the slope and this impacted on the acceleration comment for the last mark. Weaker candidates lost a mark here. Some candidates did not use components of force down the slope so were unable to be awarded the first or the second mark. The 3rd and 4th marks were still available with error carried forward. A small number of candidates went down the energy transfer route. Their answer often assumed that the bus had travelled to the top of the slope and therefore didn't directly answer the question.

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(c) There were two possible paths regularly seen in this question. Identifying the components of mg and correctly equating them to T_A and T_B was one method. The second method included calculating the horizontal components of the tension of T_A and T_B then equating them. In a small number of cases a final answer of route three was seen, however, the candidates had initially made an error when calculating components and the $\sqrt{3}$ correspond to T_B / T_A instead of T_A / T_B. They were not awarded credit.

Q.3 (a) This was generally well answered. The first marking point was achieved more readily than the second. Sometimes candidates would omit 'sum of' or 'resultant' or 'net moment'. We were a little generous and square bracketed 'about any point' on this paper. It was noticeable that a small number of candidates only focused on moments and did not mention resultant force.

(b) (i) Candidates were generally able to explain what is meant by the centre of gravity of the bag. Weaker responses included 'mass' instead of 'weight'. For the second marking point an 'uneven distribution of materials in the bag' was very common.

(ii) Candidates found this question demanding. The most common incorrect answer was 57.2 N, where candidates had incorrectly set up the principle of moments equation. These candidates were awarded the first marking point because they showed that they were taking moments about the wheel. To be awarded the second mark candidates needed to have correctly resolved forces or calculated horizontal distances. The alternative responses on the mark scheme were all seen. The third mark was for the correct answer of 38 N.

(iii) Candidates would often use the $\Sigma F = 0$ approach. Some tried applying moments again. There was error carried forward in this question part. The common incorrect answer of 57.2 N in part two meant we regularly saw 139 N. This was awarded full credit with error carried forward.

(c) Most candidates did well on this three-mark question; however, to attain the 3rd mark there did have to be a comment that referred to the coach. Using work done and power was readily seen. Consideration of the angle was occasionally missed. The alternative path included $P = Fv$ and was generally used well.

Q.4 (a) (i) Candidates performed well here. Angular velocity or angular frequency were regularly seen. Angular momentum, frequency and speed of oscillations were not awarded credit.

(ii) Responses here were quite mixed. There was some confusion from some candidates who thought that kg m s^{-2} was equivalent to the joule. Use of square brackets was often consistently used to denote candidates were showing the units of a quantity. Other responses were not quite as clear. We were only looking for one clear algebraic step, and most candidates were able to show that. The use of the 'rad' as an SI unit was an issue for some candidates. We were generous and did not penalise this in the first marking point, however, we were not allowing it in the second marking point. Many candidates

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commented that ½ had no units which was pleasing to see. Some candidates unfortunately did not mention this.

(iii) Candidates coped well with this question. The alternatives on the mark scheme were as regularly used as the original answer. The question references the graph, equation and 0.7 being consistent. A small number of candidates used $\mathrm{KE} = \frac{1}{2}mv^2$ but didn't use the equation given in the question. They were awarded one mark for their calculation of omega, which was then used in the kinetic energy equation.

(iv) There were alternative ways to attempt this equation. The first two examples given in the mark scheme were most regularly seen. $E = \frac{1}{2}kx^2$ was less readily seen. Here candidates had imagined the potential energy graph line needed in the next question and then used this concept.

(b) For the first mark we were looking for the correct shape and the line passing through the origin as well as the points (-0.2, 0.4) and (0.2, 0.4). We were looking for an element of symmetry, and we did regularly see this. If the graphs were too pointy, we did withhold this first mark. When assessing accuracy, we looked for the potential energy graph and kinetic energy graph to cross each other at 0.20 J. We awarded this mark with a 1 square tolerance. Some strong candidates plotted several points based on data from their kinetic energy curve which was pleasing to see. Any discontinuous lines were not awarded credit.

Q.5 (a) Most candidates were able to explain what is meant by free oscillations. Minimalistic answers like 'mass is displaced and released' were enough for credit. We did accept 'a system oscillating without a driving force' or even 'external force'. We didn't think 'undamped oscillations' or 'oscillating at natural frequency' was enough and withheld the mark.

(b) (i) Candidates use of natural logs was generally very good. A small issue that arose on a few occasions involved $\ln A_0 \times \ln e^{-\lambda t}$ instead of the correct + sign.

(ii) Candidates interacted with the results table and '1.10' was regularly seen.

(iii) Generally the point was correctly plotted to within half square and the line was drawn. A small number forgot to plot the point but still drew the line. Any candidate not drawing the line would unfortunately also lose the first marking point in (iv).

(iv) We saw some mixed responses in this question. Big triangles were often seen. Some candidates did think that '$\ln A$' had units. They then went on to convert and often lost a mark because they were out by powers of ten. The gradient of the graph is negative. Its value was given a reasonable tolerance. This second marking point was not always attained. The final marking point was to show that λ was "$-1 \times$ their gradient value". Clear reasoning was needed here. The correct unit was also required. We did not accept a final answer in surd form for this practically based question.

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(c) We saw lots of variation for this 'suggest one improvement question'. Use of slow motion, shorter time intervals, repeats or rerun and means calculated were all very popular. Use of a fiducial marker was also seen. We did accept the use of a larger initial amplitude. We did not award credit for use of an assistant or for a release mechanism, however, these were not regularly seen.

(d) (i) This question involved a synoptic element. We were looking for the time taken for the amplitude to halve. We did not accept 'displacement' in place of 'amplitude'. No credit was awarded for time taken for the oscillations to halve. Some candidates got a little confused. Decreasing by a factor of ½ is in fact multiplying by 2. A small number of candidates gave the definition of half-life in terms of radioactive decay. They were not awarded credit.

(ii) The synoptic element continued in part two. Candidates coped well with this. There was some variation from the mark scheme. The $\frac{ln2}{\lambda}$ was sometimes replaced by $\frac{ln0.5}{-\lambda}$.

Q.6 (a) Candidates recall of the three assumptions of the kinetic theory of ideal gases was generally good. We required complete assumptions for credit. For example, stating the volume of molecules being negligible needed a comparison to the size of the gas or the container. All points on the mark scheme were regularly seen.

(b) This show that question also asked candidates to define any additional symbols used. This was done well by many candidates. The mass of the molecule was sometimes missed, as candidates thought that m was the molar mass. This often didn't allow any further progress onto the second and third marking points. Unfortunately, a small number of candidates who defined n and m correctly forgot to complete the set and define V. For the second mark candidates did not need to state 'total mass' but we needed to be convinced that they knew it was nN_Am. Density being stated for the final mark was often found by implication. It is worth noting that in some cases confusion between upper- and lower-case m meant that marks were withheld.

(c) Top band candidate responses usually included complete explanations of molecular collisions and changes in momentum referencing both Newton's second and third laws. They would include clear reference to multiple collisions on multiple surfaces and hence the pressure. They would then discuss the differences between A and B. This included reference to a smaller mean speed, a smaller rate of change of momentum, less frequent collisions, lower pressure in B. Middle band responses gave a good explanation of pressure but did not mention Newton's Laws or they were simply stated and were not then used to supplement explanations. Their comparison of pressure in A and B was less well developed. Bottom band responses often gained some credit for more basic comments regarding container wall collisions. However, sometimes force and change in momentum references were weak or omitted. There may have been general Newton's laws comments that did not link into any explanation. $P = F / A$ may have been stated but lacked any explanation. There was also not much of a comparison in terms of pressure between A and B. In a very small number of cases the candidate's mark was dropped to the bottom of the band because of poor spelling punctuation and/or grammar.

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Q.7 (a) We were looking for the definition of internal energy on a microscopic level. 'The sum of kinetic energies and potential energies' was seen readily. Reference to 'particles' or 'molecules' was sometimes missed. Generally, candidates answered this question particularly well. Some candidates defined internal energy for an ideal gas and hence left out the reference to potential energy. They were still able to pick up the second mark if particles or molecules were referenced. A small number of candidates tried to define an internal energy through the first law of thermodynamics. They were not awarded credit.

(b) In this 'show that' question candidates found multiple ways to arrive at $U = \frac{3}{2}PV$. Some candidates started with the kinetic energy equation given in the question. Others started from an equation given in the data booklet. $pV = \frac{1}{3}Nm\overline{c^2}$ was a popular starting point. Rearranging this, and clear multiplication by ½, meant they arrived at the desired outcome. There were very good algebraic skills on display throughout. In a small number of cases candidates didn't quite make it clear that $U = E_k$. We did see use of $pV = NKT$ as well as $pV = nRT$ as outlined in the mark scheme.

(c) (i) Candidates coped well with this explanation question. For the second marking point we did not require a calculation. However, some candidates did show ΔU to be -21 J. In a small number of cases, candidates were unable to give the necessary detail to achieve the first two marking points, however, the 3rd marking point was still available. Some candidates tried using $PV = nRT$ but as they made no reference to the first law of thermodynamics, they were unable to gain credit.

(ii) Candidates found many different successful ways to answer this question. The mark scheme shows alternatives where candidates used $U = \frac{3}{2}pV$ or $T = \frac{pV}{nR}$ or $pV = nRT$ between D and A to calculate an n value of 0.01. Finding the correct temperature difference using n = 0.01 was also accepted. In a very small number of cases, candidates calculated the area under the graph to be 50 joules and thought this was equivalent to ΔU. In this instance they had not considered Q and therefore were unable to gain any credit.

(d) This was generally well answered by candidates. We were looking for the internal energy approaching zero, and hence particle motion nearly at or approaching being stationary. We did accept internal energy is zero where we felt candidates had arrived at this temperature. They then had to say that the particles had stopped moving. The second marking point was based on how the candidate had answered the internal energy part of the question.

SECTION B

Q.8 (a) (i) There were a few different approaches that were awarded credit in this 'explain' question. The Hubble constant is the gradient of the Hubble diagram was not regularly seen. More regularly occurring responses involved a link between velocity and distance. If candidates went down this path, we needed to be convinced that they were describing 'speed per distance'. There were some vague muddled

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answers that included ‘rates per second’. These were not awarded credit.

(ii) This question involved a unit conversion and then comparison to a value in the data booklet. Candidates found a couple of approaches using $x = vt$ to calculate the equivalent distance of a light year in metres. Some candidates realised that they could obtain a value for a parsec in metres from the data booklet. Either approach meant an Mpc conversion was required somewhere in this calculation. A small number of candidates divided by 10^6 instead of multiplying. The 3rd marking point was for obtaining a value of 2.37×10^{-18}. Errors in powers of 10 resulted in a one-mark penalty here. A comparison with the Hubble constant was required and comment made. This was a standalone mark and based on the candidate’s previous calculation. The comment would sometimes be as basic as ‘very close’, however, we did see answers referencing a percentage difference between their answer and the book value.

(b) This question was found to be challenging by candidates. We would regularly see responses that included ‘we know its luminosity and by measuring its intensity of the light that reaches the Earth we can calculate the distance’. Candidates were clearly calling upon the inverse square law; however, we were looking for more than this. The reason we know the luminosity is because there is a relationship between the luminosity and the period. This was needed for the first marking point. ‘We measure the period or variation in intensity, and this allows the luminosity to be found’ is what was required for the second mark.

(c) Candidates coped particularly well with this question. Most read the recession velocity from the graph within the tolerance allowed. We saw good use of the doppler equation. We condoned power-slips on the second marking point.

(d) ‘Straight line’ or ‘linear relationship’ through the origin was regularly seen. Some referenced a positive gradient. This was not enough. A small number of candidates were too focused on telling us all they knew about Hubble’s law and did not refer to figure 1 in supporting their answer. We required that the error bars be considered for the final marking point.

(e) This was another question that candidates found challenging. We were looking for the fact that it depends on a theory. The alternative was to say that it was not based on direct measurements of velocity or distance. Candidates were sometimes rather vague with their responses.

(f) For the first marking point to be awarded, candidates needed to inform us where the light was coming from. In weaker responses the implication was that the light originated from the distant galaxy. The second marking point involved an understanding of what bends the light. We were looking for gravity here and many candidates achieved this mark. The third marking point was tougher. Candidates needed to inform us that the light appears to be originating from a disc or a ring. It was not enough to say a ring appears. The alternative was to clearly describe that the distant object is now appearing elsewhere.

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(g) Some candidates produced some lovely answers here. As per mark scheme, dark energy explains that the 'rate of expansion of the universe is increasing' or the 'expansion of the universe is accelerating'. We did not accept that it explains 'the expansion of the universe' as this was too vague.

(h) In this final question part, the student was correct, although we were not holding out for a final comment. A small number of candidates thought that the student was incorrect because you can't go faster than the speed of light. It is worth noting that the question was linked to the diagram, and the diagram does imply that some supernovae are travelling greater than the speed of light because their redshifts are greater than one. Some candidates went a little further than the mark scheme and used the redshift to calculate a speed greater than *c*. A small number of candidates used $v = H_0 D$ for a point above the line. They were awarded one mark only as H_0 would not be suitable for such distant objects.

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PHYSICS

GCE A level

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COMPONENT 2 – ELECTRICITY AND THE UNIVERSE

Overview of the Component

Overall, candidates demonstrated secure knowledge across many areas of the specification, particularly in numerical substitution, standard definitions and familiar equation use. The strongest responses combined accurate physics with clear reasoning, appropriate units, and conclusions that addressed the precise wording of the question. However, in weaker responses, marks were commonly lost through incomplete explanations, weak links between physical principles and final conclusions, errors in unit conversions and insufficient attention to significant figures or uncertainty treatment. Centres should continue to encourage candidates to state conclusions explicitly, particularly when evaluating a named student's statement; to show sufficient algebraic working when deriving or verifying relationships; to use units, powers of ten and significant figures carefully; and to provide enough procedural detail in practical and QER responses to justify the method, including repeated readings, control of variables, graph choice and interpretation of gradients or intercepts. Detailed comments are given below.

Comments on individual questions/sections

Q.1 (a) (i)+(ii) Around half the candidates were able to give a complete explanation for the reading on the meter in terms of electron transfer from the duster to the cap via the polythene rod. Nearly all candidates successfully calculated the number of electrons transferred in (i) and the time for discharge in (ii).

(b) (i) The majority of candidates used the appropriate equation to determine the current in the variable resistor correctly.

(ii) Responses to this part showed secure understanding of the relevant circuit principles. A variety of correct approaches were seen. Many candidates used a resistance-based method, determining the resistance of the thermistor using the resistors in parallel formula, while others used a current-based method to determine the current in the thermistor and then its resistance. In all cases, candidates successfully determined the operating temperature of the thermistor from their resistance values.

(iii) Most candidates gave competent responses, showing sound understanding of potential difference and resistance in parallel and series circuits. Descriptions were often succinct and focused on the effect on potential difference across the series sections of the circuit as temperature changed. In a few cases, candidates did not state explicitly that David's conclusion was incorrect.

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Q.2 (a) (i)+(ii) Nearly all candidates correctly stated that the resolution of the voltmeter was 0.01 V and calculated the percentage uncertainty correctly. In part (ii), responses were more varied, with candidates scoring a range of the marks available. The mean mark was 4 out of 6, demonstrating a good understanding of the physics of dealing with uncertainties, although some common themes highlighted areas of weaker understanding. Most candidates determined the mean energy and the associated absolute and percentage uncertainty in its value, and many also calculated the capacitance successfully. Candidates who lost marks in these calculations usually did so by omitting the power of 10 factor, for example by not taking millijoules into account. A significant number also lost a mark for not doubling the percentage uncertainty in V when finding the total percentage error.

Many candidates failed to gain the final mark because they did not give their final answer and final uncertainty to an appropriate and/or common number of significant figures. The final answer and uncertainty should be consistent with each other and include an appropriate unit.

(b) (i) Very few candidates picked up on the requirement to explain the increase in the tension of the spring as it extended. However, nearly all gained the second mark for stating that, at equilibrium, the tension in the spring was equal to the electrostatic force acting on it.

(ii) I The mean mark for this part was only 1.7 out of 4. Many candidates struggled to link the base units of charge, permittivity and area together to show that the units of the given equation could be expressed in newtons. In most cases, candidates gained one or two marks for providing some of the required units; however, very few were able to combine their units algebraically to obtain the required answer.

II Conversely, the mean mark for this part was 3.6 out of 4, with nearly all candidates able to state Hooke's law and use the definition to determine the extension, x, correctly.

Q.3 (a) Responses to this practical-based QER question were generally sound, although many did not reach the top band because they lacked detail or included misconceptions about the conclusion. Most candidates gave broadly correct descriptions of the expected procedure, including some basic precautions and the reason for stirring, and many described plotting an appropriate graph. Common omissions included not considering the initial resistance of the connecting wires and subtracting this value from subsequent readings, not mentioning parallax considerations, and not considering repeated readings. A significant number of candidates also incorrectly stated that resistance would be directly proportional to temperature in °C, rather than increasing linearly with temperature over the range considered.

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(b) (i)+(ii) Most candidates understood that electrons collide with lattice atoms in normal conductors and that these collisions are absent in superconductors. A significant number lost one mark because they did not explain the transfer of energy in terms of kinetic energy during collisions. In part (ii), most candidates also provided an appropriate cryogen to explain how high-temperature superconductors are kept in their superconducting state.

Q.4 (a) Many candidates understood the concept that ductile materials could be strengthened by mechanisms to inhibit dislocation movement. Many also explained how this was possible in terms of the addition of foreign atoms, additional grain boundaries (or reducing grain size), or by adding further dislocations. Reference to doping, work-hardening or cold-working/quenching was not credited unless explained on the level of particles. A small number of candidates referred to 'planes of atoms sliding over each other', but this was not credited because it describes an incorrect process. Candidates should instead be encouraged to focus on the inhibition of dislocation movement.

(b) (i)+(ii) Nearly all candidates successfully calculated the tension in the brass wire in this synoptic based question (i). The majority of candidates successfully determined the extension using appropriate equations for stress and strain, or by directly using the formula for the Young modulus. Disappointingly, some candidates again lost marks because they used diameter incorrectly instead of radius in their calculations. Nearly all candidates used their value for the extension correctly to determine the elastic potential energy stored. In a few cases, candidates failed to convert mm to m at any point in their working and were deducted one mark.

(iii) The required response needed to reference the different tension (or force) in the wires, concluding with the statement that Ben was wrong. Responses based on different spring constants were not accepted as further detail was required as to what aspect of the spring constant was indeed different.

Q.5 (a) Most candidates drew correct diagrams showing the required electric field lines, including field direction, and equipotential surfaces.

(b) (i) Nearly all candidates gained two marks (out of three) for showing that $V_e \times r$ = constant for at least two points on the graph. One mark was awarded for a valid strategy such as this, a second mark for choosing two pairs of points from the graph, and a third mark for using at least three points and confirming the expected relationship. Answers were accepted regardless of the power of 10 used.

(ii) The mean mark for this part was 1.9 out of 2, showing that nearly all candidates used the equation for electric potential correctly to determine the size of the charge.

(iii) I Most candidates substituted the required values into the equation for electric field strength correctly to show that the field strength was approximately 200 kN C^{-1}.

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II Many candidates made good attempts at drawing appropriate tangents and succeeded in showing that the gradient was consistent with their answer to the previous question. A minority read the value of V at 0.5 m and determined E using V/r, which was accepted.

(c) (i)+(ii) There were good attempts here, with many candidates succeeding in calculating the required acceleration. Common difficulties that prevented candidates from gaining full marks included mistakenly using the mass of an electron rather than that of a proton, and/or using a charge of +1 coulomb rather than 1.6×10^{-19} C. Most candidates understood that field strength, or force, decreased with increasing distance in part (ii); however, a significant minority failed to state whether Poppy's conclusion was correct and therefore did not gain the mark.

Q.6 (a) (i) The mean mark for these familiar definitions of Kepler's first and second laws was 1.3 out of 2. Common areas where marks were not awarded included omitting the phrase "with the Sun, (or star), at a focus" in the first law, and omitting the phrase "line from the planet to the Sun, or star" in the second law.

(ii) Nearly all candidates gave clear and concise algebraic proofs of the equation for Kepler's 3rd law. The mean mark of this part was 2.8 out of 3.

(b) (i)-(iv) Many candidates used the appropriate equation confidently to determine the separation of the stars. In part (ii), candidates often used an appropriate ratio relationship to show the fractional distance from the white dwarf to the centre of mass of the system. Most candidates successfully determined the orbital speed of the white dwarf in part (iii); however, a significant minority made errors when converting the period from hours to seconds, often introducing a 24-hour factor incorrectly. Candidates' use of the Doppler formula showed improvement compared with previous years. Most used the formula correctly to show that the given redshift was consistent with their answer to part (iii), and candidates who answered part (iii) incorrectly could still gain credit in part (iv) if their calculations were carried out correctly.

(v) The mean mark for this part was 1.1 out of 2, with many candidates failing to gain credit as they did not link the expected smaller Doppler shift to the speed of the neutron star. Many, instead, referred to the mass of the star or its radius of orbit, which does not directly link to wavelength shift.

Q.7 (a)+(b) The majority of candidates were able to give a clear and correct definition for gravitational field strength. Nearly all candidates were able to calculate the mass of Pluto.

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(c) Many candidates made good attempts at applying the conservation of energy correctly to determine the height reached by the spacecraft. Those who lost marks often did so because of confused signs for the potential, or potential energies, at the surface and at the height h. This led to incorrect intermediate answers for energy and/or total height, which affected their ability to show that the height reached was approximately 80 km. Nevertheless, the response to this question was an improvement on a similar question set in the previous series, with many candidates displaying a good understanding of both the physics required, and the mathematics needed to answer the question.

(d) (i)+(ii) These two parts saw the fewest attempts, with about 85% attempting part (i) and only 66% attempting part (ii). In part (i), candidates who attempted the question generally showed a good understanding of conservation of energy in simple terms and calculated the height reached using the assumption given. In part (ii), candidates should be reminded that, even if they were unable to calculate a value for h from part (c), the question was structured as a "show that" question so that the 80 km value given in part (c) could be carried forward if needed. Many candidates appeared not to recognise that they could use the 80 km value for this relatively straightforward numerical question.

(e) There were many good attempts at this issues-based question, with the majority of candidates able to calculate the mass of Jupiter correctly and then use the information given in the proposal to show clearly that Pluto should not be considered a planet.

Q.8 (a)+(b) Nearly all candidates calculated the critical density of the universe correctly. Most candidates understood that the expansion of the universe would slow down (or equivalent) if the critical density was greater than the accepted value.

(c) (i)+(ii) Many candidates understood the relationship between the age of the universe and the Hubble constant and used the Hubble constant to determine the age of the universe in years. In part (ii), most candidates gave a logical argument relating the size of the universe to time, given that the expansion was higher in the past as stated in the question. Many, but not all, reached the correct conclusion that this would lead to the universe being younger.

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PHYSICS

GCE A level

Summer 2026

COMPONENT 3 – LIGHT, NUCLEI AND OPTIONS

Overview of the Component

The general standard of performance of candidates was superb and nearly identical this year compared with last year – from a mean last year of 69% to a mean this year of 68%. This was a difficult paper, but the vast majority of candidates coped well. The statistics indicate that the paper, despite its high mean mark, provided good differentiation for the cohort of applicants. There was no evidence of candidates struggling with time restrictions again this year – 99.8% of candidates attempted question 8(a) and numbers attempting later parts of the options indicate little or no decrease.

Q4 provided the lowest mean mark this year (54%) and is covered extensively in the exemplars available for this component. There were some difficult explanations in this question on the photoelectric effect and spectra. Q8 (magnetism and induction) also provided quite a low mean mark (58%) with the last two question parts proving to be difficult. These are also covered in the exemplars.

Comments on individual questions/sections

SECTION A

Q.1 Quite well answered. The explanation of a progressive wave was generally known. The 6 mark QER was well done. The most common omission in the QER was not mentioning the observations for unpolarised or partially polarised light.

Q.2 For such a tough question involving error bars and uncertainties, the mean mark here is exceptionally high. Parts (d)(i) and (d)(ii) caused more problems and these are discussed in the exemplars. The graphical skills are particularly good. It should be noted that the slit separation is measured from the centre of the slits. Also, once maximum and minimum gradients have been calculated, candidates should not then go back to the table and put values into the equation to obtain the wavelength.

Q.3 Parts (a) and (c) were very well answered. Even though part (a) was meant to aid part (b). The derivation of Snell's Law proved difficult and is discussed in the exemplars. The most important point here is to notice the two triangles with a common hypotenuse along the boundary.

Q.4 The photon energies were generally well known (or sometimes calculated). The explanations of parts (b), (c) and (d) were not as good and various details were missing. Candidates should be able to describe the principles of emission and absorption spectra in more detail. These are discussed in the exemplars. The ionisation energy (e) was well understood but many of the calculations in part (f) were incomplete.

Q.5 This was quite an unusual lasers question and there are many difficult aspects to this laser question but the mean mark is impressively high. Parts (b) and (e) were difficult and these are discussed in the exemplars. The main point missing in part (b) was that for equilibrium the rate of electrons entering the metastable level must be equal

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to the rate of electrons leaving the level. In part (e), most candidates realised that this was to do with the equation: $A = \lambda N$ but they could not distinguish clearly between the number of electrons in the level (N) and the rate of decay (dropping) of these electrons (A).

Q.6 This question was a standard radioactivity question leading to the Rutherford model of the atom which then finished with the "issues" question. All three radioactivity parts were very well done. The synoptic calculations relating to the Rutherford atom caused a few more problems, probably because they were unexpected. In part (d)(iii), candidates should have read the question more carefully. They were asked to reference their previous answers but most candidates failed to do this.

Q.7 As you can see from the mean mark, this question was brilliantly answered. The part that caused most problems here was identifying the force (e). Many candidates seemed to think that this was an electromagnetic interaction because all the quarks are charged. However, with all particles being hadrons and no change in quark flavour and no photon, this is clearly a strong force interaction.

Q.8 Parts (a) and b(i) provided no difficulties to nearly all candidates. This was to be expected because they required careful substitution into one equation only. Parts (b)(ii) and (c) were considerably more challenging and are discussed in the exemplars. Part (b)(ii) led to many pointless calculations when the answer to those who could see clearly was simply zero. Part (c) was far more testing. Even those candidates who calculated the time and the current correctly most often failed to plot the graph correctly.

SECTION B

OPTION A – ALTERNATING CURRENTS (Question 9)

(a) (i)+(ii) Answered well with candidates selecting the relevant information from the diagram and using the relevant equations to calculate the values of the capacitor and inductor.

(iii) Candidates were familiar with phase diagrams and were able to sketch the phase of the pd of the three components, although some incorrectly labelled the capacitor as leading and the inductor lagging. In II candidates were generally able to calculate the resultant rms pd using Pythagoras and many used trigonometry correctly to calculate the phase angle. However, a significant number of candidates did not indicate the direction of the angle and therefore were not awarded the 2nd mark. Those who stated the direction or showed it correctly on the diagram were awarded the mark.

(b) (i)+(ii) Candidates were familiar with the derivation of the resonance frequency equation and were able to show this in clear steps. Part (ii) was answered well with candidates able to calculate the resonance frequency of the circuit.

(c) Most candidates demonstrated an understanding that changing the value of the resistor did not affect the resonance frequency, both stating this and showing it on the graph. Most candidates were aware that the lower resistor value gave a higher current, but not all attempted to calculate this. Some candidates calculated the current correctly and this was awarded from the peak value plotted on the graph if no calculation was shown. Although many candidates indicated that the smaller resistance would increase the Q factor or give a shaper curve, this was not always shown on the graph.

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OPTION B – MEDICAL PHYSICS (Question 10)

(a) (i) The calculation of the minimum wavelength was generally well done with most candidates gaining the full 3 marks available, however the sketch graph was not as well done. Some candidates started and finished the graph at zero on the x-axis. Some candidates failed to label points on their graph, and often the graph was not skewed correctly.

(ii)+(ii) Generally, well done with many candidates showing good mathematical skills.

(b) (i) Most candidates realised that an alternating voltage was needed, some talked about an alternating current which was also accepted. Not as many went on to state that this was connected to a piezoelectric crystal which vibrated at the same frequency as the voltage. A minority talked about the crystal receiving reflected ultrasound. This was not required and was treated as neutral.

(ii) The Doppler equation was correctly chosen by the vast majority of candidates. The main problems then came in converting and applying consistent units. The more successful candidates converted all into metres so obtaining an answer in $\mathrm{m\,s^{-1}}$.

(c) Almost all candidates realised that MRI scans used radio waves so obtaining the first mark. The number obtaining the second mark however, was more varied they needed to state what the radio waves were affecting i.e. hydrogen atoms or nuclei or protons and also what it did, cause them to flip, change orientation etc.

(d) It was good to see that the vast majority of candidates tried analysing each of the imaging techniques available separately. The majority of candidates correctly stated that X- rays were not suitable for imaging soft tissue, similarly for CT scans. Some realised tracers would not be absorbed well by ligaments and while ultrasound would give an image, MRI would be much clearer and better. A number of candidates talked about cost (this is not a priority for doctors when treating patients) and so it was treated as neutral.

OPTION C – THE PHYSICS OF SPORTS (Question 11)

Most candidates achieved high scores across the paper, but some responses exposed key conceptual gaps. Specifically, these included a lack of precision in defining moment of inertia, incomplete analysis when applying the conservation of angular momentum to a gymnast's entire motion, and a tendency to provide vague qualitative conclusions in evaluations.

(a) (i) This was high scoring, though lacked precision in written descriptions. Most candidates successfully wrote down a defining equation (such as $I = \sum m r^2$) and defined the individual variables. However, a frequent error was the loose definition of the variable r. Candidates often referred to it simply as "the radius" or "distance," which was not accepted. To secure full credit, candidates needed to explicitly state that r represents the **distance from the axis of rotation** (though "radius from the axis of rotation" was accepted as a valid alternative).

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(ii) Candidates often gained partial credit but struggled to construct a complete, chronological explanation of the motion. Most candidates successfully deduced that pulling her limbs in would cause her angular velocity to increase by a factor of 3 when her moment of inertia reduced to $\frac{1}{3}$ of its original value. However, some candidates failed to explicitly state and explain that this inverse relationship is a direct consequence of the **Principle of Conservation of Angular Momentum** (acting in the absence of an external torque). Furthermore, because the question required candidates to analyse the *entire* motion, many lost marks by failing to mention boundary conditions—specifically, that the initial angular velocity starts from rest (or zero) at the push-off and the final angular velocity must reduce to zero upon landing.

(b) Most candidates secured two marks, but full marks (4 marks) were only achieved by the more able candidates. A vast majority easily calculated the value of 0.6 by dividing the rebound speed by the initial speed $(9/15)$. To obtain the remaining marks, candidates were required to provide and understanding of the coefficient of restitution: the ratio of the relative speed of separation to the relative speed of approach or candidates had to state the fundamental physical assumption underpinning the calculation: that the goalpost is rigidly fixed and does not move/recoil upon impact. There was a bizarre array of irrelevant assumptions, with a surprising number of candidates citing assumptions from the kinetic theory of gases, which were entirely irrelevant.

(c) (i) Generally well answered, showing high numerical competence. While most candidates scored well, the primary mathematical pitfalls occurred in two areas. Calculating the moment of inertia **(I):** Candidates struggled to correctly apply the sphere formula $I = \frac{2}{3}mr^2$, often using the diameter of 0.21 m directly instead of halving it to find the radius ($r = 0.105$ m). Angular velocity conversion (ω)**:** A significant number of candidates failed to properly convert the frequency of 12 revolutions per second into angular velocity in radians per second ($\omega = 2\pi f = 24\pi$ rad s^{-1}).

(ii) Well answered overall, with most candidates correctly drawing force vectors. The most frequent mistake was pointing the dynamic "lift" force vector upwards instead of downwards. Because the ball has topspin (where the air flows faster over the bottom surface than the top), the Bernoulli-induced pressure difference creates a downward pressure force. Additionally, a small but notable portion of candidates focused so heavily on the aerodynamic forces that they completely forgot to draw and label the downward weight (mg) of the ball.

(iii) Strong quantitative work, though qualitative conclusions were frequently weak. This calculation was executed highly effectively, with a large proportion of candidates securing 4 out of the 5 available marks by correctly applying Bernoulli's principle to find the pressure difference (ΔP) and subsequently the net force ($F = \Delta P \times A$). However, the final evaluation mark was frequently dropped. Vague conclusions such as "it will affect the flight of the ball" were not credited. Candidates were expected to explicitly describe *how* the flight is affected—namely, that the downward force causes the ball to dip or dive more sharply towards the ground than it would under gravity alone.

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OPTION D – ENERGY AND THE ENVIRONMENT (Question 12)

(a) Most candidates calculated the power radiated correctly but some forgot to state the name of the law used or thought it was the inverse square law or Wein's law. A small number of candidates used πr^2 instead of $4\pi r^2$for the surface area of the star.

(b) (i) Although candidates showed an understanding of thermal equilibrium, this was not always expressed clearly enough to be credited. Reference to zero heat flow was deemed not enough. An understanding of net heat flow was required.

(ii) Explanations linking CO_2 levels with an increase in mean global temperature were often vague, with candidates referring to reflected rays instead of an explanation of radiation being absorbed and re-emitted. Despite thermal equilibrium being introduced in part (i), candidates were not linking the energy in and out to the rise in temperature.

(c) This was well answered with candidates familiar with how human activity is contributing to the increase in CO_2 in the atmosphere and ways of reducing this. On a few occasions candidate responses were a little vague. Use of electric vehicles will only help if the electricity has come from renewable sources such as solar or wind.

(d) (i) Many candidates were able to recall the Archimedes principle but some statements were incomplete and therefore were not awarded the mark.

(ii) Lots of candidates were able to calculate the rise due to melting land ice. Weaker candidates were able to calculate the mass of the ice. Not all candidates realised that the mass of the melted ice was equal to the mass of the water added to the sea. Some candidates tried a ratio technique but getting the 917 and the 1000 mixed up meant they received little credit. A small number of candidates did not give a clear comparison with the 4 cm rise and hence were not awarded the 5th marking point. There were some powers of 10 errors. These incurred a 1-mark penalty.

(e) (i) Candidates often showed good use of the thermal conductivity equation.

(ii) This was found to be far more demanding for candidates. Incorrect responses included calculating a heat flow for the new setup and incorrectly adding it to the previous answer. Some added K values whilst others subtracted them. Both methods were incorrect. A good number of candidates successfully calculated the temperature at the boundary. A similar approach involved setting up a pair of equations with ΔT_v and ΔT_c included. Other alternative methods included calculations of U values and thermal resistances. Many candidates found it challenging to set up the required equation from the information in the diagram.

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PHYSICS

GCE A level

Summer 2026

PRACTICAL ENDORSEMENT

Overview of the Component

The centres observed during the academic year demonstrated a good understanding of the requirements of Practical Endorsement. The following is a summary of observations made from the monitoring reports together with a brief commentary:

- Suitable plans of practical work were prepared by the departments and used by all members of teaching staff. These plans were either incorporated into the Scheme of Work or kept as a separate document. Both methods were considered acceptable. Good plans allowed for the development of skills within Practical Endorsement and ensured all elements of each CPAC were covered. They detailed the CPAC to be assessed in each practical, the proposed time in the teaching year where it would be carried out and provided evidence that the centre would cover all the apparatus and techniques identified in Appendix A part (c) of the specification.
  Centres are reminded that this plan must be available to the monitor during visits.
- Candidates were informed of the CPAC assessed in the introduction of the observed practicals. In many cases, the candidate worksheets also identified the CPAC that would be assessed in the class, further reinforcing what the teacher was looking for.
  This is all good practice. Candidates should know what you are assessing and how this will be judged.
- There was a good use made of technology to record and/or process data in a number of centres.
- Accurate and up-to-date Teacher and Candidate Records were maintained by all the centres visited. These were recorded in an Excel Spreadsheet, often showing the CPAC element (e.g. CPAC3(a)) achieved in each practical.
  It is appropriate to remind centres that although it is not necessary to record CPAC to the detail of each element in the spreadsheet, candidates must evidence competence of all aspects of each CPAC. Monitors will check for this in a visit. Centres are strongly advised to annotate the candidate work showing the element achieved (e.g. CPAC 4(a) or CPAC 4(a&b)).
- There was evidence of feedback to candidates. Feedback was given either verbally or in writing.
  This is good practice. Practical Endorsement is intended to help candidates develop good practical skills, and feedback helps complete the learning loop.
- There was evidence of standardisation across **all** subject teachers when Practical Endorsement was delivered by a team of teachers. A variety of evidence was seen, including departmental minutes showing time was given to standardisation and documentation showing cross-marking between teachers on selected work.
  Standardisation is a requirement of Practical Endorsement and is recorded in the monitor's report of the centre. It must be implemented for a centre to pass the monitoring visit.
- In some centres, descriptors of minimum standards necessary to achieve a CPAC in a practical were available to all teachers on the course. This is judged good practice and is particularly helpful in large departments where there are many teachers of the subject.
  See for example, CPAC Pen Portraits on the EDUQAS website.

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Comments on individual questions/sections

Assessment of Practical Endorsement

Centres should ensure candidates pass the Practical Endorsement 'by consistently and routinely' meeting the criteria. Candidates don't need to achieve a CPAC every time, but they should show skill development throughout the course. Evidence of passing each CPAC statement should increase, especially towards the end. Assessment plans must provide opportunities for candidates to demonstrate progress.

Some practical work will likely be done in small groups. When used for assessment, each candidate must provide evidence of meeting the criteria independently. Centres should ensure that group work allows for individual performance to be assessed.

Notes on assessment of CPAC

Once again, the Monitor struggles to add to previous comments. Centres should review the following comments closely to meet the expectations of PE.

It is important to set high expectations for PE early in the course. You can afford to set your standards relatively high for each CPAC; you can always relax later in the course. Be fussy about what you expect. Make sure candidates know what is expected, what fails to reach the standard, why it fails and what they need to do next time to meet the standard.

CPAC 1

This CPAC assesses the candidate's ability to follow written instructions accurately. The monitor will respect the judgment of the teacher unless there is clear evidence of incorrect assessment.

If a teacher needs to intervene or interpret instructions for a candidate, then this CPAC should not be awarded.

CPAC 2

Your plan should show you know where and when you are going to assess **each element** of this CPAC. This CPAC involves higher-level skills and requires careful planning to ensure sufficient development time before assessment. Generally, the monitors find that centres find sufficient and suitable opportunities in physics to assess each element of this CPAC without too much trouble.

It is also important that sufficient time is given to candidates to develop the necessary skills before assessment occurs. Generally, we do not expect to see this CPAC assessed in the first two terms of an A level course. However, we do expect to see evidence of some assessment of this criterion by the end of the first year of the A level course. This skill may be evidenced by a candidate planning to carry out a procedure and then adapting their approach, as necessary. It is **not** necessary to assess every element of CPAC 2 each time this CPAC is assessed. However, it is a requirement that each element of CPAC 2 is met during the course. If you are monitored, the monitor will look at the coverage of each element.

Physics gives many good opportunities to assess this criterion, and generally centres did not disappoint! One often used technique involved requiring candidates to develop a method by using equipment in a tray and applying the theory behind the method to measure some parameter/constant (e.g. acceleration due to gravity).

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CPAC 3

Please select practicals where there are some significant safety issues for candidates to comment upon when assessing this CPAC. Do **not** use practical work to assess this where hazards are minimal. It is not necessary to assess this skill every time a practical is completed.

CPAC3(a) This is best evidenced by a simple written risk assessment. Centres are advised that candidates are first instructed in what makes a good risk assessment. There can be some variation in the quality of risk assessments accepted by centres. Make sure that you have suitable criteria for accepting risk assessments that all members of teaching staff understand.

It is expected that the candidate should identify the most significant hazards and risks and have considered suitable controls. If this is not done, do not award the risk assessment.

CPAC3(b) Direct observations of candidates working safely by the teacher working during practical sessions or fieldwork will be accepted by the monitor for 3(b). Please avoid awarding this CPAC for simple attendance of the lesson. Did the candidate follow the risk assessment and work safely? If you needed to 'remind' the candidate about safe working practice, then do not award the criterion.

If this is assessed in the observed practical by the monitor, then please expect questions about the candidate's performance from the monitor.

CPAC 4

This CPAC deals with both qualitative and quantitative data. There are multiple opportunities in physics to both develop and assess this skill.

CPAC4(a) making accurate observations.

Ensure that the following points are borne in mind when assessing this CPAC:

- Observations should be made directly into candidate practical books or into a spreadsheet. Do not award this CPAC if the candidate writes results onto scraps of paper and copies them up later.
- Do not award this CPAC if you provide a template table to the candidates for recording results. Where necessary, remove table templates to allow candidates to construct their own.
- The tables which candidates construct **must** have appropriate headings and units, where relevant. The units must be written in the table column head and not in the body of the table. If units are missing, do **not** award criteria.

CPAC4(b) obtaining accurate, precise and sufficient data .....

Please carefully check candidates' data.

- Is the data recorded to appropriate precision? If data readings are not consistently recorded by a candidate, then do **not** award the criteria. Make sure that recordings are to the correct number of decimal places. Please be careful if candidates record into a spreadsheet. The spreadsheet cells should be set up to show the precision to which the data is measured.
  Be particularly careful to check that candidates are recording readings from an instrument correctly. You should be walking around the classroom checking on candidates as they record values.

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- Is there sufficient data? Is the data what you expect? Please set suitable standards at the beginning of the course. It does not matter if a candidate did not always achieve the criterion.

CPAC 5

This important higher-level skill should be assessed from early in the course. There is no shortage of suitable assessment opportunities in physics. CPAC 5 has two elements:

(a) Uses appropriate software and/or tools to process data, carry out research and report findings.
(b) Sources of information are cited, demonstrating that research has taken place, supporting planning and conclusions.

CPAC5(a) There should be evidence of candidates processing data using graphs and calculations. Centres should require candidates to use software (e.g. Excel, graphical programmes, programmable calculators) to process data and /or generate graphs in at least some practical work. There are many opportunities to do this in physics, and it is expected that candidates will demonstrate familiarity with using Excel or similar applications. Although this is not a requirement, examples were also seen of centres using Python to code for tabulating and graphing. It is encouraging to see centres challenging their candidates with these skills.

Ensure graphs drawn on paper or with Excel meet the minimum standards expected before awarding this criterion i.e. have a title, labelled axes, correctly plotted points, and an appropriate scale. Do not accept sloppy work.

Processing data also involves carrying out calculations. This may involve transformation of data using mathematical equations etc. Once again, suitable computational methods may be used (e.g. coding, spreadsheets, programmable calculators).

CPAC5(a) also includes ‘carry out research and report findings’. The report does not need to be long; it may simply be the conclusion they draw from their data. However, it is not appropriate to award this CPAC for a one-word answer. A conclusion requires a reasoned response to the data observed. The research may be internet or book-based. Any reference used should be properly cited (see CPAC5(b)).

CPAC5(b) This is not a difficult CPAC to evidence, but it is still often the most poorly evidenced skill in candidate work. Candidates must understand why this is an important skill to develop and the consequences of failing to do this in HE. Please stress to candidates why referencing is an important skill.

Just a few centres are to be commended for having candidates demonstrating referencing on multiple occasions, with some requiring the Harvard System (which exceeds our requirements for this CPAC).

Please try to get candidates in the habit of evidencing research by giving references every time they source information. This should happen from **early** in the course. Make it become second nature to candidates. The information referenced may be data or a quote; the information may come from a textbook, journal, website EDUQAS data sheet.

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Summary

- Successful delivery of Practical Endorsement needs careful thought and planning. Make sure that there are ample opportunities for candidates to evidence all elements of each CPAC statement over the two years of the course.
- Ensure that candidates are clearly informed which CPAC is assessed in a particular practical session and they understand what is required to succeed.
- Give suitable feedback to candidates so that they can improve their skills.
- Make sure that candidates are informed whether they have achieved Practical Endorsement before the outcomes are submitted to Eduqas in accordance with JCQ requirements.
- Finally, make Practical Endorsement a servant of the subject. Use Practical Endorsement as part of an assessment for learning strategy. Do not let it become an end in itself.

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Our friendly subject team is on hand to support you between 8.30am and 5.00pm, Monday to Friday.
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