Course report 2025

Higher Physics

This report provides information on candidates' performance. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report is intended to be constructive and informative, and to promote better understanding. You should read the report with the published assessment documents and marking instructions.

We compiled the statistics in this report before we completed the 2025 appeals process.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2024: 8,064

Number of resulted entries in 2025: 8,561

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

Course award	Number of candidates	Percentage	Cumulative percentage	Minimum mark required
A	2,368	27.7	27.7	100
B	2,124	24.8	52.5	84
C	1,818	21.2	73.7	69
D	1,341	15.7	89.4	53
No award	910	10.6	100	Not applicable

We have not applied rounding to these statistics.

You can read the general commentary on grade boundaries in the appendix.

In this report:

- ‘most’ means greater than or equal to 70%
- ‘many’ means 50% to 69%
- ‘some’ means 25% to 49%
- ‘a few’ means less than 25%

You can find statistical reports on the statistics and information page of our website.

Section 1: comments on the assessment

Question papers

Feedback from teachers, lecturers, and candidates indicated that the papers were fair and accessible.

Question paper 1 was more demanding than expected, and the grade boundaries were adjusted to reflect this.

Question paper 2 performed largely as expected.

However, questions 9(a) and 9(c) were considered not to have functioned wholly as intended.

In light of this, the grade boundaries were adjusted to reflect this.

Some candidates were unable to answer questions that related to practical work, including questions related to particular experiments detailed in the Higher Physics Course Specification, which is available on the Higher Physics subject page of our website. While it was clear that some candidates had participated in a range of practical work, it appeared that others had little or no experience of practical work and had therefore not developed the necessary knowledge and skills.

Candidates continued to find questions testing recall of facts and definitions challenging.

A number of markers commented on the standard of handwriting of a large number of candidates. In some cases, the handwriting made it very difficult for the marker to interpret the candidate's responses.

In questions requiring a specific number of responses, some candidates gave more than the number required where some may have been correct and others were incorrect. This can lead to situations where candidates were not awarded the maximum marks in a question, as general marking principle 21 is applied to these responses (see Physics: general marking principles, available on the Higher Physics subject page).

Assignment

The assignment performed in line with expectations, with the marks awarded aligning closely with performance in both 2019 and 2024.

No adjustments were made to grade boundaries for this part of the assessment.

Section 2: comments on candidate performance

Areas that candidates performed well in

Question paper 1

Question 1	Many candidates calculated the speed of the car correctly.
Question 3	Most candidates calculated the acceleration of the trolley correctly.
Question 5	Most candidates calculated the maximum speed of the object correctly.
Question 8	Many candidates calculated the length of the tunnel in the frame of reference of the protons correctly.
Question 9	Many candidates identified which statements concerning cosmic microwave background radiation were correct.
Question 10	Many candidates calculated the speed of the electron at the positive plate correctly.
Question 11	Many candidates identified the correct direction of the force exerted on the proton by the magnetic field.
Question 12	Most candidates identified the alpha particle correctly.
Question 13	Most candidates calculated the distance for the irradiance stated in the question correctly.
Question 18	Many candidates identified the correct speed, wavelength, and frequency of the light in the substance.

Question 19	Most candidates calculated the total resistance of the network correctly.
Question 21	Many candidates calculated the EMF of the cell and the reading on the voltmeter correctly.
Question 24	Most candidates calculated the mean and the approximate random uncertainty correctly.
Question 25	Most candidates calculated the radius of the black hole correctly, using the given relationship and data.

Question paper 2

Question 1(a)(i)	Many candidates stated the correct definition for an acceleration of 1.45 m s^{-2}.
Question 1(a)(ii)	Most candidates calculated the distance travelled by the camera mount and camera correctly.
Question 2(b)	Many candidates calculated the correct velocity of vehicle 2 immediately after the collision. Among those that did not, some did not take into account the vector nature of the velocities.
Question 2(c)	Many candidates showed that the collision was inelastic.
Question 2(d)(i)	Many candidates calculated the speed of the vehicle correctly.
Question 2(d)(ii)	Many candidates were able to explain, in terms of wavefronts, why the frequency of sound detected by the microphone was greater than the frequency of the sound emitted by the buzzer. A number of candidates used a diagram as part of their explanation, which made it clearer.

Question 2(d)(iii)	Many candidates described a suitable way that the Doppler effect could be made more obvious to the student.
Question 3 and 13	The open-ended questions performed very much as they have done in previous exams. Answers for both ranged from high quality to low quality. These questions are intended to be demanding.
Question 4(a)	Most candidates could identify the effect as time dilation. Markers noted that a significant number of candidates did not spell dilation correctly, with 'dilatation' being a common error. However, allowance was made if the meaning of the misspelled term was clear.
Question 4(b)	Most candidates calculated the measured time interval correctly.
Question 4(c)	Most candidates stated that the student was incorrect, and many were able to justify their statement.
Question 5(a)	Many candidates compared the temperature of the stars correctly, in terms of orders of magnitude.
Question 5(b)(i)	Many candidates drew a curve that had a lower peak wavelength, but fewer candidates drew a curve that had a higher energy emitted per second per unit area at all wavelengths.
Question 5(c)(i)	Most candidates calculated the gravitational force between planet A and star 1 correctly.
Question 5(c)(ii)	Many candidates stated that the gravitational force of attraction between planet B and star 1 was less than that calculated in (c)(i). However, only some justified their statement appropriately. Some candidates justified their statement by showing an appropriate calculation.

Question 5(c)(iii)	Many candidates showed that the transit time for planet A was shorter than that for planet B. However, few showed an appropriate dip in the brightness. The most common error was to show the initial brightness as being less than that observed for planet A.
Question 6(a)(ii)	Most candidates determined the energy released during the decay correctly.
Question 6(b)(i)	Many candidates identified the correct element represented by X.
Question 6(c)(i)	Many candidates explained correctly what is meant by the term ‘fundamental particle’.
Question 6(c)(ii)	Most candidates stated correctly that baryons are composed of three quarks.
Question 6(c)(iii)	Many candidates determined the correct charge of a strange quark.
Question 7(a)	Many candidates stated an acceptable meaning of the term ‘irradiance’.
Question 7(b)	Most candidates used all the data to establish the relationship as required. However, some candidates, having used the data correctly, did not state the relationship between I and d.
Question 7(d)(i)	Many candidates determined the power of the laser beam. However, some candidates did not calculate the area of the circle produced by the beam correctly.
Question 8(b)(ii)	Many candidates calculated the maximum kinetic energy of an electron correctly.
Question 8(b)(iii)	Many candidates stated that moving the ultraviolet lamp further from the metal plate would have no effect on the

	maximum kinetic energy of an emitted electron. However, few could give an appropriate justification for their statement.
Question 9(b)	Many candidates calculated the angle θ. However, some did not convert correctly between lines per millimetre and lines per metre.
Question 10(b)(i)	Most candidates stated the correct wavelength of the blue-green spectral line by selecting the information from the data sheet.
Question 10(b)(ii)	Most candidates calculated the correct frequency of this spectral line.
Question 10(b)(iii)(A)	Having calculated the frequency of the spectral line, many candidates were then able to calculate the energy of the photon involved in the transition.
Question 10(c)(i)	Many candidates determined the recessional velocity of the galaxy correctly.
Question 10(d)	Many candidates identified that dark energy is thought to be responsible for the accelerating rate of expansion of the Universe.
Question 11(a)	Many candidates determined the resistance of resistor R correctly.
Question 11(b)	Many candidates showed that the value of frequency was 50 Hz. However, some did not show where the value of the period came from and so could not access all the marks.
Question 12(b)(ii)	Most candidates calculated the charge stored on the capacitor correctly.

Question 12(b)(iii)	Most candidates calculated the capacitance of the capacitor correctly.
Question 14(a)(i)	Many candidates drew a graph from the data that had suitable scales and labels. Many plotted the points correctly. However, few drew an appropriate line of best fit. Some candidates forced the line through the origin and then identified the systematic uncertainty in part (b) as being identified because the line did not pass through the origin.

Assignment

1. An aim that describes clearly the purpose of the investigation

Most candidates were able to state an aim that described clearly the purpose of their investigation. For the few candidates who did not achieve this mark, this was usually because their aim lacked specificity.

2. An account of physics relevant to the aim of the investigation

Many candidates were able to demonstrate at least a reasonable understanding of the physics relevant to their investigation. There were a few instances where candidates did assignments on topics that were either at National 5 level or lower, or experiments that were more suited to an Advanced Higher project. In the case of the former, candidates often struggled to include any physics that was at Higher level. In the case of the latter, it was often evident that the candidates did not understand the physics behind the experiments. Centres must make sure that experiments are appropriate for Higher Physics.

3a. A brief summary of the approach(es) used to collect experimental data

Many candidates were able to summarise the approach(es) they used appropriately. The most common reason for candidates not attaining this mark was that they did not summarise the method and instead gave a detailed, often step-by-step, description. Others gave overly brief summaries that did not include the important details of all the measuring instruments used.

3b. Sufficient raw data from the candidate's experiment

Most candidates included sufficient raw data from their experiment. Where candidates did two experiments, at least one met the criteria for this mark to be awarded.

3d. Data relevant to the experiment from an internet/literature source or data relevant to the aim of the investigation from a second experiment

Most candidates included either data relevant to their experiment from an internet or literature source or data relevant to their aim from a second experiment. For the few candidates who did not achieve this mark, it tended to be because the data they included from an internet or literature source was not relevant to their experiment. For example, they included a data book value for a constant rather than including data that could be compared to their own experimental data. A number of candidates included internet graphs that did not include data. Where a candidate's aim was to determine a value or a constant, these graphs were not awarded the mark for this section as they did not allow a value to be determined.

4a. The axes of the graph have suitable scales

Most candidates were able to produce graphs that had suitable scales.

4b. The axes of the graph have suitable labels and units

Most candidates were able to produce graphs that had suitable labels and units.

5. Scale reading and random uncertainties

Most candidates were able to give either appropriate scale reading uncertainties or random uncertainties. However, only some candidates were able to give both. It was quite common for the scale reading uncertainties being quoted not to match the level of precision quoted for the measurements. For example, measurements quoted to 0.1 of a division, but scale reading uncertainty quoted as 0.5 of a division. Some candidates included a scale reading uncertainty for one of their measured quantities, but not for all of them.

9. A clear and concise report with an informative title

Most candidates produced a clear and concise report, with an informative title.

Areas that candidates found demanding

Question paper 1

Question 2	Only some candidates identified the correct acceleration-time graph. This might have been due to candidates not reading the question carefully enough, as some selected the option that showed the line for the velocity-time graph.
Question 4	Some candidates calculated the angle of the slope correctly. Some candidates who did not arrive at the correct response had subtracted friction rather than adding it.
Question 6	Few candidates calculated the mean force correctly. Many candidates did not take the vector nature of the velocities into account.
Question 7	Some candidates identified which statements concerning impulse were correct.
Question 14	Some candidates identified the correct change required to the experimental set-up to increase the current.

Question 15	Some candidates calculated the energy of each photon correctly. Some candidates calculated the maximum kinetic energy of the electron rather than the energy of the incident photon. This suggests that some candidates might not have read the question carefully.
Question 16	Some candidates calculated the path difference correctly.
Question 17	Few candidates calculated the value of angle X correctly. Many candidates used the value for the angle the ray of light made with the glass/air interface rather than using the angle between the ray and the normal.
Question 20	Some candidates identified the correct circuit that would produce the greatest power dissipated in the lamp.
Question 22	Some candidates determined the resistance correctly.
Question 23	Some candidates identified which statement about red and blue LEDs was correct.

Question paper 2

Question 1(b)	Some candidates determined the tension in one of the cables correctly. Many candidates calculated the weight of the camera and mount, but then did not analyse the forces acting on the camera and mount appropriately.
Question 2(a)	Some candidates stated the law of conservation of linear momentum correctly. A number of candidates did not state it was the total momentum that was conserved, and others did not mention the absence of external forces.
Question 5(b)(ii)	Some candidates explained correctly why star 1 appeared more red than the Sun. A number of candidates wrongly attempted to explain the difference in colour in terms of redshift.

Question 6(a)(i)	Only some candidates explained that mass was being converted to energy, despite being able to calculate the energy released due to this conversion in the next part of the question.
Question 6(b)(ii)	Only some candidates could state the conclusion drawn from studies of beta decay, despite this being mandatory content.
Question 7(c)	Only some candidates gave two appropriate improvements to the experimental procedure. In this question, a number of candidates gave additional responses that were often incorrect. When a candidate does this, general marking principle 21 is applied. A number of candidates gave a response that involved darkening the room, despite the question stating that the experiment was carried out in a darkened room.
Question 7(d)(ii)	Only some candidates stated that the laser is not a point source of light or equivalent
Question 8(a)	Few candidates explained why the photoelectric effect provides evidence supporting the particle model of light.
Question 8(b)(i)	Only some candidates stated correctly what is meant by the term ‘work function’.
Question 9(a)	Few candidates explained why the central maximum is white. Candidates were neither stating that the path difference at all wavelengths is zero, nor that all the colours mix together to produce white light.
Question 9(c)	Few candidates interpreted the graph given in the question correctly. Some candidates claimed that all of the blue and red light was absorbed, and that all of the green light was transmitted. Other candidates claimed

	that the sample appeared green because green light was being reflected rather than transmitted.
Question 9(d)	Few candidates explained why the student's suggestion was incorrect. Few candidates explained that the colours in the spectrum would be closer together, making it more difficult to locate a particular colour. Some candidates stated that having fewer lines-per-millimetre on the grating meant that the lines on the grating were closer together.
Question 10(a)	Few candidates explained the production of absorption lines in the Sun's spectra correctly. A number of candidates answered in terms of emission spectra.
Question 10(b)(iii)(B)	Many candidates did not identify the correct transition. Some candidates either did not give a direction or gave the wrong direction for the transition.
Question 10(c)(ii)	Some candidates drew a line on the diagram in the correct place. A significant number of candidates did not attempt an answer to this question.
Question 11(c)	Few candidates stated and justified what happened to the amplitude of the trace when the switch was closed.
Question 12(a)	Some candidates drew the correct sketch graph. A number of candidates did not draw the correct shape for the curve, and others did not add the correct values to the axes of the graph.
Question 12(b)(i)	Many candidates stated the correct change for the resistance, but few justified the change correctly.
Question 14(a)(ii)	Some candidates calculated the gradient of their line correctly. A number of candidates did not take account of

	the × 10^{-3} on the extension axis despite having written the value on their axis.
Question 14(a)(iii)	Few candidates used their gradient to determine a value for Young's modulus.
Question 14(b)	Only some candidates suggested an appropriate reason why the student had reached their conclusion concerning a systematic uncertainty.

Assignment

3c. Data, including any mean and/or derived values, presented in correctly produced table(s)

Although this should be a straightforward mark to achieve, only some candidates were able to present their data correctly. Common issues included mistakes in calculating mean and/or derived values, columns with missing or inappropriate headings (for example, 'mean' rather than 'mean voltage'), and columns with missing units. A few candidates had inconsistencies in the precision to which they quoted their measurements; for example, some values were quoted with no decimal places and others with one or two decimal places. All values should be quoted to the same precision (as displayed on the measuring instrument), for example, 2.00 and 3.45, not 2 and 3.45.

3e. A citation and reference for a source of internet/literature data

Some candidates were able to cite and reference their secondary source of data (where they were conducting one experiment), or cite and reference a source for their underlying physics (where they were conducting two related experiments). At this level, candidates do not need to use a formal citation and referencing system, but it was encouraging to see that a notable proportion of those that gained the mark used a Vancouver-style system. Common errors included using a full URL as the citation, which is never appropriate; missing the date of access when referencing websites; and missing page numbers when referencing a book.

4c. Accurately plotted data points and, where appropriate, a line of best fit

Only some candidates were able to plot points with sufficient accuracy or draw the appropriate line of best fit. Common issues included lines of best fit that were forced through the origin, lines of best fit where the candidate had drawn a line from the first point to the last point (this is seldom likely to be the line of best fit), and choosing awkward scales that made it very difficult for them to plot points accurately. A few candidates chose to use graphing software, which is acceptable, but made the graphs too small to check the accuracy of plotting. A few omitted to include minor gridlines or used the large default Excel points, which also meant the accuracy of plotting could not be checked. A few candidates drew straight lines of best fit when the data points showed a clear curve.

6. Analysis of experimental data

Some candidates were able to analyse their experimental data appropriately. Those that carried out meaningful calculations were much more likely to gain the mark than those that tried to analyse their data descriptively. Often, candidates' descriptions were not at the correct level for Higher Physics. However, some candidates chose to do calculations that had no real meaning or, having calculated a value, did not communicate its significance. A few candidates carried out invalid averaging. For example, they calculated a value for 'g' for each data point and then averaged the values they had calculated. Candidates should be aware that the correct way to analyse such data is to determine the gradient of the line on their graph (assuming it is a straight line) and use the gradient to determine the quantity being investigated. At Higher level, mathematical analysis is better than wordy descriptions. Candidates must show their calculations or a sample calculation.

7. A valid conclusion that relates to the aim and is supported by all the data in the report

Some candidates were able to state a valid conclusion supported by all the data in their report. A common issue was candidates basing their conclusion on only one set of data in the report. This was typically their experimental data, and they ignored their secondary data, although there were a few instances where the candidate based their conclusion on the secondary data and ignored their experimental data. This tended to be less frequent when the candidate had taken the two-experiment option. Other issues included candidates claiming direct proportionality when their best-fit line did not pass through the origin, although for candidates who had analysed their results by calculating appropriate uncertainties, such a conclusion may have been appropriate within the range of their uncertainties. A better approach is to advise candidates to use the terminology ‘linear relationship’, as that can be applied to any best-fit straight line, whether it passes through the origin or not. A few candidates claimed incorrectly that curves confirmed direct proportionality or that they confirmed the relationship or law being investigated.

8. Evaluation of the investigation

Few candidates were able to give more than one evaluative statement with appropriate justification. Evaluation is a higher-order skill, and is therefore expected to be demanding. Common issues included no or incorrect justifications for their suggestions. In some cases, the suggestions being made would have made no difference to their measurements or results. For example, some suggested that they should have repeated the measurements more times when there was little or no variation in the measurements they had made.

Some candidates are still mixing up the terms, ‘accuracy’, ‘precision’ and ‘reliability’. There is no requirement for candidates to use these terms in their report, but if they do, they must use them correctly. Candidates also made evaluative comments that were either irrelevant to their experiment or to their data. For example, candidates who carried out an investigation into the internal resistance of a cell, using a method measuring the terminal potential difference of the cell and the current, were claiming that the resistance of the wires should have been taken into account. This is not valid for this experimental method, but it may be valid for a method of altering the measured resistance and measuring the current depending upon resistances in the circuit. A notable number of candidates gave evaluative statements learned from Understanding Standards materials that were not appropriate to the investigation they had carried out.

Section 3: preparing candidates for future assessment

Centres are reminded that Higher Physics is a practical course that requires the development of knowledge, understanding, and skills related to practical work.

Candidates **must** be given the opportunity to take an active part in a wide range of practical work throughout the course, including opportunities to evaluate and analyse, to develop the necessary knowledge and skills. While demonstration of experiments, videos and computer simulations may be useful additional tools, they cannot replace active experimental work and do not develop the knowledge and skills associated with practical work.

Opportunities to regularly practise experimental skills during classwork should enable candidates to answer questions assessing aspects of experimental technique and analysis of experimental data. It should also enable candidates to improve their performance in the assignment.

Centres are reminded that in the assignment, teachers and lecturers must ensure a range of topics is available for candidates to choose from, and that they must minimise the number of candidates in a class investigating the same topic. For example, in a class of 20 and given that candidates can work in groups of up to four, there should be a minimum of five different topics available, with each group investigating one of the topics. While it was evident that some centres offered up to seven or eight different topics and ensured each group in a class was investigating a different topic, others offered only two or three and had not minimised how many in a class were investigating the same thing. For clarity, a topic is something such as internal resistance or refractive index. Having groups in the same class investigate the refractive index of different materials would still mean that the groups were investigating the same topic.

Centres should make candidates aware that evaluative statements must be relevant and appropriate to both their practical work and their data. Teachers and lecturers should advise candidates not to copy or memorise Understanding Standards materials, as these may not match the experimental set-up or procedure the candidates used.

Question paper

Many markers commented on the difficulty of reading candidates' handwriting. Candidates should be encouraged to make their handwriting as clear as possible.

Candidates should be encouraged to learn the definitions required for Higher Physics.

Candidates should be encouraged to read the questions carefully and answer the question that is being asked. There is some evidence that candidates are giving answers to questions that are in past papers, and not the question that is being asked. For example, candidates attempted to answer question 10(a) in terms of the brightness of lines in an emission spectrum rather than the formation of dark lines in an absorption spectrum.

Candidates should be made aware that when asked to sketch a graph or complete a diagram, this requires both accuracy and precision in their response. They should be aware that when drawing straight lines, a ruler should be used. Candidates should also use a ruler when drawing a best fit line on a graph.

Candidates should be strongly discouraged from copying down answers from their calculator that contain a large number of significant figures, or from using ellipses, as a penultimate stage in their response before stating their final answer, as this can often introduce transcription or rounding errors into their calculations. They should be strongly encouraged to show only the selected relationship, the substitution, and then the answer, including units, to the appropriate number of significant figures.

Candidates should be discouraged from rounding at the intermediate stage of a calculation, as this can result in their response not being one of the acceptable values.

Centres should ensure that candidates are aware that they should follow sign conventions through to the end of calculations and that they must not drop negative signs in the middle of a calculation. Centres should ensure that candidates understand the vector nature of velocities.

In the examination, candidates should also be encouraged to refer to the data sheet and the relationships sheet, rather than trying to remember data and relationships. It has been noted that, although the relationships sheet shows the correct use of subscripts or superscripts, some candidates are changing subscripts to superscripts (powers) in relationships, resulting in the relationship being incorrect. For example:

$$\frac{V^1}{V^2} = \frac{R^1}{R^2}$$

Markers cannot give credit for this.

Candidates should:

- be aware of how the photoelectric effect provides evidence for the particle model of light
- know that the path difference at a central white maximum is zero for all wavelengths of light
- be given an opportunity to practise interpreting graphs that may be unfamiliar to them
- know the difference between emission and absorption spectra and how they are produced
- be given regular opportunities to analyse uncertainties associated with experimental data
- know the charging and discharging graphs for capacitors
- be able to explain why the resistance of a variable resistor in a capacitor charging circuit is reduced to maintain a constant current
- be given the opportunity to practise drawing graphs where the data does not give a perfect fit, so they become skilled at drawing a line of best fit appropriate to the data
- be discouraged from drawing a line from their first data point to their last data point, unless it agrees with the rest of the data
- be discouraged from forcing their line of best fit through the origin

- be encouraged to take care of powers of ten when calculating the gradient of a line of best fit

Centres should ensure that candidates know that they should provide the number of responses required by a question. Candidates should be aware that if they supply excess answers, markers will apply general marking principle 21.

When carrying out practical work, candidates should be given opportunities to discuss practical improvements to their experiments.

Centres should refer to the Physics: general marking principles document on the Higher Physics subject page for generic issues related to the marking of question papers and assessments. Centres must adopt these general instructions for the marking of prelim examinations and centre-devised assessments for any SQA Physics courses.

Assignment

Centres must ensure that the range of topics being offered is sufficient and that the topics are at an appropriate level for Higher Physics. Whole classes or cohorts, or a significant proportion of a class, investigating the same topic does not meet the assessment conditions and is therefore not appropriate. Offering Higher candidates topics at National 4 or National 5 level, or even Advanced Higher level, can disadvantage them in the marks they are awarded. The experiments can be standard ones from the Higher course and do not have to be unfamiliar or from outwith the course.

Centres must give candidates the 'Instructions for candidates' section from the Coursework assessment task for Higher Physics, which is available on the Higher Physics subject page. Centres must not alter or add to the content of these instructions.

Centres should ensure that if candidates are only conducting one experiment, they have an opportunity to find data from internet and/or literature sources that is relevant to their experiment. If candidates are seeking to find a numerical value (for example, the refractive index of Perspex) from their data, their second source should also include data that allows them to find the numerical value, rather than being a data book value for the quantity.

Centres must give candidates opportunities to take part in a wide range of practical work before choosing a topic for investigation.

Centres should ensure that candidates can cite and reference their sources correctly. While a formal citation and referencing system isn't required, candidates should be strongly encouraged to follow a system such as the Vancouver referencing system.

Centres should ensure that candidates have frequent opportunities to produce graphs from experimental data and analyse the data from the graphs. Where graphing software is used, centres should ensure that candidates know how to use it correctly.

Candidates should be made aware that they need to conclude all of their data, both practical and literature. Where a candidate's experimental data does not agree with their literature data, their conclusion should reflect this.

Centres should advise candidates to use the term 'linear relationship' when their graph results in a best-fit straight line. This avoids problems around whether lines show direct proportionality or not.

Centres should ensure candidates understand that a best-fit curve on a graph cannot be used to confirm a relationship or law. More appropriate quantities that result in a straight line of best fit would have to be plotted.

Centres should ensure that candidates are given opportunities to develop the necessary skills to evaluate their data and experimental procedures.

In preparation for the report stage of the assignment, teachers and lecturers must check the materials that candidates have gathered to ensure that they do not have prohibited items. For example, while candidates can take in a table of their raw data, this must not have blank columns ready for the candidate to fill in, partially completed columns with headings and units, or mean and derived values already calculated, such as the sine of the angles in a Snell's Law experiment. Extracts from internet or literature sources must not have sample calculations included. Teachers and lecturers must refer to the course assessment task document to ensure that the conditions of assessment are understood and applied.

Centres are also advised to consult the generic document Guidance on conditions of assessment, which is available on the Higher Physics subject page for clarification and exemplification of acceptable conduct during coursework assessments.

Appendix: general commentary on grade boundaries

Our main aim when setting grade boundaries is to be fair to candidates across all subjects and levels and to maintain comparable standards across the years, even as arrangements evolve and change.

For most National Courses, we aim to set examinations and other external assessments and create marking instructions that allow:

- a competent candidate to score a minimum of 50% of the available marks (the notional grade C boundary)
- a well-prepared, very competent candidate to score at least 70% of the available marks (the notional grade A boundary)

It is very challenging to get the standard on target every year, in every subject, at every level. Therefore, we hold a grade boundary meeting for each course to bring together all the information available (statistical and qualitative) and to make final decisions on grade boundaries based on this information. Members of our Executive Management Team normally chair these meetings.

Principal assessors utilise their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. We can adjust the grade boundaries as a result of the discussion at these meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper or other assessment has been more, or less, difficult than usual.

- The grade boundaries can be adjusted downwards if there is evidence that the question paper or other assessment has been more difficult than usual.
- The grade boundaries can be adjusted upwards if there is evidence that the question paper or other assessment has been less difficult than usual.
- Where levels of difficulty are comparable to previous years, similar grade boundaries are maintained.

Every year, we evaluate the performance of our assessments in a fair way, while ensuring standards are maintained so that our qualifications remain credible. To do this, we measure evidence of candidates' knowledge and skills against the national standard.

For full details of the approach, please refer to the Awarding and Grading for National Courses Policy.