Course Report 2017

Subject	Physics
Level	National 5

The statistics used in this report have been compiled before the completion of any Post Results Services.

This report provides information on the performance of candidates which it is hoped will be useful to teachers, lecturers and assessors in their preparation of candidates for future assessment. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published assessment documents and marking instructions.

Section 1: Comments on the assessment

Summary of the course assessment

Component 1 — question paper

The National 5 question paper consists of Section 1, which is an objective test worth 20 marks; and Section 2, which contains restricted and extended response questions worth 90 marks. Section 2 is scaled to 60 marks.

The majority of marks available are awarded for applying knowledge and understanding. The remaining marks are awarded for applying scientific enquiry, scientific analytical thinking and problem solving skills. A variety of question types are used in the question paper, including:

- extended questions based upon an application of course content
- extended questions based upon practical/experimental work
- extended questions based on content not specified within the course, assessing skills
- extended questions based on content within the course, assessing skills
- open-ended questions
- extended questions assessing scientific literacy
- extended questions based upon course content
- multiple-choice questions

This component presented candidates with the opportunity to demonstrate knowledge and understanding, as well as a range of skills.

Analysis of the question paper results showed that all questions were answered correctly by at least a proportion of the candidates, and that there was a spread of performances across the range of available marks.

The general impression of markers was that the question paper was a little more challenging than previous years, but that the paper included appropriate questions to provide good discrimination for candidates performing at ‘A’ and ‘B’ levels. The statistical analysis indicated a decrease in the average mark compared to previous years, but a larger standard deviation in the mark totals.

The grade boundaries for this assessment were reduced below the notional values at the grade A boundary and at the grade C boundary. There was no change to the upper A grade boundary.

Several markers indicated that responses they observed may suggest that some candidates had not prepared effectively for the assessment or had been presented at the wrong level. Statistical analysis showed that a significant number of candidates achieved marks well below the grade C boundary.

Component 2 — assignment

In the National 5 assignment, candidates have to investigate a relevant topic in physics and communicate the findings of their research in a report. This topic must have a relevant application and an effect on the environment and/or society.

The assignment assesses the application of skills of scientific enquiry and related knowledge and understanding of physics.

Markers commented that candidates had the opportunity to achieve marks for all of the skills and knowledge and understanding being tested. In addition, many markers commented that there was opportunity for many candidates to achieve high marks and few candidates achieved significantly low marks. These observations were confirmed by the statistical analysis of the marks achieved for this component.

Markers commented that the majority of candidates appear to be following the advice available to them in 'Appendix 1: Instructions for Candidates', which details advice and guidance for the various stages of the assignment, and the marks available for each aspect of the report. However there were still occasional instances of candidates who appeared to have a poor understanding of the requirements of the task.

It was noted that candidates who had chosen an appropriate experiment/practical activity as one of their sources of data tended to perform well in the assignment.

Section 2: Comments on candidate performance

Areas in which candidates performed well

Component 1 — question paper

Section 1 (Objective test)

Questions 3, 5, 11, 12, and 20 were answered particularly well (with a high percentage of candidates selecting the correct response).

Section 2 (Extended answers)

Many candidates were successful with questions requiring the selection of a relationship followed by a calculation and final answer.

Candidates who successfully answered questions that required justifications, descriptions or explanations were able to structure their answers to present information which was clear and relevant to the question being asked. They used correct terminology and references to appropriate physics concepts (eg in Question 2(b)(ii) the effect of combining resistances in parallel and the relationships between resistance, current, voltage and power in electrical circuits).

Q2(b)(i): Most candidates were able to calculate the combined resistance of two resistors connected in parallel.

Q4(a): The majority of candidates were able to calculate the frequency of waves given the time taken for a single wave to pass a point.

Q4(b): The vast majority of candidates were able to calculate the velocity of a wave given information about its wavelength and frequency or (by an alternative method) the distance travelled and the time taken.

Q5: Given that this was an open-ended question, it was noted that candidates performed considerably better in this question than in other open-ended questions in the past. Good answers related factual statements about the different types of radiation to their similarities and differences (eg their nature, range, penetrative power, absorption, effects on matter, radiation weighting factors and uses).

Q8(a): Most candidates identified that an object experiences zero displacement when completing a lap of a circuit.

Q8(c): The majority of candidates calculated the average speed of a vehicle giving information about the distance travelled and time taken.

Q9(a): Most candidates were able to calculate the mass of an object given its weight, using a correct value for gravitational field strength.

Q11(c): The majority of candidates were able to calculate the average force acting on an object giving information about the energy transferred and distance over which the force acts.

Q12(c): Most candidates were able to state that the time taken for visible light to travel a certain distance is equal to the time taken for radio waves to travel the same distance.

Component 2 — assignment

Section 1: Statement of Aim

The majority of candidates were able to devise an appropriate aim for their investigation.

Section 2: Describe an application of physics and explain its effect on the environment/society

Most candidates were able to access the second mark for explaining a clear relationship between the application and its effect on the environment/society.

Section 3: Select relevant sources

Many candidates started by stating that a source was relevant or reliable followed by a reasoned explanation, clearly indicating why it was relevant or reliable.

Section 4: Select relevant data/information from sources

Most candidates selected data that was relevant to the aim of the report. These candidates included the relevant raw data in their report and made clear statements about the sources of this data.

Section 5: Process and present data/information

(a) Processing of data/information: Some candidates provided two acceptable examples of accurately processed raw data from at least two sources.

(b) Presentation of data/information: Most candidates chose appropriate formats to present the selected data/information from at least two of their sources.

(c) Complete labelling of graphs, tables, charts or diagrams: Many candidates successfully achieved this mark because of the consistent, correct labelling of their presentation formats.

(d) Comparison of data/information from at least two sources: Some candidates successfully accessed this mark by comparing data from two sources in their report, or by making a clear and justified statement that the two sources of data could not be compared.

Section 6: Drawing a valid conclusion

Successful candidates related their conclusion to their stated aim and also provided sufficient relevant data to support their conclusion within the report.

Section 7: Apply knowledge and understanding of physics

Some candidates were able to access full marks for a clear explanation, which demonstrated a good understanding of the physics involved. Many candidates were able to access the majority of marks by offering an explanation which demonstrated a reasonable understanding of the physics involved and included appropriate physics terminology and concepts.

Section 8: Structure of the report

The vast majority of candidates were able to achieve most of the marks available for this section. Most candidates provided an appropriate and informative title related to their report and, in general, candidates provided sufficiently detailed references to the sources, which would allow them to be retrieved by a third party. The vast majority of reports were sufficiently clear and concise.

Areas which candidates found demanding

Component 1 — question paper

Section 1 (Objective test)

Questions 10, 14, 15, 16 and 19 were answered incorrectly by many candidates.

Q10: A significant number of candidates failed to identify that the calculation of the time taken for a signal to be transmitted to, and reflected back from, an object needs to take account of the fact that the total distance travelled by the signal is double the distance between the transmitter and the object itself.

Q14: Many candidates were unable to determine the directional bearing of the resultant of two forces acting at right-angles to one another.

Q15: Some candidates did not identify that a velocity-time graph that included both positive and negative values for velocity would indicate a change in direction of the object.

Q16: Many candidates did not identify that, no matter what point a trolley is released from, its acceleration down a slope of constant gradient is the same.

Q19: Few candidates were able to calculate the maximum mass of water converted into steam giving information about the time for which the water was heated, the energy transferred per unit time, and using the correct value for the specific latent heat of vaporisation of water.

Section 2 (Extended answers)

In general, questions requiring justifications, descriptions, or explanations were more demanding for candidates. There was often a lack of precision in candidates' responses, especially when using physics terminology and principles.

Q1(a)(i): Few candidates were able to state the purpose of a fuse as being 'to stop too large a current' or 'prevent wiring from overheating' (or similar).

Q1(b): Few candidates were able to explain, in terms of electron flow, what is meant by alternating current. Many neglected to mention the required term *electron flow* in their answer, as indicated in the stem of the question, and others did not provide a clear description of the electrons repeatedly changing directions.

Q2(b)(ii): Of those that identified the correct effect, few candidates provided a complete explanation of the effect of altering an electrical circuit on the power dissipated by a particular component in the circuit. Although many identified the effect of altering the circuit on the total resistance of the circuit, few extended this to explain its effect on the current in (or voltage across) the component in question.

Q3(b): Although many candidates correctly identified that when the volume of a gas is decreased at constant temperature the frequency of the collisions of the gas particles with the container walls increases, some negated this statement with an incorrect statement about the particles travelling faster, or hitting the walls harder. In addition many candidates neglected to discuss the overall effect of the increased frequency of collisions on the force exerted on the walls.

Q3(c): Few candidates were able to sketch the correct shape for a graph of pressure against volume for a gas at constant temperature.

Q4(a)(ii): Many candidates did not make a suitable suggestion about how the accuracy of the frequency determined for a wave could be improved. Some candidates simply stated that measurements should be repeated, without indicating that the average of these measurements should be determined.

Q4(c): Although many candidates correctly represented diffraction taking place as waves passed between two obstacles, few were able to complete the diagram accurately indicating that the section of waves passing through the middle of the gap would continue to travel in the same direction, without any change in wavelength (ie there would be some straight sections).

Q4(d): Few candidates explained that a decrease in amplitude of the waves related to a decrease in energy.

Q6(a): Although this was an unfamiliar context for many candidates, few were able to identify that a measurement of background count rate is required to determine corrected count rate in experiments relating to radiation. This should be familiar from candidates covering half-life.

Q6(b)(ii): Many candidates attempted to use the graph provided in the stem of the question to determine the thickness required to reduce the corrected rate to the specified value, only to find that this point lay outwith the range provided, and subsequently were unable to access any of the marks available.

Q7(a): Few candidates were able to state what is meant by the activity of a radioactive source when related to a specific value. Many candidates simply stated that activity was the number of decays per second without reference to the value of 80 kBq stated in the stem of the question.

Q7(b)(i): Some candidates did not make it clear that it was the neutrons released in one reaction that went on to cause further reactions. A few candidates indicated that they appeared to think that it was a single nucleus that kept splitting rather than a succession of different nuclei.

Q7(b)(ii): Some candidates obtained a correct final answer by an incorrect principle of physics; namely that the energy released in a single nuclear reaction could be 'spread out' over a prolonged period of time. These candidates were unable to access any marks other than that allocated for the relationship between power, energy and time.

Q7(c): Only a minority of candidates were able to state a suitable use of nuclear radiation. Responses relating to generation of electrical energy were not acceptable as this had already been stated in the stem of the question.

Q8(b)(i): Although the majority of candidates identified that the distance travelled could be determined from the area under a speed-time graph, many made errors in extracting values from the graph.

Q9(a): Many candidates failed to identify that this situation involved balanced forces. Many simply stated that the forces acting on the barbell were equal without qualifying this by reference to their relative directions.

Q9(c): Many candidates failed to initially determine the unbalanced force acting on the barbell and were therefore only able to access the mark available for the relationship between unbalanced force, mass and acceleration. It was noted that some candidates obtained a correct final answer by an incorrect principle of physics; namely calculating a separate acceleration for each of the individual forces and subtracting these values from each other. These candidates were only able to access the mark available for the relationship between unbalanced force, mass and acceleration.

Q10: Many candidates identified possible situations where the wheels of a lorry may be raised or lowered, but few went on to develop their answer to explain how raising or lowering the wheels would affect the situation using appropriate physics terminology and principles (eg by relating the area of contact between

the tyres and the road to force and pressure, or by discussing the effects of friction).

Q11(a): Few candidates were able to identify the correct graph for the vertical velocity of a projectile against time.

Q11(b): Although most candidates identified that the time taken for a ball to reach the ground is independent of its horizontal velocity, few were able to justify this in terms of it having the same vertical acceleration.

Q12(a)(ii): Although most candidates attempted to calculate a distance in metres from a distance specified in light-years using the relationship between distance, speed and time, there were many errors in the processing of this information (eg an incorrect number of days in a year being used and excessive rounding of intermediate values leading to an incorrect final answer).

Q12(b)(ii): Few candidates were able to state a suitable detector of visible light for use in a telescope. Many simply stated a device that would contain a detector (eg a camera).

Component 2 — assignment

Section 1: Statement of Aim

Although the vast majority of candidates gained the mark for providing a suitable aim for their assignment, a number of them overcomplicated their aim by adding multiple aspects to it, such as ‘The effectiveness of seatbelts and the physics behind them’ or ‘The power output of solar cells in different conditions and their impact on society’. Often, in these cases, not all of the aims were investigated or referred to in the conclusion. This led to a difficulty in accessing the conclusion mark later in the report.

The choice of some topic areas (eg semiconductor devices) made accessing marks in the underlying physics section, in terms of applying knowledge and understanding at a suitable level, more difficult for some candidates later in the report. Also, a few candidates identified aims that had little to do with physics at National 5 level (eg ‘The effect of gender on skin cancer rates.’ or ‘The number of people employed in nuclear industries in different countries.’).

Section 2: Describe an application of physics and state its effect on the environment/society

Many candidates did not gain the first available mark because they did not provide an appropriate application and use a physics explanation to describe its characteristics and/or features. (For example, to state that 'a seatbelt provides a restraining force during a car crash'; 'solar cells convert light into electrical energy'; ‘crumple zones reduce the force acting on passenger during a car crash by increasing the time of impact’; ‘nuclear power stations convert nuclear energy into electrical energy’; ‘LEDs convert electrical energy into light’; or ‘X-rays are high energy electromagnetic waves that absorbed by different amounts depending on the density of the material through which they are passing.’)

Section 3: Select relevant sources

Some candidates did not provide a sufficient explanation for the choice of sources. For example, some stated ‘my source was relevant to my aim’ or ‘my source was reliable’ with no/insufficient explanation or evidence of why it was relevant or reliable.

For sources of data that came from practical activities, explanations such as ‘it is reliable, because I did it myself’ were insufficient, unless they went on to explain how they repeated their measurements (and there was some evidence that they did so), or took control of other variables that may have affected their results.

Section 4: Select relevant data/information for inclusion in the report

Some candidates selected data that was not relevant to the aim of the report (for example, data on numbers of car accidents without any reference to seatbelt use).

The relevant raw data must be included in the report and be clearly identifiable to allow subsequent access to marks in section 5. A few candidates did not make it clear what was relevant data or the sources of this data.

Some candidates selected sources of data that were hard to process (eg graphs without sufficiently detailed scales on axes or 3D bar charts, where it was hard to ascertain values for the heights of the bars). In addition, there were several examples where indistinct text in the copy of the source of data included in the report by the candidate made it hard for markers to ascertain the accuracy of their processing later in the report.

Section 5: Process and present data/information

(a) Processing of data/information: Many candidates did not present the information accurately enough to attract the relevant marks.

Some graphs were poorly drawn, with inaccurate scales and inaccurate points (particularly where they were not drawn on graph paper). Some candidates were also unable to draw appropriate lines or curves for their graphs.

When using software packages to produce graphs or charts, some candidates failed to alter some of the parameters from their default values and, as a result, made it very difficult for them to be checked for accuracy (eg the lack of minor gridlines, and excessively large data point markers).

When attempting to process data provided in graphs or charts into tabular form, some candidates stated unreasonably accurate values in their data given the raw data provided.

When candidates had produced pie charts, it was often the case that the data had not been processed correctly. This meant that the proportions of the sections of the pie chart were incorrect. The use of 3D pie charts as a presentation format by a few candidates made it very hard for markers to ascertain their accuracy.

When candidates processed data by calculation there were a number of instances of the incorrect use of significant figures and/or inaccurate rounding.

Where candidates attempted to process information in the form of a summary there was often insufficient detail to convey an accurate picture of the information and instead candidates just stated a simple generalisation or conclusion. On the other hand, there were a few instances where the summary was, in fact, more expansive than the original data and therefore was not really a summary at all.

(b) Presentation of data/information: Some candidates produced an inappropriate presentation format (eg a pie chart where the values used for each section were not parts of a total amount).

Some candidates who processed their data by calculation, failed to present a sample calculation organised in a logical and coherent manner.

(c) Complete labelling of graphs, tables, charts or diagrams: Some candidates did not achieve this mark because they did not label the relevant presentations completely.

(d) Comparison of data/information from at least two sources: Some candidates did not make any statement regarding a comparison of their data/information from two sources. This was often due to the fact that they had chosen two (or more) disparate sources that did not allow comparison, although a statement from the candidate to this effect, accompanied by a suitable justification, would have been awarded the mark.

Some candidates did not make it clear what it was about their data/information from the different sources that was comparable, but simply stated an overall conclusion from the combined data/information that was not justified for either piece of data/information taken individually.

There were also some candidates who made inaccurate statements about the comparison of their data (eg stating 'both my sources show that...' when, in fact, the data provided was not comparable.)

Section 6: Drawing a valid conclusion

Some candidates did not relate their conclusion to their stated aim. This was particularly the case when candidates had stated multiple aims earlier in their report but had not offered conclusions to all of these aims in this section.

In addition, there were cases where the data that candidates had provided elsewhere in the report did not support the conclusion.

Section 7: Apply knowledge and understanding of physics

Many candidates achieved one mark for demonstrating a limited understanding of the physics involved. Some candidates did not achieve marks for this section because they offered little or no relevant physics explanations and/or did not relate these to the application being discussed.

When candidates had selected topics for which the underlying physics was at a level above National 5, it was often hard for them to demonstrate either reasonable or good understanding of the physics involved (see previous comments for Section 1).

Section 8: Structure of the report

A few candidates did not give an appropriate and informative title that related to the report content. The title ‘National 5 Assignment’ is not an appropriate or informative title.

Some candidates did not give sufficiently detailed references to the sources that would allow them to be retrieved by a third party. Insufficiently detailed website addresses, such as ‘www.bbc.co.uk/education’, were occasionally provided. When candidates had provided text references, these were often incomplete (eg lacking an edition number or a page number). When candidates had elected to process experimental data in their report, they often omitted to provide either a title or aim for the experiment as a reference.

Section 3: Advice for the preparation of future candidates

Component 1 — question paper

Centres should be aware the National 5 Physics course has been revised for session 2017–18 and, while there are no significant changes to course content, centres should be aware of the removal of the requirement to complete unit assessments to obtain a course award, the suggested alteration to possible teaching order, and the extension to the duration of the exam. These changes are detailed in the National 5 Physics Course Specification document on the SQA website.

Each year, the question paper samples the full range of course content. This means that candidates should be familiar with all aspects of the course.

Candidates sometimes did not give any answer to particular questions, which could suggest lack of familiarity with the content of the course to which the questions referred. The question paper tests the application of knowledge and understanding, and the application of the skills of scientific enquiry, scientific analytical thinking and problem-solving skills. Candidates should have the opportunity to practise these skills regularly to familiarise themselves with the type and standard of questions that may be asked.

Section 1 is worth 20% of the marks available for the course assessment. At this level, candidates may spend too much time completing Section 1 of the question paper, which then reduces the time left for completing Section 2, which is worth 60% of the marks. Candidates should practise objective test items for Section 1 and extended questions for Section 2 to ensure that they can complete them in a time proportionate to their mark allocation in the question paper.

Questions that require justifications, descriptions or explanations always feature in the assessment but are often answered poorly. These types of question are frequently based on practical coursework and data obtained from experiments. Candidates should have the opportunity to experience exposure to key practical work, which may help to improve understanding of concepts, procedures and apparatus. Frequent exposure to the use of physics terms and ‘language’ may help candidates develop their communication skills when answering such questions.

Candidates should be made familiar with the various 'command words' used in physics questions and how to respond to them. For example, when candidates are asked to 'show' that a particular answer is correct, they should start their response with an appropriate formula, show the correct substitutions, and end with a final answer, including the correct unit, to obtain all the marks available. In a 'must justify' question, they must not only state or select the correct response, but also provide supporting justification to attract any marks.

For questions requiring calculations, the final answer sometimes had the wrong or missing unit. Centres should remind candidates that a final answer usually requires both a value and a unit. Candidates should also be familiar with the full range of units used for quantities covered in the National 5 course.

In calculations, some candidates were unable to provide a final answer with the appropriate number of significant figures (or to round these correctly). It was evident that some candidates confuse significant figures with decimal places. Centres should ensure that candidates understand and can apply the rules concerning significant figures.

Candidates should be given the opportunity to practise open-ended questions at appropriate points during the course. They should be encouraged to not only state relevant physics concepts but also to relate them to the situation described in the question. Having attempted such questions, it may be beneficial for them to have sight of a range of responses and to discuss how marks would be awarded for these responses. Such responses can either be generated by their peers or are available from sources such as the SQA Understanding Standards website.

The published marking instructions contain general marking principles, and also detailed marking instructions for specific questions. Candidates should be encouraged to become familiar with the allocation of marks and the importance of complete final answers when answering numerical questions. Candidates should have access to specific marking instructions when practising exam-type questions. The marking instructions published on SQA's website illustrate how marks are apportioned to responses.

Centres should also refer to the Physics: General Marking Principles document on the SQA website for generic issues related to the marking of question papers in SQA qualifications in Physics at National 5, Higher and Advanced Higher levels. Centres are advised to adopt these general instructions for the marking of prelim examinations and centre-devised assessments for any SQA Physics course.

Component 2 — assignment

The revision to the course for session 2017–18 involves significant change to the coursework assessment (ie the assignment). Centres are advised to consult the National 5 Physics Course Specification document on the SQA website in conjunction with the Course Assessment Task for National 5 Physics. The latter document contains full details of the nature of the assignment task together with advice to teachers and lecturers, detailed marking instructions and instructions to candidates.

Centres are also advised to consult the generic document Guidance on Conditions of Assessment for clarification and exemplification on acceptable conduct during coursework assessments.

Whilst it was pleasing to see that the conditions of assessment for coursework were adhered to in the majority of centres, there were a small number of examples where this may not have been the case. Following feedback from teachers, we have strengthened the conditions of assessment criteria for National 5 subjects and will do so for Higher and Advanced Higher. The criteria are published clearly on our website and in course materials and must be adhered to. SQA takes very seriously its obligation to ensure fairness and equity for all candidates in all qualifications through consistent application of assessment conditions and investigates all cases alerted to us where conditions may not have been met.

Further support and exemplification for the assignment task will be made available on the SQA Understanding Standards website and via events.

There are a few issues relating to the current assignment task that are worth noting in relation to the revised task for next session:

Statement of Aim

Statements of multiple aims should be avoided.

Processing information

Successful candidates were able to process the information accurately in the chosen presentation format by:

- correctly selecting which type of graph to draw – generally, for experimental data in physics a scatter graph with a straight line or curve of best-fit would be most appropriate
- using graph paper to draw graphs and ensuring that appropriate scales were used and that data points were plotted accurately
- ensuring that, when using Excel or other software packages to draw graphs, the appropriate type of graph was selected, as well as making sure that the accuracy of the data points could be ascertained by markers (eg by using small data point markers and including minor gridlines).
- ensuring that at least one sample calculation was shown, together with the correct units when processing data by calculations and that an appropriate number of significant figures were used and rounding these figures correctly

Labelling of graphs, tables, charts or diagrams

Centres should advise candidates to check thoroughly that they have included all appropriate units, headings and labels for all of their presented and processed data. These should be consistent with the raw data provided and care should be taken that, by omission or addition, the sense of the labelling is not altered.

Drawing a valid conclusion

Successful candidates accessed this mark by providing a conclusion that related to the aim and supported this conclusion with relevant evidence within the report.

Given that some candidates did not state a valid conclusion because it only related to one part of their stated aim, centres should advise candidates not to be ‘over ambitious’ with the aim of their assignment and to avoid multiple aims.

Apply knowledge and understanding of physics

Successful candidates were able to access these marks by showing a good comprehension of the research and application, and providing an explanation that included a discussion of some of the physics involved at a depth appropriate to National 5.

Again, careful advice on the choice of topic is essential here. Many candidates may wish to choose an area that really interests them. However, it was clear that some chose topics for which the underlying physics was well above National 5 level. Consequently, they struggled to explain the physics or ended up copying verbatim from references.

Structure of the report

Centres should ensure that candidates know what is meant by ‘sufficient detail to allow them to be retrieved by a third party’ — ie it must be the full URL for a website; and for a text book it should have title, author, page number, and either edition number or ISBN.

Grade Boundary and Statistical information:

Statistical information: update on courses

Number of resulted entries in 2016	14888

Number of resulted entries in 2017	14165

Statistical information: Performance of candidates

Distribution of course awards including grade boundaries

Distribution of course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark -				
A	31.7%	31.7%	4486	68
B	21.5%	53.2%	3044	56
C	20.0%	73.1%	2829	45
D	9.4%	82.5%	1331	39
No award	17.5%	-	2475	-

General commentary on grade boundaries

- While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

- Each year, SQA therefore holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

- The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

- The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

- Where standards are comparable to previous years, similar grade boundaries are maintained.

- An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions, and the mix of questions, are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in, say, Higher Chemistry, this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related, as they do not contain identical questions.

- SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as arrangements evolve and change.