General Certificate Secondary of Education
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Statistics   43102

(Specification 4310)

Unit 2: Controlled Assessment

Report on the Examination

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Unit 2: Conrolled Assessment

General

As last year the vast majority of centres experienced little difficulty in meeting the deadlines in getting marks and work to moderators on time, and they are thanked for this. Again the majority of centres managed to send the correct documentation with the work. It is important that those centres using EDI remember to send a copy of the marks to the moderator as well as to the exam board.

It is important that centres appreciate that they each have access to a Controlled Assessment adviser who is there to provide support. Teacher standardising meetings have now been replaced with on-line teacher standardising, which has not been used by as many centres as hoped. The main advantages of this are that teachers no longer need to take time out of school to utilise it, and that it can be done at a time of the centres/teachers choosing. The lack of take up by teachers of the on-line standardising could be one of the reasons why some centres needed their marks adjusting. Again, those who annotate and provide clear evidence of how marks have been awarded do make it easier for a moderator to agree to the marks awarded. Some centres, very helpfully, provided a detailed sheet with a commentary on it indicating clearly how the marks had been arrived at. They are thanked for this.

The 'Cars' and 'Athletics' tasks appeared to have been about as popular as each other with centres, and neither task being more or less well done than the other. There seemed to be between 3% and 6% of centres submitting a mixture of both tasks this year. Some of the students doing the Athletics task decided that this would be the Olympics, presumably due to the publicity about London 2012. This was not a problem here as the Olympics contain Athletics and so similar data could be used. However, centres should be aware of the dangers of allowing students to depart from the theme given. The centre's CA adviser is available for consultation should the centre have any question about the themes given.

For the first time since the controlled assessment started there seems to be a clear difference between the marks gained by students in the two parts of the controlled assessment, with marks being generally slightly higher in the written assessment than in the investigational task itself. This appeared to be due, in part, to the slightly different form of the section B and also to the fact that students performance in the written assessment is improving in general.

As last year, the majority of centres are to be congratulated on the variety of tasks their students produced from the given themes.

The investigational tasks

Very little use of just the small data set was seen in either task.

The websites provided more than sufficient data for the students to sample from, and the majority appeared to have no real problems accessing the data.

Strand 1   Hypothesis and strategy (0 - 2)

The vast majority were able to produce a sensible, testable hypothesis. For cars this often involved either two different manufacturers, manufacturers from two different countries, or petrol and diesel. For the Athletics task the hypothesis often involved athletes from two countries. Generally, slightly better hypotheses were chosen by students following the Cars task.

Refining from here allowed students the opportunity to develop a strategy. It was clear that many students had an interest in what they were attempting to do and plans varied in detail and depth, but those just listing the methods they were going to use were restricted to 1 mark. Sometimes the depth of planning was linked to the selection and collection of data, showing some awareness of how strata were to be identified, and why, with a link to the reasons for their choice of variable(s). Another way students could develop their planning was to consider what it is they are attempting to analyse, indicating what variables were involved and then limiting the effects of selected extraneous variables. For example a student comparing petrol and diesel engines may have decided to limit the nature of the vehicles to ensure that like was being compared with like. This decision does need to be explicit. There was more evidence this year that students are attempting to control variables.

Strand 2   Selection and Collection of Data (0 - 4)

Many students had no problem gaining 2 marks, having collected some appropriate data, identified the source and indicating that sampling had taken place. In order to gain 3 or 4 marks, considerably more work in the way of sampling is required, and it was noted that a number of centres were slightly generous in their interpretation of the assessment criteria here. Attention is drawn to the bullet points on the elaboration document for 3 - 4 marks in this strand, which should help centres in the award of these marks.

The sampling method was not always named and was sometimes incorrectly named. Details of sampling were often weak. Justification also was weak and students would be well advised to consider the population when deciding on an appropriate sampling method to use, as this will help provide the necessary, appropriate reason for their choice. To get a 'fair' sample, or to get 'representation' are not sufficient on their own to justify their choice of sampling method.

Sample sizes often seem to be 30, regardless, which for some tasks will be an enormous quantity of data and for others will provide a very small sample size. Students should be encouraged to decide on the size of their sample by asking themselves questions such as , is it large enough to allow for representation, is it large enough for them to use the techniques that they wish. Students are not required to justify their choice of sample size.

Strand 3   Use of Graphs and Diagrams to test hypotheses (0 - 7)

A good variety of graphs and diagrams were drawn by many students. There are three keywords in the assessment criterion for this strand. They are 'appropriate', 'accurate', and 'use'. The diagrams need to be appropriate for the type of variable/data being represented. They need to be accurate. This will usually require the use of graph paper, an obvious exception being pie charts. Diagrams such as histograms will usually be better for being drawn using a ruler. Diagrams also need to be of a size that can be used. 'Use' means interpretation, and here it should be within the context of the situation. Merely commenting on skewness shown in a box-plot is not an interpretation and on its own could not gain more than 2 marks.

The use of a cumulative frequency diagram to lead to a box-plot is the natural process to use when the data set is quite large, but for a data set with only 15 or so values it is usual to list them in order of size to find the necessary values to enable a box-plot to be drawn.

It is always useful for students to provide some working out or a table of values so that teachers and moderators can check at least some of the diagrams, such as cumulative frequency graphs or histograms, for accuracy.

As last year, many students are seen to be drawing cumulative frequency graphs and box-plots, and no other diagrams. Centres are reminded that provided these are accurate, appropriate and interpreted well, they can be awarded a maximum of 4 marks, as only one diagram is being interpreted. Should there be inaccuracies or poor interpretation then a mark of 3 is more likely to be awarded.

Evidence seen in the samples seen this year does suggest that students are starting to realise that it is not necessary to draw every type of diagram that they can think of, and that essentially only two different types of diagram are actually required, provided they are appropriate, accurate and interpreted.

There are various ways students may move into the 5 - 7 mark box. Having already gained 3-4 marks for appropriate diagrams being accurately drawn and interpreted, the student may have included higher tier diagrams as one of two different types, in which case a mark of 5 may be awarded. Alternatively, a student may have already gained 3 - 4 marks for appropriate diagrams being accurately drawn and interpreted; and should the diagrams be of different types and the interpretation sophisticated, then conclusions about the validity of the hypothesis may be drawn, and again a mark of 5 may be awarded. Without interpretation, diagrams cannot contribute to a mark above 2, regardless of whether they are higher tier or foundation tier diagrams.

Students should be encouraged to label clearly what data their diagrams are showing, without this it is impossible to see whether any interpretation is correct.

As last year, interpretation is a skill that some students find very difficult, with few showing sophistication.

Strand 4   Use of calculations to test hypotheses (0 - 7)

In the Cars task a popular approach was to use percentages, either as percentage loss or percentage remaining and use these to make comparisons, which was a sensible start and immediately allowed weaker students to start earning marks in the 1 - 2 box.

As last year, many students found values for a series of summary measures and then attempted to interpret all of them at once, often leading to a garbled set of statements which include incorrect ones. Students are far better advised to find the values for the mean values and then compare these immediately in context. Many students do not appreciate the difference between observations and interpretations. For example "the mean for German sprinters is greater than the mean for British sprinters" is not an interpretation. A simple interpretation would be along the lines of "the mean time for German sprinters is 11.1 seconds but for British sprinters it is 10.6 seconds, therefore British sprinters are faster". Comments such as "more spread", "bigger IQR", "positive correlation", "negative skew" following a calculation, are not interpretations and cannot, on their own, contribute to a mark above 2.

As last year, there was a strong feeling, from some students, that a list of calculations should be given regardless of whether they were appropriate or to be used. These often appear to be following use of a software package. This type of work will only contribute to a mark of 1 or 2 unless accurate, appropriate, and interpreted in context.

Written Assessment

General

Some students did not appear to have access to their investigative task when this was done, and in some cases the teacher did not appear to have the investigation in order to confirm answers as either correct or otherwise.

Some centres appeared unsure as to what was required in a small number of questions. Centres are reminded that they each have a CA adviser to whom they can turn for help and advice.

CA1 Athletics

Question 1

The naming of diagrams was better than it has been on previous occasions.

Part (a)(i) was fairly well done.

Part (a)(ii) was better done than it has been in the past, but still many students are offering what the diagram does or shows and some centres are marking this as correct when not so.

In part (b)(i) quite a few students named a diagram they had already drawn, and in some centres this was marked as correct when it was not.

Part (b)(ii) some showed a lack of understanding as to what their diagram would have been used for.

Question 2

A lot of students did not appear to know what their population was.

The reasons given for representation of the population often referred to randomness or sample size.

Question 3

There were some good attempts, although once a valid problem had been identified many did not know how they had overcome it. Some appeared to have invented a problem as there was no evidence in the work to support the problem identified, and in some cases the problem was not possible in the work they had submitted.

Question 4

This was generally well done with many new variables stated and many hypotheses stated.

Question 5

Again this was well done as most managed to find a new variable, often either height or age.

Question 6

Some students gave a general advantage rather than answering the question.

Question 7

There were many good descriptions of inter-observer bias. The majority gave a valid solution.

Question 8

The majority recognised that time is continuous.

Question 9

In part (a) many appropriate hypotheses were seen.

Part (b) was answered well, in general, with many offering a measure of spread and a measure of average.

In part (c), again there were many good responses.

CA2 Cars

Question 1

The naming of diagrams was better than it has been on previous occasions.

Part (a)(i) was fairly well done.

Part (a)(ii) was better done than it has been in the past, but still many students are offering what the diagram does or shows and some centres are marking this as correct when not so.

In part (b)(i) a significant number of students named a diagram they had already drawn, and in some centres this was marked as correct when it was not.

In part (b)(ii) some students showed a lack of understanding as to what their diagram would have been used for.

Question 2

Evaluation is a very weak skill for many students. This was clearly shown in the distribution of marks in this question. Many gained 1 mark for a weak attempt at evaluation but few gained 2 or 3 marks.

Question 3

This question was very well done.

Question 4

Many appreciated that the size of the school would cause a problem for sampling to take place. As in Athletics, some students gave a general advantage of a census rather than answering the question.

Question 5

This question was fairly well done with many identifying the problem with colour and giving a valid solution. There were many correct answers for part (b), often giving rear door / boot as a problem. Some thought that mistakes in rounding the mileage was a problem.

Question 6

Many correctly identified pie charts.

Question 7

There were many good responses to part (a) although part (b) was less well done with many stating what it would show rather than why it was appropriate. Some centres seemed to be well prepared for this question.

Question 8

Most students gave a valid hypothesis, but then offered a measure of spread rather than a measure of average.

Mark Range and Award of Grades

Grade boundaries are available on the Results statistics page of the AQA Website.

UMS conversion calculator www.aqa.org.uk/umsconversion