AQA GCSE Mathematics Specification B

Module 2: Statistics Coursework

Read All About It

Overview

In your statistical coursework you will need to:

- Provide a well considered hypothesis and provide a plan of action to carry out the task.
- Decide what data is needed and collect results for the task using an appropriate sample size and sampling method.
- Consider the most appropriate way to represent your results and write down any observations you make.
- Consider the most appropriate statistical calculations to use and interpret your findings in terms of the original hypothesis.
- Develop the task by asking your own questions – you may need to collect further data to move the task on.
- Extend the task by using techniques and calculations from the content of your tier (Foundation, Intermediate or Higher).
- Make you conclusions clear – always link them to your original hypothesis recognising limitations and suggesting improvements.

In addition, your project should be written or typed on A4 paper and have numbered pages, a title page and a contents page. You do not have to word process your project, although it may help you to edit and alter it as you go along. It is quite acceptable that calculations and diagrams are generated by computer, as long as any such work is accompanied by some analysis and interpretation.

You should make the most of the lesson time provided to do your coursework as your teacher will be able to help and guide you. Plan your time carefully and do not leave everything until the last minute. Write your report as you go along – it will be easier and more accurate than trying to remember what you did at the end.

Remember, the coursework you submit must be your own. If you copy from someone else then you may be disqualified from the examination.

The Three Strands

This piece of coursework is marked under three headings. The three headings generally relate to three major sections of your coursework.

1. Specifying the problem and planning

This strand is about deciding what needs to be done and how you will do it. The strand requires you to provide clear aims, consider the collection of data, identify practical problems and explain how you might overcome them.

For the higher marks you need to decide upon a suitable sampling method, explain what steps were taken to avoid possible bias and provide a well structured report.

In this section, you need to:

> "My hypothesis is that word lengths in a magazine will be shorter on average that word lengths in a newspapers. I think this because…"

- Explain the task.
- State which magazine / newspapers you are using and why.
- State your hypothesis about word length (a statement that explains what you expect to find out). For the higher marks, you need another hypothesis to investigate – for example, you could look at the number of pictures or adverts
- Explain how you are going to choose the pages/articles. Will you use a particular sampling method? How will you make sure your samples are not **biased** and are **representative** of the whole newspaper/magazine?
- How many words will you count? Why is this a good **sample size**?
- How will you collect your data? (e.g. in a tally chart).
- What problems do you think you might encounter? (e.g. chosen page having no words to count, numbers or hyphenated words in the text etc.)

2. Collecting, processing and representing the data

This strand is about collecting data and using appropriate techniques and calculations to process and represent the data. Diagrams should be appropriate and calculations mostly correct.

For the higher marks you will need to accurately use higher level statistical techniques and calculations.

It is up to you exactly what you do in this section and will depend on the hypotheses that you are investigating. However it is likely you will include the following:

> **Important!**
>
> Every time you do something in this section, you must explain why you are doing it, how it will help you test your hypothesis and then, afterwards, what you have found out.

- Your raw data, probably in tally charts.
- Bar Charts / Frequency Polygons for each sample – what do these tell you about the **distribution** of word lengths?
- Mean, median, mode and range for each sample and a comparison table to show all the figures. What do these figures tell you? Do the figures show your hypothesis is correct?
  *For the higher marks, you should find out about **standard deviation** and use this to compare your samples.*
- Cumulative Frequency tables and graphs (you must group your data first)
- Box-and-whisker diagrams and calculation of the inter-quartile range
- Comparison of the box-and-whisker diagrams (you could re-draw them one underneath the other so they are easier to compare). For example, where are the middle 50% of the words? What does this tell you?
- Calculations / charts to test your other hypothesis / hypotheses as necessary.

> **Remember!**
>
> You should only use appropriate diagrams and graphs – if there is no reason for a particular diagram then you will not earn any marks for it.

3. Interpreting and discussing the results

This strand is about commenting, summarising and interpreting your data. Your discussion should link back to the original problem and provide an evaluation of the work undertaken.

For the higher marks you will need to provide sophisticated and rigorous interpretations of your data and provide an analysis of how significant your findings are.

Marks for this strand can be gained throughout your project for your comments and interpretations of calculations and diagrams. Your final conclusion should contain the following:

- Was your hypothesis correct? How do you know? (If you have already said this in section 2, then repeat it)
  (e.g. "My bar charts on page … showed that …")
- Relate your findings back to the original problem – have you answered the original task?
- Evaluate your strategy
  - What could you have done better / differently? What other factors could you have looked at to compare the newspaper/magazine?
  - What problems did you face that you didn't anticipate?
  - What were the limitations of your strategy? (e.g. sample size, sampling methods, biased data). How do the limitations affect the significance of your results?

Grade Criteria

These are the grade criteria your coursework will be marked by:

Foundation statistical task (grade E/F)

To achieve this level you must:
- Set out reasonably clear aims and include a plan.
- Ensure that the sample size is of an appropriate size.
- Collect data and make use of statistical techniques and calculations. For example: pie charts, bar charts, stem and leaf diagrams, mean, median, mode.
- Summarise and interpret some of your diagrams and calculations.

Intermediate statistical task (grade C)

To achieve this level you must:
- Set out clear aims and include a plan designed to meet those aims.
- Ensure that the sample size is of an appropriate size.
- Give reasons for your choice of sample.
- Collect data and make use of statistical techniques and calculations. For example: pie charts, bar charts, stem and leaf diagrams, mean, median, mode (of grouped data), cumulative frequency.
- Summarise and correctly interpret your diagrams and calculations.
- Consider your strategies and how successful they were.

Higher statistical task (grade A)

To achieve this level you must:
- Set out clear aims for a more demanding problem.
- Include a plan which is specifically designed to meet those aims.
- Ensure that sample size is considered and limitations discussed.
- Collect relevant data and use statistical techniques and calculations. For example: pie charts, bar charts, stem and leaf diagrams, mean, median, mode (of grouped data), cumulative frequency, histograms and sampling techniques.
- Summarise and correctly interpret your diagrams and calculations.
- Use your results to respond to your original question.
- Consider your strategies, limitations and suggest possible improvements.