

## Improving your GCSE coursework: mathematics handling data

Coursework in mathematics is worth 20% of the GCSE examination marks. To make sure you gain the best possible marks for your GCSE handling data coursework project you need to think about the following points. It is important that you also make it clear to an examiner how you have considered them and what you decided. Some of the elements in this leaflet may not be relevant to your piece of coursework and so only do them if it is appropriate.

After you have planned your coursework, check with your teacher to make sure the work is appropriate and it will enable you to get a good mark.

<b>Specifying the problem and planning</b>	
Be careful when planning your work. You need to be able to show appropriate skills in all elements of the handling data cycle to get the best marks.	
<b>Have you:</b>	<b>For example:</b>
Explained what you are hoping to achieve?	<i>State a hypothesis, and make it clear what it is you are trying to find out and why you have decided to collect data or perform an experiment.</i>
Checked that you will be able to complete your task at an appropriate level?	<i>Will you be able to calculate the mean and median of discrete and continuous data if appropriate?</i>
Explained how you are going to collect your data and why you have chosen this particular way?	<i>Why have you used a particular sampling technique (stratified, random ...), why have you chosen your sample size (is it large enough to eliminate bias?), how will you collate your data (two-way table, frequency chart ...), and how will this enable you to answer your problem?</i>
Considered any problems you may encounter and how you intend to overcome these?	<i>Estimating a 60% return for a questionnaire, or repeating an experiment three times and averaging the results to get a fairer result.</i>
Related your plan back to the original problem to check that it will allow you to find a result and answer the problem?	<i>Check that you have planned to collect appropriate data or to perform an experiment which will allow you to answer what you set out to show. Ask your teacher to check if your plan for the work is appropriate for you.</i>

### Collecting, processing and representing

Make sure your work uses appropriate and relevant techniques. It is important that you explain what you have done and why, and how this relates to the problem you are addressing. Avoid performing many different techniques that do not relate to each other and are not relevant to your problem.

Have you:	For example:
Collected relevant and reliable data?	<i>Are all your data relevant to your problem or have you collected some which are not needed? Can you be sure, and can you justify, that your data are not biased and represent the population from which they were derived?</i>
Worked on your data to demonstrate statistical processes which are appropriate to the problem?	<i>Calculating the mean and median using a grouped frequency table with continuous data; a frequency polygon; a scatter diagram with a line of best fit; considering a measure of dispersion (range, semi-interquartile range ...) as well as the mean, median or mode; drawing stem and leaf diagrams; box plots, percentage bar charts and other appropriate diagrams.</i>
Explained why you have chosen the diagram or calculation and justified how it helps answer your problem?	<i>Saying that you have used a dual bar chart to show the different responses from girls and boys.</i>
Shown you understand the applications and have used them appropriately when using ICT to support your work?	<i>Using a spreadsheet to collate information in a clear and concise way; drawing only appropriate diagrams; calculating the mean of a grouped frequency table.</i>
Demonstrated some high-level skills which are appropriate to your work and which you can explain fully?	<i>Using a cumulative frequency diagram to calculate the median and interquartile range and then comparing two distributions with these measures.</i>

Interpreting and discussing results	
Have you:	For example:
Related your results to your original problem?	<i>Explaining how your results support, or disprove, your original hypothesis, giving reasons for your findings, and explaining any exceptions or inconsistencies.</i>
Explained what seems to be significant about your results?	<i>Explaining that gender has an impact upon the results but age does not seem to be relevant.</i>
Commented about any possible bias that may have affected the results?	<i>Saying that the results are biased because your sample was not random and did not reflect the true population.</i>
Considered and commented upon what you would do differently if you were to repeat the work?	<i>Reflecting that because you did not use equal-sized class intervals to record data, you were not able to compare one interval with another and this invalidated part of your work.</i>

## Overall

When you have finished, look back over the complete piece of work and check the following:

- Does each element make sense and link to other parts of the work?
- Have you given reasons for your choices and reflected upon these choices?
- Have you used strategies and work which match the level of work you are aiming for?
- Have you made sure any graphs and calculations are relevant, and have you used the correct mathematical language?
- Have you made sure all calculations are correct and it is clear how they have been worked out, especially if you have used ICT in your work?

Get someone to read your work. A parent or carer might help. Ask them to listen to you explain what you have done and why you have done it. Do they have any questions about points that they don't understand? When you have explained them, ask whether your written explanation is as detailed as your verbal explanation. Read your written work again. Can you now improve on what you have written? Remember, you can ask what another person thinks about your work but the work must be entirely your own.