



Qualifications and
Curriculum Authority



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



GCSE subject criteria for statistics

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Introduction

1. GCSE subject criteria set out the knowledge, understanding, skills and assessment objectives common to all GCSE specifications in statistics. They provide the framework within which an awarding body creates the detail of the specification.
2. Specifications must also meet the regulators' general requirements, including the common and GCSE criteria as defined in *The statutory regulation of external qualifications* (QCA/04/1293).
3. Subject criteria are intended to:
 - help ensure consistent and comparable standards in the same subject across the awarding bodies
 - ensure that the rigour of GCSE is maintained
 - ensure that specifications build on the knowledge, understanding and skills established by the national curricula for England, Northern Ireland and Wales, and facilitate progression to further study of statistics
 - help higher education institutions, employers and other stakeholders such as learners and parents/guardians know what has been studied and assessed.
4. Any GCSE specification that contains significant elements of statistics must be consistent with the relevant parts of these subject criteria.

Aims and learning outcomes

5. GCSE specifications in statistics should encourage learners to be inspired, moved and changed by following a broad, coherent, satisfying and worthwhile course of study and gain an insight into related sectors, such as mathematics. They should prepare learners to make informed decisions about further learning opportunities and career choices.
6. GCSE specifications in statistics must enable learners to:
 - actively engage in the process of enquiry to develop as effective and independent learners, and as critical and reflective thinkers with enquiring minds
 - acquire an understanding of the basic concepts of statistical problem-solving in a way that encourages confidence and enjoyment of the subject in everyday and real-life situations and out-of-classroom learning

- develop knowledge, skills and understanding in statistical methods and concepts and in probability, including an awareness of the potential and limitations of data and methods
- develop an understanding of the importance of statistical information to society as a whole as well as its limitations, including recognising misleading representations and uses of statistics.

Subject content

7. The content of GCSE specifications in statistics must reflect the learning outcomes.
8. GCSE specifications in statistics must allow learners to develop the knowledge, skills and understanding specified below.
9. A specification must address the data handling component of the programmes of study for mathematics from the relevant national curriculum orders for England and/or Wales and the statutory requirements for key stage 4 in Northern Ireland.
10. Any specification must require learners to develop an understanding of, and an ability to apply the statistical problem-solving process, which involves:
 - planning
 - collecting data
 - processing, presenting and analysing data
 - discussing and interpreting results
 - communicating in a variety of forms, including the use of ICT.
11. Planning a statistical investigation:
 - determining the nature of the requirements of the situation
 - identifying questions and hypotheses
 - design a study while showing awareness of other approaches.
12. The nature of data:
 - being aware of different types of data

- recognising the contexts in which these arise.

13. Probability:

- measuring chance and likelihood
- being aware of uncertainty and risk
- being aware of the use of probability to model real-life situations.

14. Collecting data:

- understanding the concepts of populations and samples
- understanding the importance of collecting appropriate data and the problem of bias
- knowing different types of sampling
- knowing different data collection methods.

15. Processing, analysing and presenting data:

- understanding that data can be processed and presented in different ways
- recognising that some methods are more appropriate/effective than others
- appreciating that misuse of presentation methods can distort outcomes
- producing summary statistics, tables and diagrams appropriate to the context and to the questions posed.

16. Interpretation and discussion of results:

- applying statistical reasoning to answer the questions posed
- using summary statistics, tables and diagrams to draw inferences or conclusions
- interpreting inferences and conclusions in the context of the questions posed.
- understanding reliability and limitations of inferences or conclusions.
- evaluating the reliability and limitations of the strategy used.

Assessment objectives

17. All specifications must require candidates to demonstrate their ability to:

Assessment objectives		% weighting
AO1	Analyse a statistical problem and plan an appropriate strategy	10–20
AO2	Describe and use appropriate methods to select and collect data	10–20
AO3	Process, analyse and present data appropriately	40–50
AO4	Use statistical evidence to identify inferences, make deductions and draw conclusions	25–35

Scheme of assessment

18. GCSE specifications in statistics must allocate a weighting of 75% to external assessment and a weighting of 25% to controlled assessment in the overall scheme of assessment.

19. Question papers in statistics must be targeted at either Foundation or Higher tier.

Grade descriptions

20. Grade descriptions are provided to give a general indication of the standards of achievement likely to have been shown by candidates awarded particular grades. The descriptions must be interpreted in relation to the content in the specification; they are not designed to define that content.

21. The grade awarded will depend in practice upon the extent to which the candidate has met the assessment objectives overall. Shortcomings in some aspects of candidates' performance in the assessment may be balanced by better performances in others.

Grade	Description
A	<p>Candidates analyse statistical problems and use appropriate strategies to conduct a statistical investigation. They identify and specify research questions and hypotheses that are appropriate to the context. They plan and execute a statistical investigation, working through the statistical problem-solving process accurately and rigorously, justifying their chosen approaches.</p> <p>They use data collection methods appropriate to the context and recognise their limitations. They understand different types of data, the concepts of a population and different methods of sampling. They understand bias and how it might arise. They use probability to model real-life situations.</p> <p>They select from a range of different methods to process and analyse data accurately and effectively. They recognise that some methods are more appropriate than others and can rationalise their choices. They understand and can illustrate how different representations and statistics may distort outcomes. They review their work, identify their errors and correct them. They are able to overcome minor difficulties in their investigations.</p> <p>They apply statistical reasoning, using evidence to draw sensible inferences. They make deductions and communicate complex conclusions in an understandable way, using an appropriate mixture of writing and suitable tabular and graphical methods. They read and interpret published tables of secondary data and identify the major features. They use interpolation and extrapolation sensibly. They compare actual with expected frequencies and draw appropriate conclusions. Their accurate conclusions are securely based on data and relevant to the original question or hypothesis.</p>

C	<p>Candidates work through the statistical problem-solving process, selecting appropriate statistical methods and drawing conclusions that are relevant to their original question or hypothesis.</p> <p>They plan for and use different methods for collecting data. They understand the problem of bias and can use different methods of sampling. They understand that different outcomes may result from repeating an experiment. They can use probability to model simple, real-life situations.</p> <p>They process and analyse data accurately using different methods. They recognise the advantages and disadvantages of different methods. They can identify how different representations can distort outcomes.</p> <p>They draw inferences and communicate conclusions in writing, tabular and graphical forms. They read and interpret tables of secondary data, including tables involving percentages. They recognise that the reliability of results can be affected by the size of a sample or data. Their conclusions are usually correct.</p>
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F	<p>Candidates work through the statistical problem-solving process using suitable statistical methods and drawing simple conclusions that are relevant to their original question.</p> <p>They use suitable methods for collecting data. They understand the importance of using a suitably large sample when the entire population cannot be investigated. They understand that different outcomes may result from repeating an experiment. They have some knowledge of probability.</p> <p>They use some methods for analysing and processing data accurately. They select methods to present straightforward, simple data. They may need some support to complete their investigations.</p> <p>They use evidence to draw simple conclusions, which they communicate in writing and by using tabular and graphical presentation. They read frequency tables, bar charts, pie charts, line graphs and scatter diagrams.</p>
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