

GCE Subject Level Guidance for Statistics

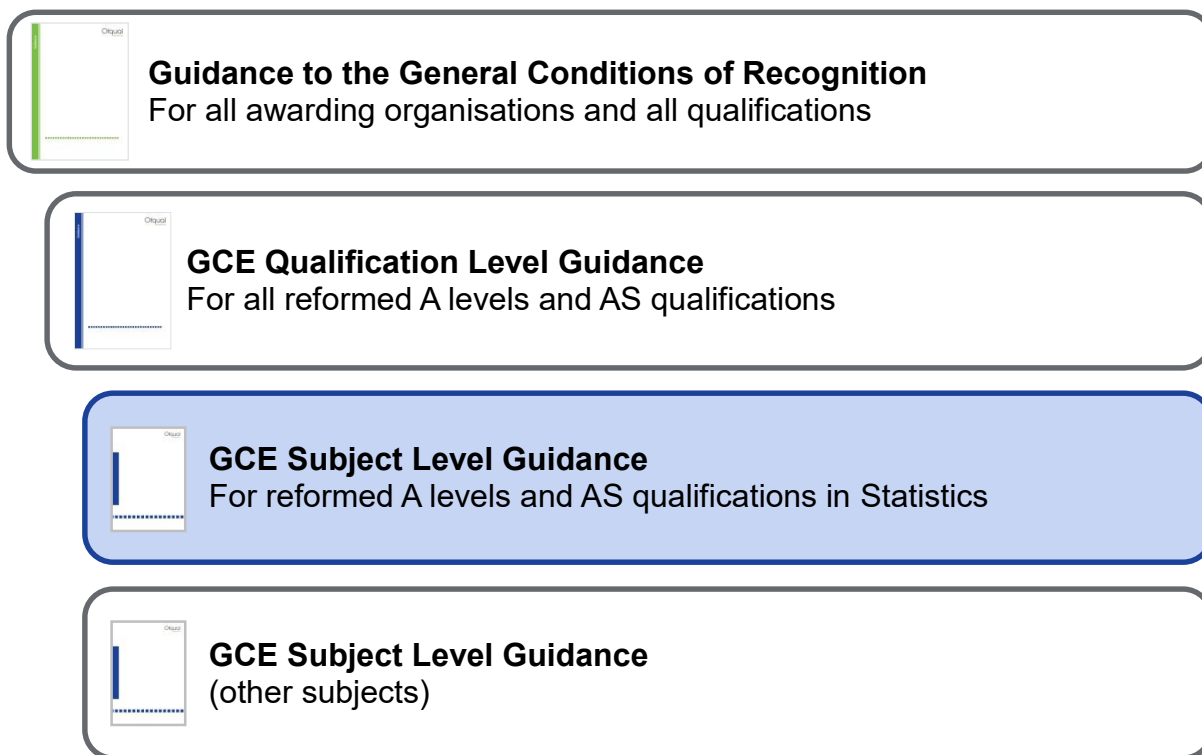
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Introduction

This document (highlighted in the figure below) is part of a suite of documents which outlines our guidance for awarding organisations offering GCE Qualifications.



This document sets out guidance which applies to the following qualifications:

- all GCE A levels in Statistics awarded on or after 1 April 2019; and
- all standalone GCE AS qualifications in Statistics awarded on or after 1 April 2018.

This guidance supports the *GCE Subject Level Conditions and Requirements for Statistics*.¹

This document constitutes guidance for the purposes of section 153 of the Apprenticeships, Skills, Children and Learning Act 2009 (the '2009 Act') and Condition GCE(Statistics)1.

An awarding organisation has a legal obligation under the 2009 Act to have regard to this guidance, where relevant, in relation to each GCE Qualification in Statistics that it makes available or proposes to make available. Condition GCE(Statistics)1 imposes

¹ www.gov.uk/government/publications/gce-subject-level-conditions-and-requirements-for-statistics

the same obligation in respect of the guidance below which is issued under that Condition.

An awarding organisation should use the guidance in this document to help it understand how to comply with the *GCE Subject Level Conditions and Requirements for Statistics*.

Guidance set out in this document

This document provides guidance on assessment objectives for GCE Qualifications in Statistics.
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Guidance on assessment objectives for GCE Qualifications in Statistics

Condition GCE(Statistics)1.2 allows us to specify requirements and guidance relating to assessment objectives for GCE Qualifications in Statistics.

We published our requirements in relation to assessment objectives in *GCE Subject Level Conditions and Requirements for Statistics*, and reproduce them in the table below.

	Objective	Weighting (A level)	Weighting (AS)
AO1	Demonstrate knowledge and understanding, using appropriate terminology and notation, of standard statistical techniques used – <ul style="list-style-type: none"> ■ to collect and represent data ■ to calculate summary statistics and probabilities ■ in relation to hypotheses and inference. 	55%	55%
AO2	Interpret statistical information and results in context and reason statistically to make predictions, construct arguments, make decisions and draw conclusions.	25%	25%
AO3	Critically assess the reliability and validity of statistical methodologies and the conclusions drawn through the application of the statistical enquiry cycle.	20%	20%

We set out below our guidance for the purposes of Condition GCE(Statistics)1.2. This guidance explains how we expect awarding organisations to interpret these assessment objectives in terms of:

- the different ‘strands’ within each of the assessment objectives;
- the discrete ‘elements’ within each assessment objective and its strands that questions and tasks could target and/or seek to credit – our expectation is that each and every question/task should target or seek to credit at least one of these elements, and may target or seek to credit multiple elements across one or more assessment objectives;

- the coverage expectations, such as in relation to the different elements within each assessment objective and how those elements should be sampled over time; and
- the key areas of emphasis in each assessment objective and the particular meaning for the subject of any key terms and phrases used; defined terms are shown in bold text, followed by their definitions.

In line with the obligations set out in Condition GCE(Statistics)1.2, we expect awarding organisations to be able to demonstrate how they have had regard to this guidance. For example, an awarding organisation could map how it has regard to the guidance as it:

- develops its sample assessment materials;
- delivers the qualification;
- develops and applies its approach to sampling the elements into which the assessment objectives are divided; and
- monitors the qualification to make sure it addresses all elements appropriately.

AO1: Demonstrate knowledge and understanding, using appropriate terminology and notation, of standard statistical techniques used –		55% (A level) 55% (AS)	
		<ul style="list-style-type: none"> ▪ to collect and represent data ▪ to calculate summary statistics and probabilities ▪ in relation to hypotheses and inference 	
Strands	Elements	Coverage	Interpretations and definitions
1 – Demonstrate knowledge and understanding, using appropriate terminology and notation, of standard statistical techniques used to collect and represent data	This strand is a single element	<ul style="list-style-type: none"> ▪ Full coverage in each set of assessments² (but not in every assessment). ▪ A reasonable balance between the strands within this assessment objective. ▪ Awarding organisations should justify the balance 	<ul style="list-style-type: none"> ▪ Standard statistical techniques means the techniques set out in the document published by the Secretary of State entitled ‘Statistics GCE AS and A level subject content’, reference DFE-00059-2016 (the ‘Content Document’). ▪ These techniques should be understood, but need not always be assessed, in terms of their place in the statistical enquiry cycle outlined in appendix 4 to the Content Document. ▪ Tasks may be broken down into a number of steps or parts, provided this does not undermine the expectation that Learners should demonstrate their ability to understand that the statistical enquiry cycle is a coherent whole. ▪ Notation refers to standard statistical notation, rather than to any notation related to specific software tools.
2 – Demonstrate knowledge and understanding, using appropriate terminology and notation, of standard statistical techniques used to calculate summary statistics and probabilities	This strand is a single element		

² For the purposes of this guidance, a ‘set of assessments’ means the assessments to be taken by a particular Learner for a GCE Qualification in Statistics. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.

AO1: Demonstrate knowledge and understanding, using appropriate terminology and notation, of standard statistical techniques used –		55% (A level) 55% (AS)	
<ul style="list-style-type: none"> ▪ to collect and represent data ▪ to calculate summary statistics and probabilities ▪ in relation to hypotheses and inference 			
Strands	Elements	Coverage	Interpretations and definitions
3 – Demonstrate knowledge and understanding, using appropriate terminology and notation, of standard statistical techniques used in relation to hypotheses and inference	This strand is a single element	between strands in their assessment strategies.	<ul style="list-style-type: none"> ▪ The correct use of appropriate terminology and notation may not necessarily be rewarded in isolation, but would be expected to be used as appropriate in all responses. ▪ Learners should be expected to use statistical functions on their calculators where appropriate during the assessment. This does not prevent awarding organisations setting questions/tasks which require Learners to apply one or more specific formulae manually.

AO2: Interpret statistical information and results in context and reason statistically to make predictions, construct arguments, make decisions and draw conclusions.		25% (A level) 25% (AS)	
Strands	Elements	Coverage	Interpretations and definitions
n/a	<p>1a – Interpret statistical information and results in context</p> <hr/> <p>1b – reason statistically to make predictions, construct arguments, make decisions and draw conclusions</p>	<ul style="list-style-type: none"> ■ Full coverage in each set of assessments (but not in every assessment). ■ A reasonable balance between the elements within this assessment objective. ■ Awarding organisations should justify the balance between elements in their assessment strategies. ■ Each set of assessments – <ul style="list-style-type: none"> □ should include questions/tasks which target AO2 using results given in the question/task, and using results calculated by the Learner as part of the question/task □ need not target every combination of elements 1a and 1b with each of given results and calculated results. 	<ul style="list-style-type: none"> ■ Interpret statistical information and results in context means relating information and/or results to the context provided in the question/task – for example by showing what they mean in that specific context or situation. It does not extend to making judgements about the strengths and weaknesses of a chosen methodology or conclusion, which is part of AO3. ■ Reason statistically means forming a statistical judgement using appropriate statistical terminology. This may be linked to, or independent of, element 1a. So, for example, it might relate to the meaning of a result in context, or to determining a methodology to use. It does not extend to making judgements about the strengths and weaknesses of a chosen methodology or conclusion, which is part of AO3. ■ The processes referred to in these elements should be understood, but need not always be assessed, in terms of their place in the statistical enquiry cycle outlined in appendix 4 to the Content Document.

AO3: Critically assess the reliability and validity of statistical methodologies and the conclusions drawn through the application of the statistical enquiry cycle.		20% (A level) 20% (AS)	
Strands	Elements	Coverage	Interpretations and definitions
n/a	<p>1a – Critically assess the reliability and validity of statistical methodologies</p> <p>1b – Critically assess the reliability and validity of the conclusions drawn through the application of the statistical enquiry cycle</p>	<ul style="list-style-type: none"> ■ Full coverage in each set of assessments (but not in every assessment). ■ A reasonable balance between the elements within this assessment objective. ■ Awarding organisations should justify the balance between elements in their assessment strategies. 	<ul style="list-style-type: none"> ■ In the context of this assessment objective – <ul style="list-style-type: none"> □ critically assess means to make a judgement as to the strengths and weaknesses of a methodology or conclusion □ reliability means the extent to which an experiment or procedure produces the same, or compatible results on repeated trials □ validity means the extent to which a tool or procedure measures what it is designed to measure □ statistical methodologies refers to the theoretical analysis of the statistical techniques applied during the statistical enquiry cycle. □ conclusions refers to a statistical judgement or judgements that a Learner would respond to and/or evaluate. ■ These statistical methodologies and conclusions might be provided in the question/task, or have been generated by the Learner as part of AO2.

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