

# **GCSE Subject Level Guidance for Single Science (Biology, Chemistry, Physics)**

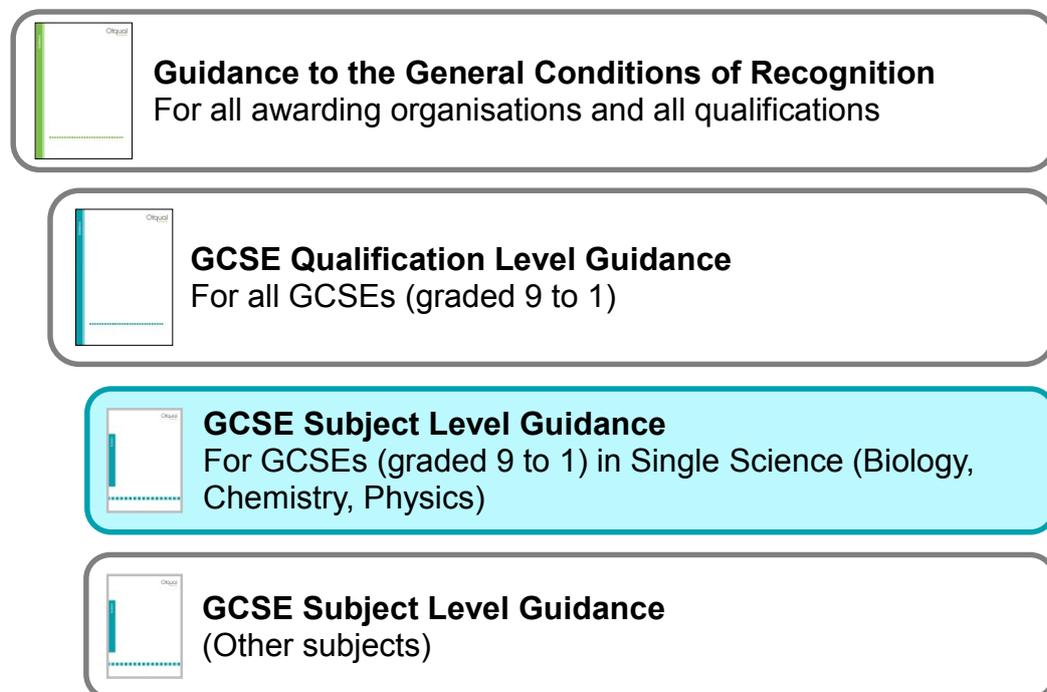
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# Contents

Introduction.....	2
Guidance set out in this document.....	3
Guidance on assessment objectives for GCSE Qualifications in Biology, Chemistry and Physics .....	4

## Introduction

This document (highlighted in the figure below) is part of a suite of documents which outlines our guidance for awarding organisations offering GCSE qualifications (graded 9 to 1).



This document sets out guidance which applies to all GCSE Qualifications (graded from 9 to 1) in Biology, Chemistry and Physics. It supports the *GCSE Subject Level Conditions and Requirements for Single Science (Biology, Chemistry, Physics)*.<sup>1</sup>

This document constitutes guidance for the purposes of section 153 of the Apprenticeships, Skills, Children and Learning Act 2009 (the '2009 Act') and Condition GCSE(Single Science)<sup>1</sup>.

An awarding organisation has a legal obligation under the 2009 Act to have regard to this guidance, where relevant, in relation to each GCSE Qualification in Biology, Chemistry or Physics that it makes available or proposes to make available. Condition GCSE(Single Science)<sup>1</sup> imposes the same obligation in respect of the guidance below which is issued under that Condition.

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<sup>1</sup> [www.gov.uk/government/publications/gcse-9-to-1-subject-level-conditions-and-requirements-for-single-science](http://www.gov.uk/government/publications/gcse-9-to-1-subject-level-conditions-and-requirements-for-single-science)

An awarding organisation should use the guidance in this document to help it understand how to comply with the *GCSE Subject Level Conditions and Requirements for Single Science (Biology, Chemistry, Physics)*.

## **Guidance set out in this document**

<p>This document provides guidance on assessment objectives for GCSE Qualifications (graded 9 to 1) in Biology, Chemistry and Physics.</p>
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## Guidance on assessment objectives for GCSE Qualifications in Biology, Chemistry and Physics

Condition GCSE(Single Science)1.2 allows us to specify requirements and guidance relating to assessment objectives for GCSE Qualifications in Biology, Chemistry or Physics.

We published our requirements in relation to assessment objectives in *GCSE Subject Level Conditions and Requirements for Single Science (Biology, Chemistry, Physics)*, and reproduce them in the table below.

	Objective	Weighting
AO1	Demonstrate knowledge and understanding of: <ul style="list-style-type: none"> <li>■ scientific ideas</li> <li>■ scientific techniques and procedures.</li> </ul>	40%
AO2	Apply knowledge and understanding of: <ul style="list-style-type: none"> <li>■ scientific ideas</li> <li>■ scientific enquiry, techniques and procedures.</li> </ul>	40%
AO3	Analyse information and ideas to: <ul style="list-style-type: none"> <li>■ interpret and evaluate</li> <li>■ make judgements and draw conclusions</li> <li>■ develop and improve experimental procedures.</li> </ul>	20%

We set out below our guidance for the purposes of Condition GCSE(Single Science)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;

- 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 GCSE(Single Science)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 of: <ul style="list-style-type: none"> <li>■ scientific ideas</li> <li>■ scientific techniques and procedures.</li> </ul>			40%
Strands	Elements	Coverage	Interpretations and definitions
<b>1 – Demonstrate knowledge and understanding of scientific ideas.</b>	This strand is a single element.	<ul style="list-style-type: none"> <li>■ Full coverage in each set of assessments<sup>2</sup> (but not in every assessment).</li> <li>■ No more than 15% of the total marks for the qualification should reward demonstrating knowledge in isolation.<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Scientific ideas</b> are aspects of the subject content. They include the subject-specific requirements and the requirements for Working Scientifically as set out in the Content Document – for example, theories, models, methods and how these develop over time, as well as recall of mathematical formulae and units.</li> <li>■ <b>Scientific techniques and procedures</b> encompasses, but is broader than, knowledge and understanding of the core practical activities. In the context of this assessment objective, it involves the knowledge and understanding of such techniques and procedures.</li> <li>■ The emphasis in this assessment objective is on Learners recalling and communicating relevant knowledge and understanding from the course of study – for example, facts, definitions, explanations, how to do something and why it should be done in a particular way.</li> </ul>
<b>2 – Demonstrate knowledge and understanding of scientific techniques and procedures.</b>	This strand is a single element.		

<sup>2</sup> For the purposes of this guidance, a ‘set of assessments’ means the assessments to be taken by a particular Learner for a GCSE Qualification in Biology, Chemistry or Physics. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.

<sup>3</sup> Marks which ‘reward demonstrating knowledge in isolation’ means any mark awarded solely for recalling facts or other knowledge that is part of the specification. It does not include marks awarded for selecting appropriate knowledge (for example, to evidence an argument), or for applying knowledge to a particular context.

AO2: Apply knowledge and understanding of:			40%
<ul style="list-style-type: none"> <li>■ scientific ideas</li> <li>■ scientific enquiry, techniques and procedures.</li> </ul>			
Strands	Elements	Coverage	Interpretations and definitions
<b>1 – Apply knowledge and understanding of scientific ideas.</b>	This strand is a single element.	<ul style="list-style-type: none"> <li>■ Full coverage in each set of assessments (but not in every assessment).</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Scientific ideas</b> are aspects of the subject content. They include the subject-specific requirements and the requirements for Working Scientifically as set out in the Content Document – for example, theories, models and the use of relevant mathematics.</li> <li>■ <b>Scientific enquiry, techniques and procedures</b> encompasses, but is broader than, knowledge and understanding of the core practical activities. In the context of this assessment objective, it involves applying such knowledge and understanding to a given context.</li> <li>■ The emphasis in this assessment objective is on Learners applying their knowledge and understanding to provide meaning or explanation – for instance, to connect theory with particular contexts, stimuli or materials. This application should relate principally to: <ul style="list-style-type: none"> <li>□ novel situations that are not clearly indicated in the specification;</li> <li>□ developing further material that is covered in the specification;</li> <li>□ making links between such types of material, which are not signalled in the specification.</li> </ul> </li> <li>■ Application of knowledge should also involve determining how to make sense of connections and linkages within data, information and detail – although not to the extent of drawing conclusions or making judgements.</li> </ul>
<b>2 – Apply knowledge and understanding of scientific enquiry, techniques and procedures.</b>	This strand is a single element.		

AO3: Analyse information and ideas to:			20%
<ul style="list-style-type: none"> <li>■ interpret and evaluate</li> <li>■ make judgements and draw conclusions</li> <li>■ develop and improve experimental procedures.</li> </ul>			
Strands	Elements	Coverage	Interpretations and definitions
<b>1 – Analyse information and ideas to interpret and evaluate.</b>	1a – Analyse information and ideas to interpret.	<ul style="list-style-type: none"> <li>■ Full coverage in each set of assessments (but not in every assessment).</li> <li>■ A reasonable balance between the strands within this assessment objective, and between the elements within each strand.</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Develop and improve</b> covers a range of approaches to assessment, including questions related to adapting, modifying and enhancing experimental procedures. Learners should not be expected to develop their own procedures.</li> <li>■ <b>Experimental procedures</b> encompasses, but is broader than, the core practical activities. In the context of this assessment objective, questions/tasks should take an analytical form such as suggesting the limitations of a particular method.</li> <li>■ The emphasis here is on the outcome that Learners produce through the analysis of information – for instance, the interpreting, evaluating, judgement, conclusion or modification/improvement of procedures that stems from their reasoning and synthesis of skills. The abilities to interpret and evaluate in this context are both linked and complementary.</li> <li>■ Questions/tasks should address a range of sources here – for example, written, numerical, theoretical, practical, ethical, social, economic and environmental.</li> </ul>
	1b – Analyse information and ideas to evaluate.		
<b>2 – Analyse information and ideas to make judgements and draw conclusions.</b>	2a – Analyse information and ideas to make judgements.		
	2b – Analyse information and ideas to draw conclusions.		
<b>3 – Analyse information and ideas to develop and improve experimental procedures.</b>	3a – Analyse information and ideas to develop experimental procedures.		
	3b – Analyse information and ideas to improve experimental procedures.		

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