Guidance

GCE Subject Level Guidance for Environmental Science

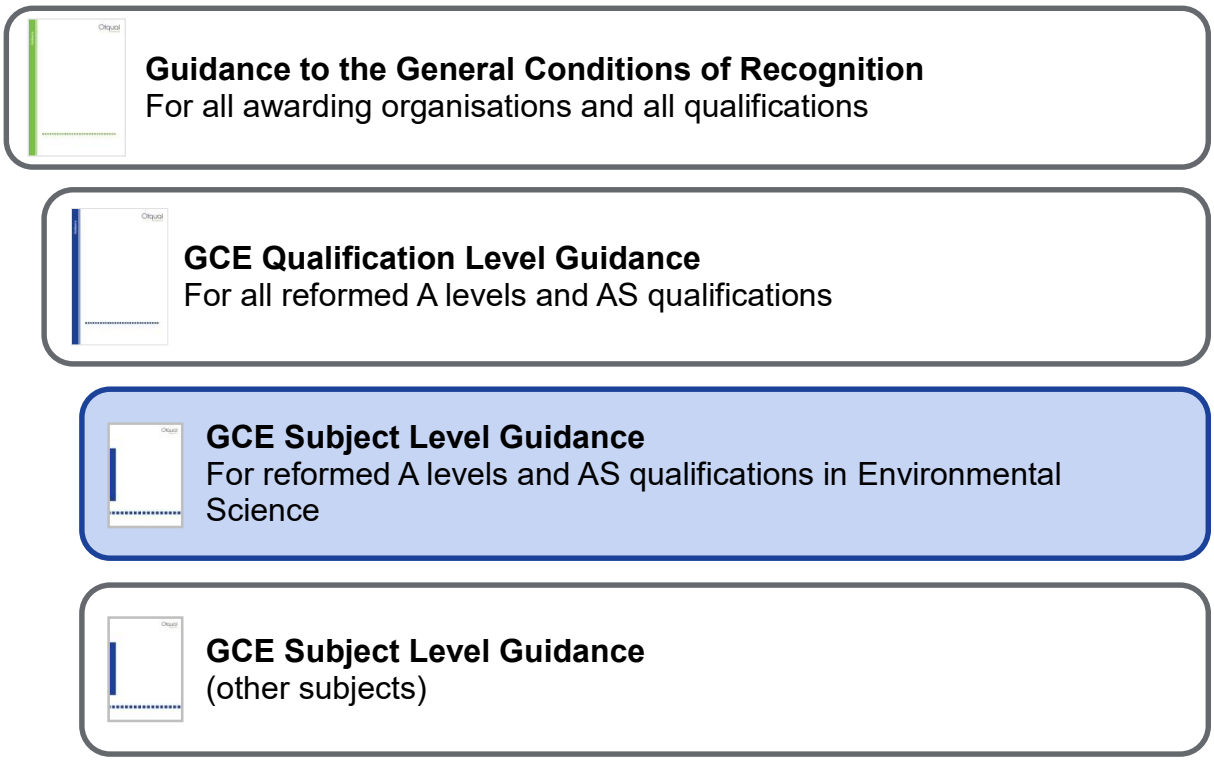
February 2016

Ofqual/16/5853

Contents

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 Environmental Science awarded on or after 1 April 2019; and
- all standalone GCE AS qualifications in Environmental Science awarded on or after 1 April 2018.

This guidance supports the *GCE Subject Level Conditions and Requirements for Environmental Science*[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(Environmental Science)1.

[1] www.gov.uk/government/publications/gce-subject-level-conditions-and-requirements-for-environmental-science

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 Environmental Science that it makes available or proposes to make available. Condition GCE(Environmental Science)1 imposes 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 Environmental Science*.

Guidance set out in this document

This document provides guidance on assessment objectives for GCE Qualifications in Environmental Science.

Guidance on assessment objectives for GCE Qualifications in Environmental Science

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

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

	Objective	Weighting (A level)	Weighting (AS)
AO1	Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues	*30-35%*	*35-40%*
AO2	Apply knowledge and understanding of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues	*40-45%*	*40-45%*
AO3	Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to environmental issues, to make judgements and draw conclusions.	*25-30%*	*20-25%*

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

- the discrete 'elements' within each assessment objective 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(Environmental 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.

<table>
<tr><th colspan="3">AO1: Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues</th><th>30-35% (A level)
35-40% (AS)</th></tr>
<tr><th>Strands</th><th>Elements</th><th>Coverage</th><th>Interpretation and definitions</th></tr>
<tr><td rowspan="2">n/a</td><td>1a – Demonstrate knowledge of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues</td><td rowspan="2">■ Full coverage in each set of assessments[2] (but not in every assessment)
■ A reasonable balance between elements in each set of assessments (but not in every assessment)
■ Awarding organisations should justify the balance between elements 1a and 1b in their assessment strategies
■ No more than 10% of the total marks for the qualification should reward demonstrating knowledge in isolation[3]</td><td rowspan="2">■ Both here and in AO2 –
□ scientific ideas, processes, techniques and procedures are aspects of subject content. Awarding organisations should explain their approach to targeting them in their assessment strategies
□ natural systems means the systems specified in paragraph 12 of the document published by the Secretary of State entitled ‘Environmental science GCE AS and A level subject content’, document reference DFE-00198-2015
□ natural processes means the biogeochemical events, pathways and reactions that transform material within natural systems
■ The emphasis in this assessment objective is on Learners recalling and communicating relevant knowledge and understanding from the course of study, including definitions, standard conceptual explanations, scientific techniques, environmental strategies and their rationale.</td></tr>
<tr><td>1b – Demonstrate understanding of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues</td></tr>
</table>

[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 Environmental Science. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.

[3] Marks which ‘reward demonstrating knowledge in isolation’ means any mark awarded solely for recalling facts or other knowledge. 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 scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues			*40-45% (A level)* *40-45% (AS)*
Strands	**Elements**	**Coverage**	**Interpretations and definitions**
n/a	This assessment objective is a single element	▪ Full coverage in each set of assessments (but not in every assessment).	▪ See guidance in relation to AO1 for definitions of **scientific ideas, processes, techniques and procedures**, **natural systems** and **natural processes**. ▪ Learners should be expected to apply their knowledge and understanding to stimulus and source material to provide meaning and explanations in particular contexts. This application should relate principally to developing further material that is covered in the specification by – ▫ exploring contexts and situations that are not explicitly indicated in the specification; ▫ making links between types of material which are not explicitly indicated in the specification ▪ Learners should also be expected to apply their knowledge and understanding to identify relationships within and between data and information, although not to the extent of reaching conclusions or making judgements (which would be covered under AO3). ▪ Questions/tasks should require evidence-based responses to assess active processing of knowledge and understanding.

<table>
<tr><th colspan="3">AO3: Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to environmental issues, to make judgements and draw conclusions</th><th>25-30% (A level)
20-25% (AS)</th></tr>
<tr><th>Strands</th><th>Elements</th><th>Coverage</th><th>Interpretations and definitions</th></tr>
<tr><td rowspan="3">n/a</td><td>1a – analyse scientific information, ideas and evidence, including in relation to environmental issues</td><td rowspan="3">■ Full coverage in each set of assessments (but not in every assessment).
■ A reasonable balance between elements in each set of assessments (but not in every assessment)
■ Awarding organisations should justify the balance between elements in their assessment strategies</td><td rowspan="3">■ Scientific information and evidence includes:
□ Evidence collected e.g. acquired evidence/information on which an idea/hypothesis is formulated, including experimental data, descriptive observations, images, theories, models and witness statements,
□ Evidence processed e.g. evidence/information used in planning to test ideas/hypotheses, explaining, interpreting, modelling, and
□ Evidence validated e.g. justifying conclusions/making value judgements based on evidence/information.
■ The emphasis here is on the outcome that Learners produce through the analysis of evidence, for instance the judgement or conclusion or development/refinement of design/procedures that stems from their reasoning and synthesis of skills
■ The abilities to interpret and evaluate in this context are both linked and complementary.
■ Questions/tasks should address a range of materials. However, an individual item could address a single type of information source.
■ Where Learners' conclusions relate to practical work, they should either involve refining practical design and procedures or developing/planning practical procedures to solve problems.</td></tr>
<tr><td>1b – interpret and evaluate scientific information, ideas and evidence, including in relation to environmental issues</td></tr>
<tr><td>1c – make judgements and draw conclusions</td></tr>
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Office of Qualifications and Examinations Regulation

Spring Place
Coventry Business Park
Herald Avenue
Coventry CV5 6UB

2nd Floor
Glendinning House
6 Murray Street
Belfast BT1 6DN

Telephone 0300 303 3344
Textphone 0300 303 3345
Helpline 0300 303 3346