

# **AS and A Level Environmental Science**

Consultation on Conditions and guidance



December 2015

Ofqual/15/5814

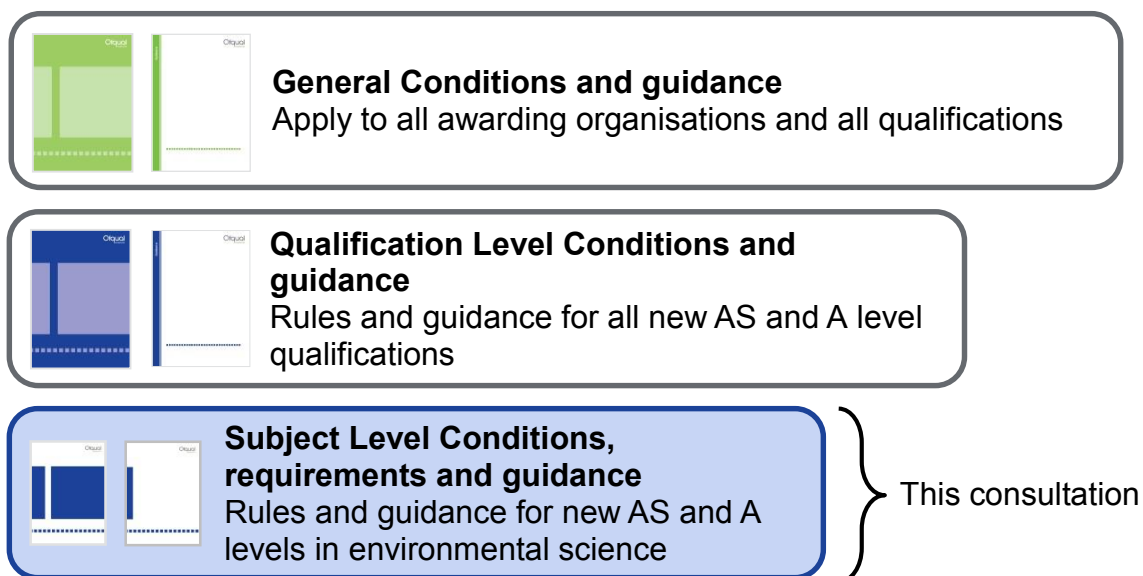
## Contents

1. Introduction .....	3
Scope of this consultation .....	3
How to respond to this consultation.....	5
2. Regulating AS and A level environmental science .....	6
Compliance with subject content and assessment objectives .....	6
Rules and guidance for exam assessment.....	7
Practical work .....	10
3. Our proposed Conditions and guidance .....	12
Proposed Conditions and requirements for AS and A level environmental science .	12
Proposed guidance for AS and A level environmental science .....	16
Questions on proposed Conditions, requirements and guidance .....	21
4. Equality impact analysis.....	22
Ofqual’s role, objectives and duties.....	22
Equality impact analysis relating to proposed changes to AS and A level environmental science.....	22
Appendix A: Regulatory tools .....	24
Comparability and innovation .....	24
Conditions of Recognition .....	24
Regulatory documents .....	25
Statutory guidance .....	25
Appendix B: Ofqual’s role, objectives and duties.....	26
Responding to the consultation .....	29
Your details .....	29
Questions .....	33
Accessibility of our consultations.....	38

## 1. Introduction

- 1.1 As most readers will know, changes are being made to GCSEs, AS and A levels taken by students in England. New AS and A level qualifications in environmental science will be taught in schools from September 2017.
- 1.2 The Department for Education (DfE) published the subject content<sup>1</sup> for AS and A level environmental science in December 2015.
- 1.3 Following our own consultation on assessment arrangements, we confirmed<sup>2</sup> in December 2015 that new AS and A levels in environmental science will be assessed solely through exams.
- 1.4 We also confirmed the assessment objectives for AS and A level environmental science.

### Scope of this consultation



- 1.5 This consultation builds on our – and the DfE’s – earlier decisions. It seeks views on the subject-specific rules and guidance we should put in place for AS and A level environmental science.
- 1.6 As explained in Appendix A, and illustrated in the figure above, these new rules and guidance will sit alongside our existing rules and guidance for

---

<sup>1</sup> [www.gov.uk/government/publications/gce-as-and-a-level-environmental-science](http://www.gov.uk/government/publications/gce-as-and-a-level-environmental-science)

<sup>2</sup> [www.gov.uk/government/consultations/development-of-new-gcses-and-a-levels-for-teaching-from-2017](http://www.gov.uk/government/consultations/development-of-new-gcses-and-a-levels-for-teaching-from-2017)

- all qualifications;<sup>3</sup> and
- all new AS and A level qualifications.<sup>4</sup>

1.7 This document sets out, and seeks views on:

- our proposed approach to regulating new AS and A levels in environmental science; and
- the subject-specific Conditions, requirements and guidance we propose to introduce to implement that approach.

---

<sup>3</sup> [www.gov.uk/guidance/awarding-organisations-understanding-our-regulatory-requirements#requirements-for-all-awarding-organisations-and-all-regulated-qualifications](http://www.gov.uk/guidance/awarding-organisations-understanding-our-regulatory-requirements#requirements-for-all-awarding-organisations-and-all-regulated-qualifications)

<sup>4</sup> [www.gov.uk/government/collections/new-a-level-and-as-level-qualifications-requirements-and-guidance](http://www.gov.uk/government/collections/new-a-level-and-as-level-qualifications-requirements-and-guidance)

## How to respond to this consultation

The closing date for responses is **20 January 2016**.

Please respond to this consultation in one of three ways:

- Complete the online response at <https://www.surveymoz.com/s3/2496367/AS-and-A-level-reform-regulations-for-environmental-science>;
- Complete the consultation questions at the end of this document and email your response to [consultations@ofqual.gov.uk](mailto:consultations@ofqual.gov.uk). Please include the consultation title (AS and A Level Environmental Science Consultation 2015) in the subject line of the email and make clear who you are and in what capacity you are responding; or
- Post your response to: AS and A Level Environmental Science Consultation 2015, Ofqual, Spring Place, Coventry Business Park, Herald Avenue, Coventry, CV5 6UB, making clear who you are and in what capacity you are responding.

## Evaluating the responses

To evaluate responses properly, we need to know who is responding to the consultation and in what capacity. We will therefore only consider your response if you complete the information page.

Any personal data (such as your name, address and any other identifying information) will be processed in accordance with the Data Protection Act 1998 and our standard terms and conditions.

We will publish our evaluation of responses. Please note that we may publish all or part of your response unless you tell us (in your answer to the confidentiality question) that you want us to treat your response as confidential. If you tell us you wish your response to be treated as confidential, we will not include your details in any published list of respondents, although we may quote from your response anonymously.

Please respond by **20 January 2016**.

## 2. Regulating AS and A level environmental science

### Compliance with subject content and assessment objectives

- 2.1 As we explained in paragraph 1.2, the DfE has published the subject content for new AS and A levels in environmental science.<sup>5</sup>
- 2.2 One of the ways we ensure new GCSEs, AS and A levels are comparable across exam boards is by requiring them to be in line with the relevant subject content and our assessment objectives.
- 2.3 The approach we have taken in every other new GCSE, AS and A level qualification is to introduce subject-specific Conditions which:
- require exam boards to comply with the requirements of the subject content (and have regard to any guidance within the subject content); and
  - require exam boards to comply with our assessment objectives (and have regard to our guidance on those assessment objectives).
- 2.4 In all other subjects this Condition includes a provision which requires exam boards to interpret the subject content in line with any rules we set and to have regard to any guidance we publish. Although we do not always specify how the subject content should be interpreted, we think it is important for us to be able to do so when there is a good reason for that (for example, if a different interpretation could compromise qualification standards or comparability).
- 2.5 We see no reason to take a different approach for AS and A level environmental science. We are therefore proposing that we should introduce a Condition which requires exam boards to:
- comply with the requirements (and have regard to any guidance) set out in the subject content;
  - comply with any requirements (and have regard to any guidance) we publish on interpreting the subject content; and
  - comply with our assessment objectives (and have regard to our guidance on those assessment objectives).

---

<sup>5</sup> [www.gov.uk/government/publications/gce-as-and-a-level-environmental-science](http://www.gov.uk/government/publications/gce-as-and-a-level-environmental-science)

**Question 1: To what extent do you agree or disagree that we should introduce a Condition which requires exam boards to comply with the relevant subject content and assessment objectives?**

### **Guidance on assessment objectives**

- 2.6 For all other new GCSE, AS and A level qualifications, we have published guidance which explains how exam boards should interpret our assessment objectives. This is designed to exam boards have a common understanding of – and take a consistent approach to targeting – the different assessment objectives.
- 2.7 We are proposing to introduce similar guidance for AS and A level environmental science.

**Question 2: To what extent do you agree or disagree that we should introduce guidance which clarifies how exam boards should interpret our assessment objectives?**

### **Rules and guidance for exam assessment**

- 2.8 In a number of other new GCSE, AS and A level subjects, we have specified rules which cover how specific areas of the subject content should be assessed. We normally do this where we think it is important exam boards take a consistent and comparable approach to assessing an area of content (in terms of the weighting assigned to that content area and/or the types of question used to target it).
- 2.9 For example, the subject content for the new science GCSEs, AS and A levels which have been developed for first teaching from September 2015 and September 2016 include:
- mathematical skills that students should be able to demonstrate; and
  - practical skills that should be indirectly assessed in exams.
- 2.10 In these subjects, either we or the DfE have set minimum proportions of exam marks which must be allocated to these content areas, and we have specified further rules around how they should be assessed.
- 2.11 The subject content for AS and A level environmental science includes specified mathematical skills, practical skills for indirect assessment in exams, and requirements for students to carry out practical work (albeit of a different nature to the practical work in AS and A level biology, chemistry and physics).

2.12 For environmental science, we believe we should take a similar approach to regulating exam assessments as we have in other science subjects. So we are proposing to introduce rules so that exam boards take a consistent approach to assessing mathematical skills and practical work in AS and A level environmental science.

**Question 3: To what extent do you agree or disagree that we should introduce rules for exam assessment to ensure exam boards take a consistent approach to assessing mathematical skills and practical work in AS and A level environmental science?**

### Assessing mathematical skills in exams

2.13 Appendix 2 to the subject content specifies the mathematical skills that students taking AS and A level environmental science should be able to use and apply.

2.14 We want to make sure that all exam boards take a consistent approach to assessing students' mathematical skills. As part of this, we have previously consulted<sup>6</sup> on a proposal that new AS and A levels in environmental science should allocate at least 10 per cent of marks to assessing mathematical skills.

2.15 We also want to make sure that mathematical skills are assessed in a way which is appropriate to the subject. In particular, we want to make sure that:

- mathematical skills are assessed at a comparable level of demand across exam boards;
- mathematical skills are assessed in the context of other areas of the subject content (and not in isolation); and
- students across the ability range have opportunities to access marks for mathematical skills (and these marks are not simply targeted at higher or lower ability candidates).

2.16 To do this, we are proposing to set rules which require exam boards to:

- assess mathematical skills in the context of other areas of the subject content, and not in isolation;

---

<sup>6</sup> [www.gov.uk/government/consultations/development-of-new-gcses-and-a-levels-for-teaching-from-2017](http://www.gov.uk/government/consultations/development-of-new-gcses-and-a-levels-for-teaching-from-2017)



- allocate at least 10 per cent of the marks for the qualification to rewarding use of mathematical skills at a level of demand which is at least equivalent to higher tier GCSE mathematics; and
- assess mathematical skills across a range of levels of demand which supports effective differentiation between candidates.

**Question 4: To what extent do you agree or disagree with our proposed approach to assessing mathematical skills in exams (including the 10 per cent minimum weighting) for AS and A level environmental science?**

### Assessing practical work in exams

2.17 Appendix 1 to the subject content identifies a range of practical skills which students taking AS and A level environmental science should develop during their course of study, and which should be assessed indirectly in exams.

2.18 When the DfE consulted on the subject content for AS and A level environmental science, it included a requirement that exams should allocate at least 15 per cent of marks to indirect assessment of practical work. Respondents to the DfE's consultation supported this requirement, which reflects the importance of practical work within environmental science, and is consistent with other AS and A level science subjects. Since this requirement relates to the assessment of AS and A level environmental science, we have agreed with the DfE that it should form part of our rules on assessment, rather than the subject content. It is therefore included within our draft assessment requirements set out below.

2.19 We also want to make sure exam boards take a consistent and comparable approach to assessing practical work in the exam. Our expectation is that exams will require students to:

- demonstrate and apply their knowledge and understanding of practical work;
- apply scientific thinking and practical skills and strategies in the context of written questions and problems;
- analyse and evaluate information in practical contexts; and
- include questions/tasks which draw on – and, where appropriate, combine – both theoretical and practical aspects of experimentation [and/or fieldwork].

2.20 We are therefore proposing to set rules which codify these expectations.

**Question 5: To what extent do you agree or disagree with our proposed approach to assessing practical work in exams (including the 15 per cent minimum weighting) for AS and A level environmental science?**

## Practical work

- 2.21 As well as setting out the practical skills which should be assessed indirectly through exams, the subject content<sup>7</sup> specifies that AS and A level specifications in environmental science must require students to undertake practical work (either fieldwork, laboratory work, or both).
- 2.22 These requirements reflect the importance of practical work within environmental science. Practical work is central to all good science qualifications, and to teaching and learning – and schools should be devoting sufficient teaching time to those activities.
- 2.23 The approach to identifying practical skills in the subject content for AS and A level environmental science is different from the approach in AS and A level biology, chemistry and physics. The subject content for environmental science does not identify specific practical skills which require direct assessment, or particular apparatus and techniques in which students need to develop proficiency. This reflects the different nature of practical work in environmental science – and in particular:
- the limited amount of laboratory-based practical work which is appropriate for AS and A level environmental science; and
  - the need for exam boards to offer a choice of field-based practical work to enable students from all schools, in different locations, to access such practical work.
- 2.24 Our proposed approach to assessing practical work in environmental science reflects the nature of that practical work.
- 2.25 As set out above, and in line with other AS and A level science subjects, we are proposing to require exam boards to design their exams in a way which rewards students who demonstrate what they have learned from practical work.
- 2.26 Unlike AS and A level biology, chemistry and physics, we are not requiring exam boards to include mandatory practical activities in their specifications. We are also not requiring a separately-reported grade for practical skills, because this

---

<sup>7</sup> [www.gov.uk/government/publications/gce-as-and-a-level-environmental-science](http://www.gov.uk/government/publications/gce-as-and-a-level-environmental-science)

would be inappropriate in a subject where there are no defined practical skills which require direct assessment.

2.27 Instead, we are proposing to adopt an approach which reflects how we have treated other subjects – such as AS and A level geography – which have similar requirements for either fieldwork or practical work. In those subjects, we have required exam boards to collect statements from schools which confirm that students have been given reasonable opportunities to complete the required practical activities. This is designed to reflect the importance of practical activities in those subjects, and to provide an extra safeguard that students are being given appropriate opportunities to carry out those activities.

**Question 6: To what extent do you agree or disagree with our proposed approach to practical work in AS and A level environmental science?**

### 3. Our proposed Conditions and guidance

3.1 As set out above, we are proposing to introduce subject-specific Conditions, requirements and guidance to implement the proposals in this consultation. We set out our proposed Conditions, requirements and guidance below.

#### Proposed Conditions and requirements for AS and A level environmental science

3.2 We are proposing to introduce the following Conditions and requirements which will apply to all new AS and A level qualifications in environmental science:

- a Condition covering compliance with subject content and assessment objectives;
- a further enabling Condition which allows us to specify more detailed requirements on assessment;
- a Condition covering the practical work statements exam boards should collect from schools;
- our assessment objectives; and
- requirements on assessment which relate to assessing mathematical skills and practical work.

<b>Condition</b>	<b>Compliance with content requirements</b>
<b>GCE(Environmental Science)1</b>	
GCE(Environmental Science)1.1	In respect of each GCE Qualification in Environmental Science which it makes available, or proposes to make available, an awarding organisation must – (a) comply with the requirements relating to that qualification set out in the document published by the Secretary of State entitled ‘Environmental science GCE AS and A level subject content’ <sup>8</sup> , document reference DFE-00198-2015, (b) have regard to any recommendations or guidelines relating to that qualification set out in that document, and

---

<sup>8</sup> [www.gov.uk/government/publications/gce-as-and-a-level-environmental-science](http://www.gov.uk/government/publications/gce-as-and-a-level-environmental-science)

<p>GCE(Environmental Science)1.2</p>	<p>(c) interpret that document in accordance with any requirements, and having regard to any guidance, which may be published by Ofqual and revised from time to time.</p>
<p>In respect of each GCE Qualification in Environmental Science which it makes available, or proposes to make available, an awarding organisation must comply with any requirements, and have regard to any guidance, relating to the objectives to be met by any assessment for that qualification which may be published by Ofqual and revised from time to time.</p>	<p>In respect of each GCE Qualification in Environmental Science which it makes available, or proposes to make available, an awarding organisation must comply with any requirements, and have regard to any guidance, relating to the objectives to be met by any assessment for that qualification which may be published by Ofqual and revised from time to time.</p>
<p><b>Condition</b> <b>GCE(Environmental Science)2</b></p>	<p><b>Assessment</b></p>
<p>GCE(Environmental Science)2.1</p>	<p>An awarding organisation must ensure that in respect of each assessment for a GCE Qualification in Environmental Science which it makes available it complies with any requirements, and has regard to any guidance, which may be published by Ofqual and revised from time to time.</p>
<p><b>Condition</b> <b>GCE(Environmental Science)3</b></p>	<p><b>Practical work statements</b></p>
<p>GCE(Environmental Science)3.1</p>	<p>In respect of each assessment cycle for a GCE Qualification in Environmental Science which it makes available, an awarding organisation must –</p> <p>(a) require each Centre to provide a practical work statement to the awarding organisation, and</p> <p>(b) treat any failure by a Centre to provide a practical work statement to the awarding organisation in a timely manner as malpractice and/or maladministration (under General Condition A8 (<i>Malpractice and maladministration</i>)).</p>
<p>GCE(Environmental Science)3.2</p>	<p>For the purposes of this condition, a ‘practical work statement’ is a true and accurate written statement made by a Centre to an awarding organisation which confirms that it has taken reasonable steps to secure that each Learner to which that Centre has delivered the</p>

assessments to be taken in a particular assessment cycle for a GCE Qualification in Environmental Science which the awarding organisation makes available has met the requirements for practical work set out in Appendix 1 to the document published by the Secretary of State entitled ‘Environmental Science GCE AS and A level subject content’, document reference DFE-00198-2015.<sup>9</sup>

### **Assessment objectives – GCE Qualifications in Environmental Science**

Condition GCE (Environmental Science)1.2 allows us to specify requirements relating to the objectives to be met by any assessment for GCE Qualifications in Environmental Science.

The assessment objectives set out below constitute requirements for the purposes of Condition GCE(Environmental Science)1.2. Awarding organisations must comply with these requirements in relation to all GCE Qualifications in Environmental Science they make available.

	<b>Objective</b>	<b>Weighting (A level)</b>	<b>Weighting (AS)</b>
<b>AO1</b>	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%
<b>AO2</b>	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%
<b>AO3</b>	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%

<sup>9</sup> [www.gov.uk/government/publications/gce-as-and-a-level-environmental-science](http://www.gov.uk/government/publications/gce-as-and-a-level-environmental-science)

## **Assessment requirements – GCE Qualifications in Environmental Science**

Condition GCE(Environmental Science)2.1 allows us to specify requirements in relation to assessments for GCE Qualifications in Environmental Science.

We set out below our requirements for the purposes of Condition GCE(Environmental Science)2.1. Awarding organisations must comply with these requirements in relation to all GCE Qualifications in Environmental Science they make available.

### **Mathematical skills**

The subject content for GCE Qualifications in Environmental Science is set out in the document published by the Secretary of State entitled 'Environmental science GCE AS and A level subject content', document reference DFE-00198-2015 (the 'Content Document').

Appendix 2 to the Content Document specifies the mathematical knowledge, skills and understanding which Learners will be required to demonstrate and apply in GCE Qualifications in Environmental Science (the 'Mathematical Skills').

In designing and setting the assessments for a GCE Qualification in Environmental Science which it makes available, or proposes to make available, an awarding organisation must ensure that –

- (a) questions and tasks rewarding the use of Mathematical Skills assess those skills within the context of other areas of the subject content, and not in isolation,
- (b) in each set of assessments,<sup>10</sup> at least 10 per cent of the total marks for the qualification reward the use of Mathematical Skills at a Level of Demand which is not lower than that which is expected of Learners in assessments for the higher tier in a GCSE Qualification in Mathematics, and
- (c) without prejudice to the above requirements and those outlined in the Content Document, in each set of assessments Mathematical Skills are assessed across a range of Levels of Demand which supports effective differentiation in relation to the qualification.

---

<sup>10</sup> 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.

### **Practical skills**

Appendix 1 to the Content Document specifies skills, knowledge and understanding in relation to practical work which Learners are expected to be able to demonstrate in assessments.

In designing and setting the assessments for each GCE Qualification in Environmental Science which it makes available, or proposes to make available, an awarding organisation must ensure that, taking the assessments for that qualification together –

- (a) Learners' knowledge, skills and understanding in relation to practical work is assessed across assessment objectives AO1 to AO3,
- (b) the number of marks used to credit such knowledge, skills and understanding is no less than 15 per cent of the total marks for the qualification,
- (c) the questions and tasks which test Learners' knowledge, skills and understanding in relation to practical work draw on, and combine as appropriate, the theoretical and practical aspects of experimentation and/or fieldwork, and
- (d) Learners are required to –
  - (i) show and apply knowledge and understanding of practical activities, and
  - (ii) apply scientific thinking, use experimental skills and strategies, and analyse and evaluate information.

### **Proposed guidance for AS and A level environmental science**

- 3.3 We are proposing to introduce guidance on assessment objectives which will apply to all new AS and A level 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 which 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.

AO1: Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues		30-35% (A level) 35-40% (AS)	
Strands	Elements	Coverage	Interpretation and definitions
n/a	1a – Demonstrate knowledge of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues	<ul style="list-style-type: none"> <li>■ Full coverage in each set of assessments<sup>11</sup> (but not in every assessment)</li> <li>■ A reasonable balance between elements in each set of assessments (but not in every assessment)</li> <li>■ Awarding organisations should justify the balance between elements 1a and 1b in their assessment strategies</li> <li>■ No more than 10% of the total marks for the qualification should reward demonstrating knowledge in isolation<sup>12</sup></li> </ul>	<ul style="list-style-type: none"> <li>■ Both here and in AO2 –                             <ul style="list-style-type: none"> <li>□ <b>scientific ideas, processes, techniques and procedures</b> are aspects of subject content. Awarding organisations should explain their approach to targeting them in their assessment strategies</li> <li>□ <b>natural systems</b> 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</li> <li>□ <b>natural processes</b> means the biogeochemical events, pathways and reactions that transform material within natural systems</li> </ul> </li> <li>■ 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.</li> </ul>
	1b – Demonstrate understanding of scientific ideas, processes, techniques and procedures, including in relation to natural processes/systems and environmental issues		

<sup>11</sup> 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.

<sup>12</sup> 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	Interpretation and definitions
n/a	This assessment objective 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>■ See guidance in relation to AO1 for definitions of <b>scientific ideas, processes, techniques and procedures, natural systems and natural processes</b>.</li> <li>■ 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 –                             <ul style="list-style-type: none"> <li>□ exploring contexts and situations that are not explicitly indicated in the specification;</li> <li>□ making links between types of material which are not explicitly indicated in the specification</li> </ul> </li> <li>■ 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).</li> <li>■ Questions/tasks should require evidence-based responses to assess active processing of knowledge and understanding.</li> </ul>

AO3: Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to environmental issues, to make judgements and draw conclusions		25-30% (A level) 20-25% (AS)	
Strands	Elements	Coverage	Interpretation and definitions
n/a	1a – analyse scientific information, ideas and evidence, including in relation to environmental issues	<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 elements in each set of assessments (but not in every assessment)</li> <li>■ Awarding organisations should justify the balance between elements 1a and 1b in their assessment strategies</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Scientific information and evidence</b> includes:                             <ul style="list-style-type: none"> <li>□ 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,</li> <li>□ Evidence processed e.g. evidence/information used in planning to test ideas/hypotheses, explaining, interpreting, modelling, and</li> <li>□ Evidence validated e.g. justifying conclusions/making value judgements based on evidence/information.</li> </ul> </li> <li>■ 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</li> <li>■ The abilities to interpret and evaluate in this context are both linked and complementary.</li> <li>■ Questions/tasks should address a range of materials. However, an individual item could address a single type of information source.</li> <li>■ Where Learners' conclusions relate to practical work, they should either involve refining practical design and procedures or developing/planning practical procedures to solve problems.</li> </ul>
	1b – interpret and evaluate scientific information, ideas and evidence, including in relation to environmental issues		
	1c – make judgements and draw conclusions		

## **Questions on proposed Conditions, requirements and guidance**

**Question 7: Do you have any comments on our proposed Conditions and requirements for AS and A level environmental science?**

**Question 8: Do you have any comments on our proposed guidance for AS and A level environmental science?**

## 4. Equality impact analysis

### Ofqual's role, objectives and duties

- 4.1 We are subject to the public sector equality duty. We have set out in Appendix B how this duty interacts with our statutory objectives and other duties.

### Equality impact analysis relating to proposed changes to AS and A level environmental science

- 4.2 We have considered the potential impact on students who share protected characteristics<sup>13</sup> of the application of the principles and features that will apply to all new AS and A level qualifications. Our equality impact analysis for our earlier consultation on AS and A level reform<sup>14</sup> is therefore of interest and we encourage you to read it.
- 4.3 Issues concerning the proposed subject content have been considered by the DfE, which has published its own Equalities Impact Analysis on its subject content proposals.<sup>15</sup>
- 4.4 We have also previously considered the potential impact on students who share protected characteristics of our decisions on assessment arrangements for this subject.<sup>16</sup>
- 4.5 We do not repeat here all of the evidence we have considered, as this can be found in our earlier reports. We focus instead on the specific issues that arise from the new proposals in this consultation, and from the way in which we are implementing our previous policy decisions.
- 4.6 We have not identified any additional negative impacts on students who share protected characteristics which would result from the proposals in this consultation (beyond those that we and DfE have already identified in our earlier reports).

---

<sup>13</sup> For the purposes of the public sector equality duty, the protected characteristics are disability, racial group, age, religion or belief, pregnancy or maternity, sex, sexual orientation, gender reassignment.

<sup>14</sup> <http://webarchive.nationalarchives.gov.uk/20141031163546/http://www.ofqual.gov.uk/files/2012-06-18-equality-analysis-of-the-a-level-reform-consultation.pdf>

<sup>15</sup> [www.gov.uk/government/consultations/gcse-and-a-level-reform-content-for-teaching-from-september-2017](http://www.gov.uk/government/consultations/gcse-and-a-level-reform-content-for-teaching-from-september-2017)

<sup>16</sup> [www.gov.uk/government/consultations/development-of-new-gcses-and-a-levels-for-teaching-from-2017](http://www.gov.uk/government/consultations/development-of-new-gcses-and-a-levels-for-teaching-from-2017)

- 4.7 During this consultation, we will continue to seek and consider evidence and feedback to our proposals that might help us identify any potential subject-specific impacts on students who share a protected characteristic.
- 4.8 Exam boards are required to consider the accessibility of their qualifications at the design stage and to remove any unjustifiable barriers.

**Question 9: We have not identified any ways (beyond those we have identified in earlier consultations) in which the proposals for AS and A level environmental science would impact (positively or negatively) on persons who share a protected characteristic.<sup>17</sup> Are there any potential impacts we have not identified?**

**Question 10: Are there any additional steps we could take to mitigate any negative impact resulting from these proposals on persons who share a protected characteristic?**

**Question 11: Do you have any other comments on the impacts of the proposals on students who share a protected characteristic?**

---

<sup>17</sup> 'Protected characteristic' is defined in the Equality Act 2010. Here, it means disability, racial group, age, religion or belief, pregnancy or maternity, sex, sexual orientation and gender reassignment.

## Appendix A: Regulatory tools

### Comparability and innovation

Exam boards operate in a market. They can design and deliver their qualifications in different ways, within the parameters we set. This provides some choice to schools or colleges, which is one of the benefits of a qualifications market. Exam boards must, however, make sure that the levels of attainment indicated by their qualifications are comparable to those of other exam boards' versions of the qualifications. The exam boards cooperate in a range of ways to make sure that the standards of their respective qualifications are comparable. To make sure standards are maintained and comparability is secured, we review AS and A level qualifications before they can be made available, by applying an accreditation requirement to the qualifications, and we oversee the awarding of AS and A level qualifications.

We do not wish to close down opportunities for exam boards to design and deliver their qualifications in different ways. Indeed, we have a statutory duty to have regard to the desirability of facilitating innovation in connection with the provision of regulated qualifications and a statutory objective with regard to the efficiency with which the qualifications market works. If we adopt a regulatory approach in which all aspects of a qualification are very tightly defined, we could effectively remove scope for exam boards to distinguish their qualifications from others and stop choice for schools or colleges. On the other hand, if exam boards have too much scope to vary their approach their qualifications might not be comparable.

In striking a balance, we use a range of tools to regulate qualifications and the exam boards that provide them. The main regulatory tools we use for the qualifications in this consultation are explained below.

### Conditions of Recognition

Exam boards must comply at all times with our Conditions of Recognition. These are the main regulatory rules that we use. We can take regulatory action against an exam board that breaches or is likely to breach a Condition.

There are three sets of Conditions that will apply to new AS and A level qualifications:

- (i) the published *General Conditions of Recognition*<sup>18</sup> that apply to all regulated qualifications;

---

<sup>18</sup> [www.gov.uk/government/publications/general-conditions-of-recognition](http://www.gov.uk/government/publications/general-conditions-of-recognition)



- (ii) *GCE Qualification Level Conditions and Requirements*<sup>19</sup> that apply to all new AS and A level qualifications; and
- (iii) GCE Subject Level Conditions that apply to new AS and A level qualifications in a specific subject. We are consulting now on draft GCE Subject Level Conditions for environmental science.

## **Regulatory documents**

In some Conditions we refer to published regulatory requirements. We publish these in regulatory documents. The Conditions require exam boards to comply with such documents.

We are consulting on a regulatory document which covers our requirements in relation to assessment of mathematical skills and practical work.

The requirements will have effect as if they were part of a Condition. The requirements will be set out in a stand-alone section of the Conditions document, simply because they are technical and detailed so they sit better as separate from, rather than within, the Condition itself.

## **Statutory guidance**

We publish guidance to help exam boards identify the types of behaviour or practices they could use to meet a Condition. Exam boards must have regard to such guidance, but they do not have to follow this guidance in the same way that they must comply with the Conditions; they are free to meet the outcomes of the Conditions in their own ways. An exam board that decides to take a different approach to that set out in our guidance must still be able to show that it is meeting the Condition or Conditions to which the guidance relates.

We are consulting now on draft guidance for new AS and A levels in environmental science.

---

<sup>19</sup> [www.gov.uk/government/publications/gce-qualification-level-conditions-and-requirements](http://www.gov.uk/government/publications/gce-qualification-level-conditions-and-requirements)

## Appendix B: Ofqual's role, objectives and duties

Our statutory objectives include the qualifications standards objective, which is to secure that the qualifications we regulate:

- (a) give a reliable indication of knowledge, skills and understanding; and
- (b) indicate:
  - (i) a consistent level of attainment (including over time) between comparable regulated qualifications; and
  - (ii) a consistent level of attainment (but not over time) between qualifications we regulate and comparable qualifications (including those awarded outside the UK) that we do not regulate.

We must therefore regulate so that qualifications properly differentiate between students who have demonstrated that they have the knowledge, skills and understanding required to attain the qualification and those who have not.

We also have a duty under the Apprenticeship, Skills, Children and Learning Act 2009 to have regard to the reasonable requirements of relevant students, including those with special educational needs and disabilities, of employers and of the higher education sector, and to aspects of government policy when so directed by the Secretary of State.

As a public body, we are subject to the public sector equality duty.<sup>20</sup> This duty requires us to have due regard to the need to:

- (a) eliminate discrimination, harassment, victimisation and any other conduct that is prohibited under the Equality Act 2010;
- (b) advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it;
- (c) foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

The exam boards that design, deliver and award AS and A level qualifications are required by the Equality Act, among other things, to make reasonable adjustments for disabled people taking their qualifications, except where we have specified that such adjustments should not be made.

---

<sup>20</sup> Equality Act 2010, section 149.

When we decide whether such adjustments should not be made, we must have regard to:

- (a) the need to minimise the extent to which disabled persons are disadvantaged in attaining the qualification because of their disabilities;
- (b) the need to secure that the qualification gives a reliable indication of the knowledge, skills and understanding of a person upon whom it is conferred;
- (c) the need to maintain public confidence in the qualification.

Legislation therefore sets out a framework within which we must operate. We are subject to a number of duties and we must aim to achieve a number of objectives. These different duties and objectives can, from time to time, conflict with each other. For example, if we regulate to secure that a qualification gives a reliable indication of a student's knowledge, skills and understanding, a student who has not been able to demonstrate the required knowledge, skills and/or understanding will not be awarded the qualification. A person may find it more difficult, or impossible, to demonstrate the required knowledge, skills and/or understanding because they have a protected characteristic. This could put them at a disadvantage relative to others who have been awarded the qualification. It is not always possible for us to regulate so that we can both secure that qualifications give a reliable indication of knowledge, skills and understanding and advance equality between people who share a protected characteristic and those who do not. We must review all the available evidence and actively consider all the available options before coming to a final, rational decision.

Qualifications cannot be used to mitigate inequalities or unfairness in the education system or in society more widely than might affect, for example, students' preparedness to take the qualification and the assessments within it. While a wide range of factors can have an impact on a student's ability to achieve a particular mark in an assessment, our influence is limited to the way the qualification is designed and assessed.

We require the exam boards to design qualifications to give a reliable indication of the knowledge, skills and understanding of those on whom they are conferred. We also require the exam boards to avoid, where possible, features of a qualification that could, without justification, make a qualification more difficult for a student to achieve because they have a particular protected characteristic. We require exam boards to monitor whether any features of their qualifications have this effect.

In setting the overall framework within which exam boards will design, assess and award the reformed GCSE, A level and AS qualifications, we want to understand the possible impacts of the proposals on persons who share a protected characteristic.

The protected characteristics under the Equality Act 2010 are:

- age;
- disability;
- gender reassignment;
- marriage and civil partnerships;
- pregnancy and maternity;
- race;
- religion or belief;
- sex;
- sexual orientation.

It should be noted that with respect to the public sector equality duty under section 149 of the 2010 Act, we are not required to have due regard to impacts on those who are married or in a civil partnership.

## **Responding to the consultation**

### **Your details**

To evaluate responses properly, we need to know who is responding to the consultation and in what capacity. We will therefore only consider your response if you complete the following information section.

We will publish our evaluation of responses. Please note that we may publish all or part of your response unless you tell us (in your answer to the confidentiality question) that you want us to treat your response as confidential. If you tell us you wish your response to be treated as confidential, we will not include your details in any published list of respondents, although we may quote from your response anonymously.

Please answer all questions marked with a star\*

Name\*

Position\*

Organisation name (if applicable)\*

Address

Email

Telephone

**Would you like us to treat your response as confidential?\***

If you answer yes, we will not include your details in any list of people or organisations that responded to the consultation.

Yes  No

**Is this a personal response or an official response on behalf of your organisation?\***

Personal response (please answer the question ‘If you ticked “Personal response”...’)

Official response (please answer the question ‘If you ticked “Official response”...’)

**If you ticked “Personal response”, which of the following are you?**

Student

Parent or carer

Teacher (but responding in a personal capacity)

Other, including general public (please state below)

---

**If you ticked “Official response”, please respond accordingly:**

**Type of responding organisation\***

Awarding organisation

Local authority

School or college (please answer the question below)

Academy chain

Private training provider

University or other higher education institution

Employer

Other representative or interest group (please answer the question below)

**School or college type**

- Comprehensive or non-selective academy
  - State selective or selective academy
  - Independent
  - Special school
  - Further education college
  - Sixth form college
  - Other (please state below)
- 

**Type of representative group or interest group**

- Group of awarding organisations
  - Union
  - Employer or business representative group
  - Subject association or learned society
  - Equality organisation or group
  - School, college or teacher representative group
  - Other (please state below)
- 

**Nation\***

- England
- Wales
- Northern Ireland
- Scotland
- Other EU country: \_\_\_\_\_
- Non-EU country: \_\_\_\_\_

**How did you find out about this consultation?**

Our newsletter or another one of our communications

Our website

Internet search

Other

---

**May we contact you for further information?**

Yes  No



## Questions

**Question 1: To what extent do you agree or disagree that we should introduce a Condition which requires exam boards to comply with the relevant subject content and assessment objectives?**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

.....

.....

.....

**Question 2: To what extent do you agree or disagree that we should introduce guidance which clarifies how exam boards should interpret our assessment objectives?**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

.....

.....

.....

**Question 3: To what extent do you agree or disagree that we should introduce rules for exam assessment ensure exam boards take a consistent approach to assessing mathematical skills and practical work in AS and A level environmental science?**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

.....

.....

.....

**Question 4: To what extent do you agree or disagree with our proposed approach to assessing mathematical skills in exams (including the 10 per cent minimum weighting) for AS and A level environmental science?**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

.....

.....

.....

**Question 5: To what extent do you agree or disagree with our proposed approach to assessing practical work in exams (including the 15 per cent minimum weighting) for AS and A level environmental science?**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

.....

.....

.....

**Question 6: To what extent do you agree or disagree with our proposed approach to practical work in AS and A level environmental science?**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

.....

.....

.....

**Question 7: Do you have any comments on our proposed Conditions and requirements for AS and A level environmental science?**

Yes  No

.....  
.....  
.....

**Question 8: Do you have any comments on our proposed guidance for AS and A level environmental science?**

Yes  No

.....  
.....  
.....

**Question 9: We have not identified any ways (beyond those we have identified in earlier consultations) in which the proposals for AS and A level environmental science would impact (positively or negatively) on persons who share a protected characteristic.<sup>21</sup> Are there any potential impacts we have not identified?**

Yes  No

.....  
.....  
.....

---

<sup>21</sup> 'Protected characteristic' is defined in the Equality Act 2010. Here, it means disability, racial group, age, religion or belief, pregnancy or maternity, sex, sexual orientation and gender reassignment.

**Question 10: Are there any additional steps we could take to mitigate any negative impact resulting from these proposals on persons who share a protected characteristic?**

Yes  No

.....  
.....  
.....

**Question 11: Do you have any other comments on the impacts of the proposals on students who share a protected characteristic?**

Yes  No

.....  
.....  
.....

## Accessibility of our consultations

We are looking at how we provide accessible versions of our consultations and would appreciate it if you could spare a few moments to answer the following questions. Your answers to these questions will not be considered as part of the consultation and will not be released to any third parties.

**We want to write clearly, directly and put the reader first. Overall, do you think we have got this right in this consultation?**

Yes  No

**Do you have any comments or suggestions about the style of writing?**

Yes  No

.....  
.....  
.....

**Do you have any special requirements to enable you to read our consultations? (for example, screen reader, large text, and so on)**

Yes  No

**Which of the following do you currently use to access our consultation documents? (select all that apply)**

Screen reader / text-to-speech software

Braille reader

Screen magnifier

Speech-to-text software

Motor assistance (blow-suck tube, mouth stick, and so on)

Other .....

**Which of the following document formats would meet your needs for accessing our consultations? (select all that apply)**

- A standard PDF
- Accessible web pages
- Large-type PDF (16 point text)
- Large-type Word document (16 point text)
- eBook (Kindle, iBooks, or similar format)
- Braille document
- Spoken document
- Other .....

**How many of our consultations have you read in the last 12 months?**

- 1
- 2
- 3
- 4
- 5
- More than 5

We wish to make our publications widely accessible. Please contact us at [publications@ofqual.gov.uk](mailto:publications@ofqual.gov.uk) if you have any specific accessibility requirements.



© Crown copyright 2015

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit <http://nationalarchives.gov.uk/doc/open-government-licence/version/3> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: [publications@ofqual.gov.uk](mailto:publications@ofqual.gov.uk).

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available at [www.gov.uk/ofqual](http://www.gov.uk/ofqual).

Any enquiries regarding this publication should be sent to us at:

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