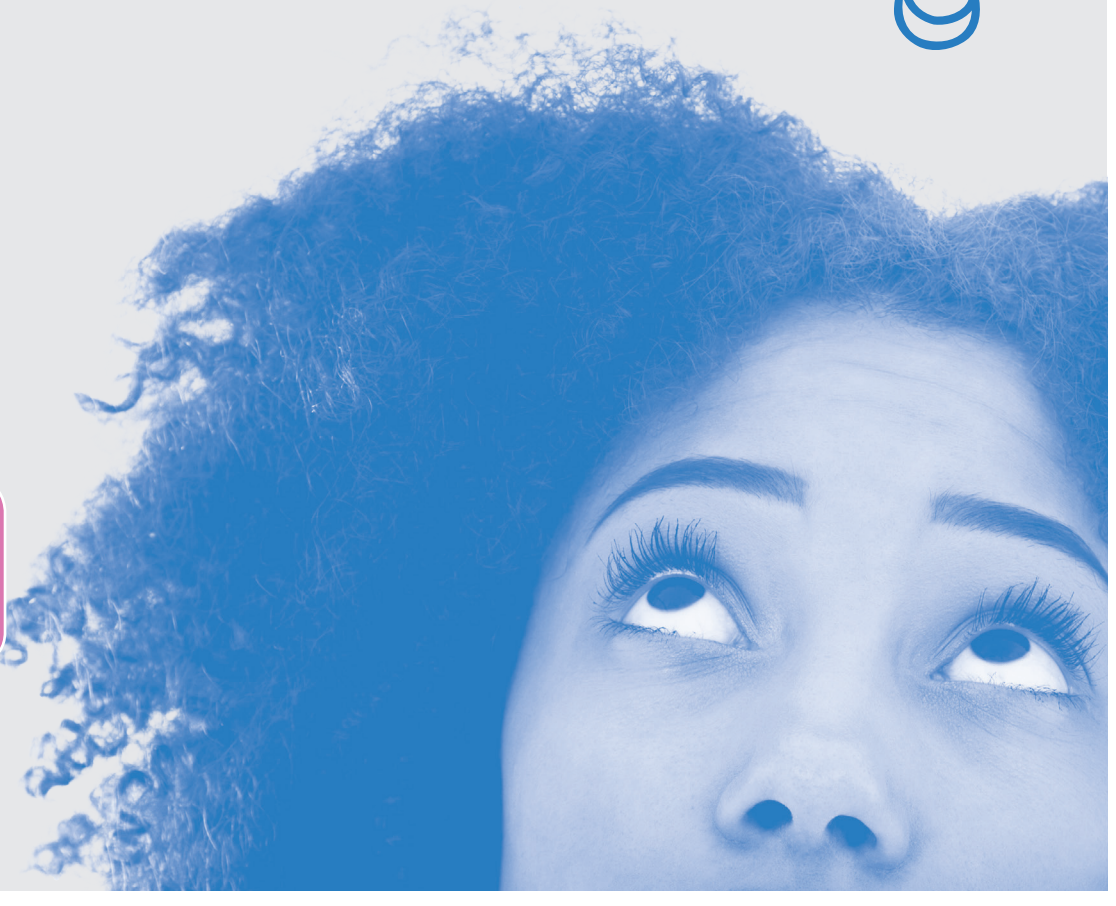
AQA
Realising potential

Focus on success: GCSE science

Extended response questions

Build on your students' assessment performance using our self-guided, modular training pack



Pre-reading booklet

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Using this pack

Containing materials from our spring 2019 Hub schools network meetings, this pack is designed to enable you to deliver a CPD session on extended response questions for your teaching colleagues.

Using the completed pre-session health checks and provided route map, you'll be able to design a bespoke session to focus learning on the areas your colleagues are less confident teaching.

This resource pack is intended to help you:

- deliver a CPD session for teaching colleagues on extended response questions, giving them the opportunity to interpret levels of response mark schemes using student responses from the summer 2018 papers
- understand how to apply the levels of response mark schemes
- understand how the level descriptors discriminate quality of response
- understand what is required for each command word.

Before the session

- Print out and ask your colleagues to each complete the pre-session health check (page 13 in this booklet).
- Use the responses to the health check to tailor the training session to the needs of your colleagues. The route map on page 6 will help you plan which activities to use in the session.
- Each colleague should have a copy of the activities and handouts booklets.
- The post-session health check should be printed for each delegate.

Running the session

- Download the guidance presentation from aqa.org.uk/focus-on-success-science
- Establish why focusing on extended response questions is beneficial to students, how extended responses are assessed and how they are marked using a levels of response (LoR) mark scheme.
- Remind teachers that extended response questions will be asked at all levels of demand, that perfection is not needed for full marks and that responses do not need to be written in continuous prose.
- The PowerPoint presentation will provide guidance and discussion questions to move you through your bespoke session.

After the session

- Ask your colleagues to each complete the post-session health check (page 14 in this booklet) to ensure the training has been successful.
- As a group, discuss how you can support each other to embed the learnings in your teaching. Use the prompt questions on slide 25 of the PowerPoint presentation to guide your discussion.
- Complete the individual and group action plan templates (pages 9–11 in the handouts booklet).
- A certificate of attendance can be created and printed for each delegate from aqa.org.uk/focus-on-success-science.

Summary of activities

Activity 1 – Command words card sort

- Slide 3 on the guidance presentation.
- A group activity to match the command words to the description. Get the group to discuss and agree on the right definition and using the card sort on slides 3–7 of the guidance presentation, drag the description across the screen to sit next to the command word.
- Follow up with a group discussion, using the prompt questions on slide 8 of the guidance presentation.

Activity 2 – Command words students find challenging

- Slide 9 on the guidance presentation.
- In pairs or small groups, delegates should discuss what students find challenging when interpreting command words.
- Using the example questions, mark schemes and commentaries on pages 5–26 of the activities booklet:
  - focus on what the command word is actually asking the students to do
  - what are the common mistakes students make when interpreting the command word
  - using the mark scheme, see what is expected for each command word.
- Follow up with a group discussion, using the prompt questions on slide 10 of the presentation.

Activity 3 – Understanding how to apply a levels of response mark scheme

- Slide 11 on the guidance presentation.
- Using the template on page 27 of the activities booklet, delegates are to individually map the stages of applying a levels of response mark scheme.
- This should be compared to the examiner process on page 8 of the handouts booklet.
- Using pages 6–8 in the handouts booklet, discuss how each level is different for each level descriptor and what students need to do to access the next level.

Activity 4 – Bringing command words and levels of response together

- Slide 12 on the guidance presentation.
- In pairs or small groups, and using the provided mark schemes, delegates are to identify the parts of the student responses (pages 28–33 of the activities booklet) which justify full marks.
- In the handouts booklet, there is also an annotated levels of response mark scheme and levels descriptors on pages 5 and 6–7 respectively.
- Using the examples and prompt questions on slides 13–22 of the guidance presentation, discuss the responses to the activity.

Activity 5 – Process of applying a levels of response mark scheme

- Slide 23 on the guidance presentation.
- Applying the process, delegates should individually mark a selection of the student responses on pages 34–53 of the activities booklet.
- Using the prompt questions on slide 24 of the presentation, discuss the marks awarded by the delegates and generate ideas as to how it can be turned into a classroom activity. For comparison, the examiner commentaries can found on pages 54–55 of the activities booklet.

Extended response questions route map

Area for development

Does the team need to understand what the different command words mean?	Does the team need to see some command words are used in live questions?	Does the team need to understand how to apply a levels of response mark scheme?	Does the team need to understand the difference between each level on a levels of response mark scheme for each command word?	Does the team need to practice applying the standard correctly using a levels of response mark scheme and student examples?
Activity 1: Card sort Page 4 of Activities booklet, Slides 3-7 of Guidance presentation	**Activity 2:** Command words students find challenging Page 5 of Activities booklet, Slide 9 of Guidance presentation	**Handout:** Review annotated mark scheme and levels descriptors Pages 5-7 of Handouts booklet	**Activity 4:** Bringing command words and levels of response mark schemes together Pages 28-33 of Activities booklet, Slide 12 of Guidance presentation	**Activity 5:** Applying the process chart (page 8 of the Handouts booklet), mark student example responses Pages 34-53 of Activities booklet, Slide 23 of Guidance presentation
Group discussion: Discuss responses to activity Slide 8 of Guidance presentation	**Group discussion:** Discuss responses to activity Slide 10 of Guidance presentation	**Activity 3:** Create a process chart showing the steps taken when marking a LOR question Page 27 of Activities booklet, Slide 11 of Guidance presentation	**Group discussion:** Discuss responses to activity Slides 13-22 of Guidance presentation	**Group discussion:** Discuss the marks awarded and how this can be turned into a student activity Slide 24 of Guidance presentation
Handout: Command words Page 4 of Handouts booklet		**Handout:** Compare your process chart against the AQA process chart Page 8 of Handouts booklet		

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Introduction to extended response questions

Extended response questions were introduced into the GCSE science assessments to replace the legacy quality of written communication (QWC) questions.

To answer this style of question students need to be able to develop a clear, coherent line of reasoning to produce a logically structured answer. The ability to write in a logical way demonstrates real understanding of content rather than basic recall of facts. Practising this skill will improve a student's overall understanding and help them to link ideas and make connections between concepts.

Answers do not need to be written in continuous prose. Other acceptable ways of writing a response include:

- bullet points or numbered statements – these should be structured in a logical way that demonstrates the clear line of reasoning. The points should be statements and not just a list of words. Students often find this an easier way to structure their answer and think through things – especially methods
- tabulating the answer – the headings should be clear and relevant and the material laid out clearly. This can be particularly helpful when answering 'compare' or 'evaluate' questions but statements, explanations and numerical data need to be clearly linked across the table so like is being compared with like
- diagrams, for example of an experimental set up – these should be clearly annotated and referenced in the response. A logically sequenced series of annotated diagrams can save time writing and may be clearer than a long written account.

Encourage students to be concise and not over-write. The number of answer lines is an indication of the maximum amount of space a student should be using, not the space they must fill. Sometimes a student keeps writing to fill the space and ends up contradicting themselves or including wrong statements that affect the overall quality of the answer.

What we mean by extended response questions

An extended response is:
‘Evidence generated by a Learner which is of sufficient length to allow that Learner to demonstrate the ability to construct and develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.’
(Ofqual *GCSE (9 to 1) Qualification Level Conditions and Requirements* September 2017, Condition GCSE 5.4).

There are many questions that require students to mention a clear/fixed number of points (often in a particular order) to get the marks. In contrast, extended response questions do not have one fixed approach to gaining the marks; there is a variety of acceptable ways of responding.

About 10% of the marks for the Foundation tier and about 15% of marks for the Higher tier are classed as extended response questions. Questions will be addressed across the whole range of abilities from grade 1 to grade 9.

Extended response questions are worth 4–6 marks, depending on the content of the question and can cover AO1, AO2 or AO3, or a combination of the Assessment Objectives. They may require students to link together their understanding and skills from more than one area of the specification to produce a top-level answer.

A multi-step calculation can also be classified as an extended response (when two or more steps need to be completed in the correct order). These are generally points marked.

Typically, extended response questions have one of the following commands:
- calculate/determine
- compare
- describe
- design/plan/describe a method
- evaluate
- explain.

Benefits of using extended response questions

Developing transferrable skills

- Using the mark scheme descriptors for each command word will allow students to acquire transferrable skills that they can apply to all extended response question types.
- Supporting students to understand what is required by the command words enables them to focus their answers and address the task more confidently.

Developing deep understanding

The ability to write in a logical way allows students to demonstrate real understanding of content rather than basic recall of facts. Practising this skill will enhance a student's overall understanding of the science.

Linking ideas and making connections

- Extended response questions may require students to link together concepts from different sections of the specification to produce a clear and logically structured answer. Giving students the opportunity to think through ideas and make those connections supports deeper understanding of the subject as a whole, an appreciation of the breadth of science and the links between concepts. As topics may be taught in isolation, students often miss out on this sort of understanding.
- Study at A-level requires students to be able to think in a synoptic way, and introducing the opportunity to develop this skill earlier in a student's experience will ease progression to further study.

Levels of response mark schemes

Extended response questions are marked using a levels of response (LoR) mark scheme (except for multi-step calculations which are points marked). A LoR mark scheme is chosen because it is a better discriminator in student performance for very open questions.

A LoR mark scheme:
- rewards the overall quality of the answer
- divides performance into chunks of marks (levels) on a continuum
- describes the performance at each level.

This is a holistic approach to marking which takes into account the many ways a student can correctly answer a given question. As with all our mark schemes, the LoR scheme is designed to ensure students are credited with the maximum marks possible for their answers.

Looking at the overall quality of the answer, rather than focusing on punctuation and spelling, is fairer than the previous quality of written communication (QWC) approach.

The elements of a GCSE science LoR mark scheme

The LoR mark scheme has two main parts:
- the levels descriptors
- a list of indicative content

The mark is awarded by applying a best-fit, holistic approach to the whole response to ascertain first the level and then the final mark within the level.

Levels descriptors

In GCSE science, we have developed generic levels descriptors linked to the command word. The same descriptors are used across all the sciences to ensure consistency of approach. This consistency helps with both constructing and marking these types of questions.

The levels descriptors are not dependent on level of demand: Level 3 is not just for grade 9. Questions are targeted at different levels of demand so students of all abilities should be able to access top level marks. For example, in a low-demand question, students working at grade 3 should be able to access full marks, as should a grade 4 student answering a standard-demand question.

Indicative content

The indicative content is a list of relevant points that examiners think students might include in their answers. It is not an exhaustive list of marking points and students do not have to cover every point in the list to achieve full marks.

Students may respond with relevant, correct science that hasn't been included in the indicative content. If this is appropriate, then the student will be credited.

Some mark schemes include further guidance to examiners on what students need to do to achieve a certain level (usually the top level). This enables examiners to mark consistently.

GCSE science levels descriptors

The mark scheme uses generic level descriptors linked to the specific command word.

Calculate/Determine: use numbers/data to work out the answer.
A multi-step calculation worth 4, 5 or 6 marks with a points scheme.

Compare: describe the similarities and/or differences between things, not just write about one.
4 or 6 marks with two level descriptors.

Level 2: Scientifically relevant features are identified; the way(s) in which they are similar/different is made clear and (where appropriate) the magnitude of the similarity/difference is noted.	3–4 or 4–6
Level 1: Relevant features are identified and differences noted.	1–2 or 1–3
No relevant content	0

Describe: recall some facts, events or process in an accurate way.
4 or 6 marks with two level descriptors.

Level 2: Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	3–4 or 4–6
Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1–2 or 1–3
No relevant content	0

Design/Plan/Describe a method: set out in a logical order how something can be done to lead to a valid outcome.
6 (or 4) marks with three (or two) level descriptors.

Level 3: The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.	5–6
Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.	3–4
Level 1: The method plan would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1–2
No relevant content	0

Evaluate: use the information supplied, as well as knowledge and understanding, to consider evidence for and against. Make a judgement about the value of something with a respect to a particular purpose.
The response is based on analysis so identification of relevant features is necessary and the use of relevant criteria. Response might need to look critically from a number of angles.
6 (or 4) marks with three (or two) level descriptors.

Level 3: A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.	5–6
Level 2: Some logically linked reasons are given. There may also be a simple judgement.	3–4
Level 1: Relevant points are made. They are not logically linked.	1–2
No relevant content	0

Explain: clarify by describing in more detail or revealing additional, relevant facts. Give causes or motivating factors of why something has happened.
6 (or 4) marks with three (or two) level descriptors.

Level 3: Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5–6
Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logically linking. The resulting account is not fully clear.	3–4
Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2
No relevant content	0

Pre-session health check

Grade the area of development statements according to your confidence where 0 is not confident at all and 5 is very confident.

Hand back to your Head of Department.

Area of development	Grading 0-5	Reasons/notes/previous training
I can accurately apply a levels of response mark scheme to a variety of student extended response questions.		
My teaching involves student engagement with, and effective practice of, command words and levels of response mark schemes for extended response questions.		
I understand the response required by each command word at each level of the generic levels of response mark scheme.		
I know what I need to do to help improve students' ability to respond appropriately to command words at the correct level in different extended response questions on different topics.		

Post-session health check

Grade the area of development statements according to your confidence where 0 is not confident at all and 5 is very confident.

Area of development	Grading 0-5	Reasons/notes
I can accurately apply a levels of response mark scheme to a variety of student extended response questions.		
My teaching involves student engagement with, and effective practice of, command words and levels of response mark schemes for extended response questions.		
I understand the response required by each command word at each level of the generic levels of response mark scheme.		
I know what I need to do to help improve students' ability to respond appropriately to command words at the correct level in different extended response questions on different topics.		

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