AQA
Realising potential

# GCSE Maths Focus on:

## A02 exam questions

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

**Pre-reading booklet**

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# Contents


| Contents | Page |
|---|---|
| Using this pack | 4 |
| Summary of activities | 5 |
| Training session route map | 6 |
| Introduction to AO2 | 7 |
| What each strand of AO2 means in terms of exam questions | 8 |
| How to include the different strands in class work | 9 |
| Pre-session health check | 10 |
| Post-session health check | 11 |


AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# Using this pack

This resource pack is intended to help you deliver a CPD session for teaching colleagues on GCSE Maths (Asessment Objective 2) giving them the opportunity to explore how it is assessed and consider implications for the classroom.

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.

## Before the session

- Ask your colleagues to each complete the pre-session health check (page 9 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

- Establish why focusing on AO2 questions is beneficial to students and how these questions are assessed.
- Remind teachers that AO2 questions will be asked at all levels of demand, and that marks are available for progress made and not just complete solutions.
- The presentation will provide guidance and discussion questions to move you through your bespoke session.

## After the session

- Ask your colleagues to complete the post-session health check (page 10 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.

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# Summary of activities

## Activity 1

Most teachers are aware that Assessment Objective 2 refers to reasoning, but they may not be aware of the different facets of AO2 which we are required to assess in our papers and how the necessary skills can be developed in class. This initial activity is designed to develop a deeper understanding of what AO2 covers and starts the process of formulating ideas about how this understanding can be used in lesson design. The activity will include:

- using the Ofqual strand document for AO2 to highlight the skills students need to develop in lessons
- some suggested key points which have been highlighted on slides 5 and 6 of the presentation.

## Activity 2

Using the Ofqual strand document from Activity 1, identify which strand the questions items provided in the *Activities booklet* are targeting. The answers are given on slide 10.

## Activity 3 (Group discussion)

Discuss the use of AO2 in the curriculum. Every topic area in the curriculum could be assessed through questions which also target AO2. Therefore, consideration should be given to these skills when preparing lessons for each and every topic.

## Activity 4

This activity is designed to develop a deeper understanding of each strand of AO2 with further explanation, exemplification and ideas for the classroom for each strand. Colleagues will be required to:

- examine assessment tasks students might be required to do for each strand of AO2 and list actions/reminders of things to do in lessons to help students develop these skills. Add any strategies students could use to access the questions more successfully. You may also want to discuss what resources will help to develop these skills.
- some suggestions are provided on the slide following the explanation of each strand.
- it is important to emphasise that the exam questions are examples and do not cover all the possible ways of assessing AO2. Hence, classroom activities should focus more on building skills than on simply practicing exam questions.

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

AQA
Realising potential

# A02 exam questions route map

## Area for development

| | | | | |
|---|---|---|---|---|
| Does the team know what A02 is designed to assess? | Does the team know which strand A02 questions target? | Does the team understand the relationship between A02 and the curriculum? | Does the team require a deeper understanding of each strand of A02? | Does the team possess ideas for embedding strands into delivery? |
| Activity 1<br>Slides 4-6 | Activity 2<br>Slides 7-10 | Group Discussion<br>Activity 3 | Activity 4 | Embedding A02 into the classroom<br>Slides 13-24 |
| Ofqual GCSE Subject Level Guidance for mathematics June 2015 | | Embedding A02 into the classroom<br>Slides 13-24 | | |

Copyright © 2021 AQA and its licensors. All rights reserved.
AQA Education (AQA) is a registered charity (registered charity number 1073334) and a company limited by guarantee registered in England and Wales (company number 3644723).
Registered address: AQA, Devas Street, Manchester M15 6EX.
G02273_83c

# Introduction to AO2 questions

AO2 covers the skill of mathematical reasoning as well as communicating and interpreting information mathematically.

These skills go beyond routine procedures, therefore, it is important to give students plenty of opportunities in class to develop their reasoning skills and gain lots of exposure to different representations and links between them.

25% of the marks are allocated to AO2 at Foundation Tier and for Higher Tier the figure is 30%. In addition, many of these questions will also include AO1 marks for routine procedure. This means that the proportion of questions featuring some AO2 is even higher and teachers should consider reflecting this in the time given over to reasoning in the classroom.

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# What each strand of AO2 means in terms of exam questions

**Strand 1** is the most straightforward strand, where students need to make a deduction or inference which goes just beyond the routine. Inferences are not certain, and the deduction made is only likely rather than definitive.

**Strand 2** requires students to make chains of reasoning either to achieve a given result or - if the result is not given - then the answer will need to be given in a specific, requested format.

**Strand 3** involves communicating and interpreting and will often involve diagrams, charts and different representations. Either the diagram, chart etc will be given and students will have to interpret them in a way that is not the most obvious way, or they may be given information and asked to represent it in a different way, communicating mathematically using a different representation.

**Strand 4** requires students to present arguments and it will often be a 'show that' question. At Higher Tier only, students will be asked to develop and present more comprehensive 'proofs.'

**Strand 5** refers to the evaluation of given arguments and given ways of presenting information. Students will be required to assess the validity of arguments and criticise a diagram or interpretation of some given information.

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# How to include the different strands in class work

**Strand 1**: This is the most common strand of AO2 and students should get plenty of practice making deductions in every mathematical situation. Encourage them to make links which are not explicit.

**Strand 2**: Constructing chains of reasoning may be daunting at first and so some students may benefit from being given the steps first and then asked to explain them, before asking them to do it all for themselves. Asking students to explain reasoning to each other can be a useful group activity.

**Strand 3**: Encourage students to think of the many different possible representations of information, how to move between them, and what can be deduced or inferred from each.

**Strand 4**: At Foundation Tier, this strand is similar to AO2.1 and AO2.2, but usually requires a bit more sophistication. At Higher Tier, more formal proofs may be required so students should be exposed to more formal examples in the classroom. There are no ‘standard proofs’ to learn so students should have experience of constructing their own in class.

**Strand 5**: Evaluating arguments and criticising presentations may seem like difficult concepts to explain to students, but most of the examples in question papers will be scenarios where common misconceptions or mistakes are presented. Students often only have to spot the mistakes and perhaps also explain why they are wrong. In the classroom, this means mistakes can be celebrated as they provide good practice of this kind of question.

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# 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 assign exam questions to each strand of AO2. | | |
| My teaching involves student engagement with, and effective practice of, AO2 questions. | | |
| I understand how and when to include each strand of AO2 in my teaching. | | |
| I know what I need to do to help improve students' ability to respond appropriately to AO2 questions on different topics. | | |

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# 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. You should use this check to measure your progress against the Pre-Session health check.

| Area of development | Grading 0-5 | Reasons/notes |
|---|---|---|
| I can accurately assign exam questions to each strand of AO2. | | |
| My teaching involves student engagement with, and effective practice of, AO2 questions. | | |
| I understand how and when to include each strand of AO2 in my teaching. | | |
| I know what I need to do to help improve students' ability to respond appropriately to the different types of AO2 questions on different topics. | | |

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.

# Notes

# Notes

## Contact us

**T:** 0161 957 3852
**E:** maths@aqa.org.uk

aqa.org.uk

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX.