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**Cambridge 9709 AS/A Level
Mathematics
Extension Training - Day 1**




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Session 1

Welcome and introduction.



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Housekeeping and general points

- Health and safety
- Fire safety – alarms and exits
- Washrooms
- Refreshments
- Mobile telephones
- Pack contents








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Timetable

Day 1	
08:00 - 09:00	Registration
09:00 - 09:15	Welcome and introduction
09:15 - 10:00	Review of the syllabus
10:00 - 10:30	Identifying underpinning knowledge
10:30 - 10:50	Break
10:50 - 12:30	The assessment and closing the loop
12:30 - 13:30	Lunch
13:30 - 14:30	Teaching approaches
14:30 - 14:50	Break
14:50 - 16:30	Sharing teaching approaches
16:30 - 16:50	Appropriate challenge
16:50 - 17:00	Close






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About us


Cambridge International Examinations prepare school learners for life, helping them develop an informed curiosity and a lasting passion for learning. We are part of Cambridge Assessment, a department of the University of Cambridge.

Our international qualifications are recognised by the world's best universities and employers, giving learners a wide range of options in their education and career. As a not-for-profit organisation, we devote our resources to delivering high-quality educational programmes that can unlock learners' potential.





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What is the Cambridge programme?

Cambridge Primary
 5 to 11 years*

Cambridge Secondary 1
 11 to 14 years*

Cambridge Secondary 2
 14 to 16 years*

Cambridge Advanced
 16 to 19 years*

Cambridge Primary
 Cambridge Primary
 Checkpoint
 Cambridge ICT Starters

Cambridge Secondary 1
 Cambridge Secondary 1
 Checkpoint
 Cambridge ICT Starters

Cambridge IGCSE®
 Cambridge O Level

Cambridge International
 AS & A Level
 Cambridge Pre-U

- A global curriculum
- 21st century skills
- International perspective

*Age ranges are for guidance only

Extension course aims

The aims of this course are to:

- review the syllabus requirements
- explore different teaching strategies
- develop schemes of work
- understand the assessment process
- explore the use of assessment documents to inform teaching

Session 2 – the syllabus

The objective of this session is to ensure that you understand the objectives, content and structure of the syllabus.

Activity 1 – quiz

You have 20 minutes for the quiz. Please follow these instructions:

- answer all questions
- work in pairs
- use the syllabus document to help you
- ask if there are any words in the quiz or syllabus which you do not understand.

Activity 1 – answers


1. A, unless the candidates are in India, in which case it is D.
2. D, but this is approximate – some centres will take longer, others will use less time.
3. B two papers
4. C four papers
5. D 1 hour 45 minutes

Activity 1 – answers


6. B 1 hour 15 minutes
7. A, B and D
8. A and C. The other possible combinations is Statistics 1 and Statistics 2.
9. A there are no time restrictions
10. B, C and D
11. A there is only one assessment objective

Activity 1 – answers

12. C six
13. A Pure Mathematics 1 and C Mechanics 1
14. B degrees and C radians
15. D histogram
16. B normal and frictional components
17. C A* to E
18. D a calculator



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Activity 1 – answers

19.B a booklet including mathematical formula and normal distribution tables

20.A further studies or going into employment




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Syllabus aims

- To develop learners' mathematical knowledge and skills in such a way which encourages confidence and provides satisfaction and enjoyment.
- To develop an understanding of mathematical principles and an appreciation of mathematics as a logical and coherent subject.



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Syllabus aims

- Acquire a range of mathematical skills, particularly those which will enable learners to apply mathematics in the context of everyday situations.
- Develop the ability to analyse problems logically, recognise when and how a situation may be represented mathematically, identify and interpret relevant factors and, where necessary, select an appropriate mathematical method to solve the problem.

Syllabus aims

- Use mathematics as a means of communication with emphasis on the use of clear expression.
- Acquire the mathematical background necessary for further study in this or related subjects.

Assessment objective

The AO is outlined in the syllabus. Two points to note are shown below:

- Apply combinations of mathematical skills and techniques in solving problems
- Present mathematical work, and communicate conclusions, in a clear and logical way

Questions

- Please write on the post-it notes any questions that you would like to be answered by the end of the course.



Session 3 – assessing knowledge

The objective of this session is to understand the underpinning knowledge of the course and how this is assessed.


Learner strengths and weaknesses


It is important to assess areas of strength and weakness in your learners' knowledge. You can do this by:

- using a checklist after a topic has been taught
- focusing on areas you know are challenging either to teach or learn.

Activity 2


- Look at section 6 of the syllabus.
- The cards show the knowledge/skills required to underpin this section.
- Rank the cards to show how essential this knowledge/skills area is – cards may be ranked as equal and you may add your own cards.


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Current ability and knowledge level


Please discuss in groups where you think most learners would have good previous knowledge or skills and where they would need most support.


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Break

- Please be back in 20 minutes.
- Refreshments are available.

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Session 3 *continued*

Developing an initial assessment for a topic

Activity 3

Develop an initial assessment for the section of the syllabus looked at in Activity 2.

Reviewing the initial assessment

Qn	Knowledge/Skill	RAG	Resource	Target	Reviewed
1					
2					
3					
4					

Closing the loop



Using the learner checklist

Look at your learner checklist which can be used at two points in the learning:


1. Immediately following a unit of study – learners could be asked to RAG rate their understanding of the unit and possible then help each other to improve understanding.
2. Revision of the whole syllabus or sections of the syllabus in preparation for assessment.

Activity 4


- Look at the teacher checklist that you have been given and RAG (Red, Amber, Green) rate both your confidence to deliver each area and how well your learners understand.
- In groups of three, each person should present a problem area (one rated red) and the groups should discuss potential solutions.
- Please spend 10 minutes discussing each problem area.

Closing the loop – a reminder






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Lunch

- Please be back in 1 hour.




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Session 4 – teaching approaches

The objective of this session is to explore a variety of different teaching approaches.




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Activity 5 – in groups:


- discuss the teaching approach you have been given and chose a suitable topic from the syllabus to apply this method to
- plan how you would create a logical progression of learning and assessment on this topic
- Identify necessary resources
- you will be asked to present your delivery plan to your rainbow group at the end of this session.


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Flipped learning

- Learners are given material – usually online – to introduce and/or research the topic before the formal classroom experience begins.
- This can be done either at home or in the classroom.
- Resources can be developed in school and/or found online.


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Flipped learning

- Learners watch the video at home before the lesson.
- They make notes of the tips given in the video.
- They complete the online quiz.
- In class, elicit what the tips were and complete a range of tasks to practise the tips.

<https://www.khanacademy.org/math/algebra/quadratics/solving-quadratics-by-completing-the-square/v/solving-quadratic-equations-by-completing-the-square>

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Enquiry based learning

- Learners carry out research (enquiries) into the topic and look at questions and problems.
- The 5 Ws and an H approach may be useful – What, Why, Who, When, Where and How.
- Resources could include textbooks and the internet
- This can be done in collaboration with other learners or with staff.
- The research tasks are open-ended enabling individual response.

Group work 1

Within simple group work it is often useful to assign roles commonly:

- Facilitator
- Recorder
- Summariser
- Presenter

Group work 2

Think, pair share is a co-operative discussion strategy. It works by:

- provoke **thinking** with a question, prompt or observation
- allowing learners to **pair** up to compare notes
- pairs can **share** their thinking with the rest of the class

Break

Please be back in 20 minutes.
Refreshments are available.

Group work 3

Rainbow grouping is where learners work in groups of up to 6 on a topic:

- they are given cards so that in each group each learner has a different coloured card
- groups then reform by colour and learners feedback to their new group.

Practising rainbow grouping

- You will have been allocated a colour while in your original group.
- Regroup with others of the same colour and explain the teaching method that you have been developing.

Stretch and challenge

- Tomorrow morning we will be discussing stretching and challenging able learners.
- How do you extend and stimulate the thinking of more able pupils during whole-class teaching?

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Supporting the weaker learner

- We will also discuss support for less able learners
- How can you support and encourage less able learners during whole-class teaching?

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End of day 1

- Thank you for taking part in today's training.
- Please stay behind now if you have any further questions.

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Thank you



A
