UNIVERSITY of CAMBRIDGE
International Examinations

Syllabus Outline

Cambridge IGCSE
INTERNATIONAL MATHEMATICS

Cambridge IGCSE International Mathematics

CIE has worked with mathematics teachers in international schools to create Cambridge IGCSE International Mathematics in response to requests for a mathematics course that reflects their style of teaching.

All Cambridge IGCSE mathematics syllabuses spring from common principles: they enable students to develop a good foundation of mathematics skills and to learn to develop strategies for solving open-ended problems. They also promote a positive attitude towards the subject and a confidence with mathematics that leads to further enquiry.

The introduction of Cambridge IGCSE International Mathematics offers schools even more choice when it comes to selecting a mathematics course that is right for their students. Cambridge IGCSE International Mathematics has been designed for international schools that want their mathematics teaching to focus more on investigations and modelling, and which better utilises the powerful technology of graphical calculators. The course integrates well with the approach to teaching of mathematics in IB schools.

The course is divided into a core tier, and an extended tier. The syllabus also introduces students to the history of mathematics and its cultural significance.

Cambridge IGCSE – Foundation for success

Cambridge IGCSE is the world's most popular international qualification for 14 – 16 year olds. There are more than 70 subjects to choose from.

Cambridge developed the IGCSE in 1985, as an international alternative to the 'UK-centric' GCSE. Cambridge IGCSEs are designed to avoid cultural bias and to be accessible for students with good English skills but who are not native speakers.

Students who attain IGCSE qualifications are well-educated, adaptable and thoroughly prepared for their next steps in education and employment. Cambridge IGCSEs provide a solid foundation for higher level national and international courses such as A/AS Levels, the IB Diploma and the US Advanced Placement programme.

Reporting of achievement

Cambridge uses an eight-point grade scale: A*, A, B, C, D, E, F and G. Grade A* is awarded for the highest level of achievement, and grade G indicates minimum satisfactory performance.

Cambridge IGCSE International Mathematics assessment objectives

The examinations test the ability of candidates to know and apply concepts from the whole course. Students will develop the ability to:

- Solve problems by applying combinations of mathematical skills and techniques, using investigation, analysis, deduction and an appropriate strategy;
- Recognise patterns and structures and form generalisations;
- Draw logical conclusions from information and understand the significance of statistical results;
- Use the concepts of mathematical modelling to describe a real-life situation and draw conclusions;
- Organise, interpret and present information in written, tabular, graphical and diagrammatic forms, using the correct notation and terminology;
- Use statistical techniques to explore relationships in the real world;
- Make effective use of technology.

Scheme of Assessment

	Duration	Marks	Weighting	Type of assessment
Core Tier Grades available: C to G				
Paper 1	45m	40	25%	10 – 12 short response questions. No calculators permitted.
	This paper assesses knowledge and the use of basic skills and methods. Any area of the syllabus may be assessed. Questions focus on concepts that can be assessed without access to a calculator.			
Paper 3	1h 45m	96	60%	11 – 15 medium to extended response questions. A graphics calculator is required.
	Any area of the syllabus may be assessed. Some of the questions will particularly assess the use of the graphics calculator.			
Paper 5	1h	24	15%	One investigation question. A graphics calculator is required.
	Candidates are assessed on their ability to investigate and solve a more open-ended problem. Clear communication and full reasoning is especially important and the mark scheme reflects this.			
Extended Tier Grades available: A* to E				
Paper 2	45m	40	20%	10 – 12 short response questions. No calculators permitted.
	This paper assesses knowledge and the use of basic skills and methods. Any area of the syllabus may be assessed. Questions focus on concepts that can be assessed without access to a calculator.			
Paper 4	2h 15m	120	60%	11 – 15 medium to extended response questions. A graphics calculator is required.
	Any area of the syllabus may be assessed. Some of the questions will particularly assess the use of the graphics calculator.			
Paper 6	1h 30m	40	20%	One investigation question. A graphics calculator is required.
	Candidates are assessed on their ability to investigate and solve a more open-ended problem. Clear communication and full reasoning is especially important and the mark scheme reflects this.			

Curriculum Content

These are topic areas covered in the Cambridge IGCSE International Mathematics curriculum. For the full curriculum requirements, please check the syllabus at www.cie.org.uk/igcse

Core Tier	**Extended Tier** All of the core curriculum plus the following:
Number Vocabulary and notation; Operations and brackets; Common factors and multiples; Powers and roots; Ratio and proportion; Decimals, fractions, ratios and percentages; Percentages (eg interest and profit); Exponents; Estimating and rounding; Calculations involving time; Speed distance and time.	**Number** + Absolute value x; Surds (radicals); Rationalisation of the denominator.
Algebra Interpretation of inequalities; Linear inequalities and equations; Indices; Derivation; Simultaneous linear equations; Expansion of brackets; Factorisation; Algebraic fractions; Solving equations with graphics calculator; Sequences.	**Algebra** + Quadratic equations; Variation.
Functions Domain and range; Mapping diagrams; Asymptotes; Sketching graph of function using graphics calculator; Description and identification; Logarithmic function as the inverse of the exponential function.	**Functions** + Recognition of function types from the shape of their graphs; Finding quadratic function; Simplified formula for expressions; Inverse function.
Geometry Vocabulary; Line and rotational symmetry; Angle measurement in degrees; Angles and shapes; Similarity; Theorem of Pythagoras; Properties of Circles.	**Geometry** + Area and volume scale factors; cyclic quadrilateral.
Transformations in Two Dimensions Notation; Transformation on the Cartesian plane.	**Transformations in Two Dimensions** + Vectors; Magnitude; Inverse of a transformation; Combined transformations.
Mensuration Units; Perimeter and area; Circumference and area; Surface area and volume; Areas of compound shapes.	**Mensuration** + Convert between units; Area of a triangle; Surface area and volume.
Coordinate Geometry Plotting of points; Distance; Midpoint; Gradient; Equation of straight line; Symmetry of diagrams or graphs in Cartesian plane.	**Coordinate Geometry** + Linear inequalities on the Cartesian plane.
Trigonometry Right-angled triangle trigonometry; Applications; Problems in two dimensions; Compound shapes.	**Trigonometry** + Values for trig ratios; Extension to four quadrants; Sine Rule; Cosine Rule; Area of triangle; Properties of graphs.
Sets Notation for elements; Subsets; Universal sets; Complements; Descriptive form; Venn diagrams; Intersection of sets.	
Probability Probability as a fraction, decimal or percentage; Relative frequency; Expected number of occurrences; Combining events; Tree diagrams; Probabilities of Venn Diagrams.	

Support and Resources

CIE offers a programme of Cambridge IGCSE workshops and distance learning for teachers, accompanied by support materials on the Cambridge Teacher Support website. More details are available on **www.cie.org.uk/events**

Full syllabus details are available from **www.cie.org.uk/igcse**

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