Cambridge IGCSE Mathematics (US) 0444 Syllabus Breakdown & Weekly Lesson Plan

Important Note: The 0444 syllabus is nearly identical to 0580 but tailored for US educational standards with terminology adjustments (e.g., "trapezoid" vs "trapezium") and is only available to schools in Arizona

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Assessment Structure

Core Tier (Grades C-G):

- Paper 1: Non-calculator, 1h, 40 marks
- Paper 3: Calculator, 2h, 80 marks

Extended Tier (Grades A-E)*:

- Paper 2: Non-calculator, 2h, 100 marks (50%)
- Paper 4: Calculator, 2h, 100 marks (50%)

Assessment Objectives :

- **AO1 Knowledge & Understanding**: 45-55%
- **AO2 Problem Solving & Communication**: 45-55%

Topic Weightings (Extended Papers 2 & 4)

Topic Area	Weighting	Weeks Allocated
Number	15-20%	3 weeks
Algebra (Algebra, Functions, Equations, Graphs)	35-40%	5.5 weeks
Geometry & Trigonometry (Geometry, Transformations, Vectors, Measurement)	25-30%	4.5 weeks
Statistics & Probability	10-15%	2 weeks
Revision & Exam Practice	-	2 weeks

Detailed 16-Week Lesson Plan

WEEK 1-3: NUMBER (15-20% weight)

Week 1: Number Operations & Properties

- Day 1: Number sets (natural, integer, rational, irrational), Venn diagrams, prime factorization
- Day 2: Four operations, mental vs written methods, order of operations
- Day 3: Multiples, factors, GCF, LCM, prime factor applications
- Day 4: Past paper practice: Number techniques (Paper 2)
- Day 5: **Non-calculator focus**: Efficient mental calculation strategies
- Day 6: Past paper review: Common calculation errors

Week 2: Indices, Surds & Standard Form

- Day 1: Index laws (positive, negative, zero, fractional), scientific notation
- Day 2: Surds - simplifying, rationalizing denominators (Extended only)
- Day 3: Calculations with exponents, solving simple exponential equations
- Day 4: Past paper practice: Indices and surd manipulation
- Day 5: **Calculator focus**: Standard form calculations
- Day 6: Past paper review: Surd rationalization errors

Week 3: Ratio, Proportion & Financial Math

- Day 1: Ratio, proportion, direct/inverse variation, unit conversion
- Day 2: Percentages (increase/decrease, reverse, profit/loss, multi-step)
- Day 3: Simple & compound interest, depreciation, exponential growth
- Day 4: Past paper practice: Financial mathematics problems
- Day 5: **Practical**: Real-world percentage applications
- Day 6: **Full Paper 2 practice** (non-calculator number focus) + review

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WEEK 4-8: ALGEBRA & FUNCTIONS (35-40% weight)

Week 4: Algebraic Manipulation & Equations

- Day 1: Expanding, factorizing (quadratics, difference of squares), algebraic fractions
- Day 2: Linear equations, rearranging formulas, subject of formula
- Day 3: Quadratic equations (factorizing, formula, completing square)
- Day 4: Past paper practice: Equation solving (Paper 2)

- Day 5: **Non-calculator**: Completing square technique
- Day 6: Past paper review: Quadratic formula application errors

Week 5: Functions & Graphs - Core Concepts

- Day 1: Function notation, domain/range, mapping diagrams, inverse functions
- Day 2: Composite functions, modulus functions, graphing $y=|f(x)|$
- Day 3: Quadratic functions, discriminants, turning points, intercepts
- Day 4: Past paper practice: Function problems (Paper 4)
- Day 5: **Graph skills**: Sketching quadratics without calculator
- Day 6: Past paper review: Domain/range identification errors

Week 6: Advanced Functions & Graphing

- Day 1: Exponential & logarithmic functions, graphing, asymptotes
- Day 2: Trigonometric functions (sin, cos, tan) for 0°-360°, graphs
- Day 3: Transformations (translation, reflection, stretch, enlargement)
- Day 4: Past paper practice: Function transformations
- Day 5: **Calculator focus**: Using graphing to solve $f(x)=g(x)$
- Day 6: Past paper review: Transformation description errors

Week 7: Coordinate Geometry & Advanced Algebra

- Day 1: Straight line graphs, gradient, intercepts, parallel/perpendicular
- Day 2: Equation of a line, distance formula, midpoint, slope relationships
- Day 3: Coordinate geometry of circles (center-radius form, tangents)
- Day 4: Past paper practice: Line and circle problems
- Day 5: **Problem-solving**: Finding circle equations from points
- Day 6: Past paper review: Perpendicular slope errors

Week 8: Algebra Consolidation & Assessment

- Day 1: Mixed algebra problems (all functions, equations, graphs)
- Day 2: **Full Paper 2 mock** (non-calculator algebra focus)
- Day 3: **Full Paper 4 mock** (calculator algebra focus)
- Day 4: Detailed review, identify weak areas in algebra

- Day 5: Targeted revision: Functions and quadratics
- Day 6: Formula and technique consolidation

WEEK 9-13: GEOMETRY & TRIGONOMETRY (25-30% weight)

Week 9: Geometry Fundamentals & Circle Theorems

- Day 1: Vocabulary (acute, obtuse, reflex, isosceles, trapezoid, etc.)
- Day 2: Angles (parallel lines, polygons, interior/exterior angles)
- Day 3: Circle theorems (tangent-radius, angle at center/circumference)
- Day 4: Past paper practice: Angle and circle problems
- Day 5: **Construction**: Compass/straightedge constructions
- Day 6: Past paper review: Circle theorem justification errors

Week 10: Similarity, Congruence & Measurement

- Day 1: Similarity, scale factors, calculation of lengths/areas
- Day 2: Congruence criteria (SSS, SAS, ASA, RHS), proving congruence
- Day 3: Geometrical measurement (perimeter, area, surface area, volume)
- Day 4: Past paper practice: Similarity and mensuration problems
- Day 5: **Calculator focus**: Complex measurement calculations
- Day 6: Past paper review: Similarity vs congruence confusion

Week 11: Trigonometry - Right-Angled & Advanced

- Day 1: SOHCAHTOA, Pythagorean theorem, exact values (30°,45°,60°)
- Day 2: Sine Rule (Law of Sines), Cosine Rule (Law of Cosines)
- Day 3: Area of triangle (½absinC), 3D trigonometry applications
- Day 4: Past paper practice: Trigonometry extended problems
- Day 5: **Non-calculator trig**: Using exact values
- Day 6: Past paper review: Sine/Cosine rule selection errors

Week 12: Transformations & Vectors

- Day 1: Transformations (translation, reflection, rotation, enlargement)
- Day 2: Vector notation, addition, subtraction, scalar multiplication

- Day 3: Magnitude, position vectors, vector geometry applications
- Day 4: Past paper practice: Transformation and vector problems
- Day 5: **Vectors**: Proving parallel/collinear points
- Day 6: Past paper review: Vector direction errors

Week 13: Geometry & Trigonometry Consolidation

- Day 1: Mixed geometry problems
- Day 2: Mixed trigonometry problems
- Day 3: Construction and loci problems
- Day 4: Past paper practice: Extended response questions
- Day 5: **Problem-solving**: Multi-step geometry/trig problems
- Day 6: **Full Paper 4 practice** (Geometry focus)

WEEK 14: STATISTICS & PROBABILITY (10-15% weight)

Week 14: Data Analysis & Chance

- Day 1: Data interpretation (graphs, tables, charts), discrete/continuous data
- Day 2: Measures of central tendency (mean, median, mode), range, quartiles
- Day 3: Probability (fraction/decimal/percentage), expected occurrences
- Day 4: Combined events (addition & multiplication rules), tree diagrams
- Day 5: **Calculator focus**: Statistical calculations
- Day 6: Past paper review: Probability rule application errors

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WEEK 15-16: REVISION & EXAM PRACTICE

Week 15: Mock Exams & Targeted Revision

- Day 1: **Full Paper 2 mock** (non-calculator, 2h)
- Day 2: **Full Paper 4 mock** (calculator, 2h)
- Day 3: Detailed analysis of mocks, identify weak topics
- Day 4: Targeted revision: Algebra & Functions
- Day 5: Targeted revision: Geometry & Trigonometry

- Day 6: Formula recall and technique practice

Week 16: Final Preparation

- Day 1: Command words workshop (calculate, explain, justify, show)
- Day 2: Exam technique: Time management (1.2 min per mark)
- Day 3: **Final Paper 2 mock** (exam conditions)
- Day 4: **Final Paper 4 mock** (exam conditions)
- Day 5: Review of final mocks, confidence building
- Day 6: Light revision, exam day checklist, Q&A

Past Paper Integration Strategy

1. **Topic-wise practice**: 3-5 questions after each sub-topic from topic booklets
2. **Weekly mixed practice**: Every week includes one full paper section
3. **Calculator vs Non-calculator**: Alternate practice between Paper 2 and Paper 4 style
4. **Progressive difficulty**: Start with Core questions, move to Extended
5. **Cumulative testing**: Every 2 weeks, mixed topic test covering all topics taught

Key Resources:

- **Official syllabus**:

0444 syllabus for 2022-2024

- **Past papers**: 2019-2024 series (0580 papers are nearly identical)
- **Formula list**: Provided in exam (see syllabus Section 4)
- **Calculator**: Scientific calculator required for Papers 3 & 4

US-Specific Notes:

- Only available to schools in Arizona
- Uses US terminology (trapezoid, line segment, etc.)
- Aligns with US Common Core State Standards
- Command words match US assessment practices