GCSE (9-1) Mathematics

Mr Davies

Acting Head of Maths

GCSE Maths changes

More demanding for everyone:

- • MORE subject content
- • MORE demand of content
  - Higher Tier students
  - Foundation Tier students
- • MORE time for the examinations
  - 3 x 1.5 hour exams
- • MORE emphasis on:
  - Problem solving
  - Mathematical reasoning
- • Formulae provided in examinations
  - LESS

Why these changes?

- Designed to help students emerge from GCSE Maths with a level of confidence and fluency that will provide a genuine foundation for the rest of their learning and working lives.

Paper 1 is non-calculator.

All 3 papers must be sat at the same tier.

Equally weighted

80 marks per paper

Topics new to Foundation

- Index laws: zero and negative powers (numeric and algebraic)
- Standard form
- Compound interest and reverse percentages
- Direct and indirect proportion (numeric and algebraic)
- Expand the product of two linear expressions
- Factorise quadratic expressions in the form $x^2 + bx + c$
- Solve linear/linear simultaneous equations
- Solve quadratic equations by factorization
- Plot cubic and reciprocal graphs, recognise quadratic and cubic graphs
- Trigonometric ratios in 2D right-angled triangles
- Fractional scale enlargements in transformations
- Lengths of arcs and areas of sectors of circles
- Mensuration problems
- Vectors (except geometric problems/proofs)
- Density
- Tree diagrams

Topics new to Higher

- Expand the products of more than two binomials
- Interpret the reverse process as the ‘inverse function’; interpret the succession of two functions as a ‘composite function’ (using formal function notation)
- Deduce turning points by completing the square
- Calculate or estimate gradients of graphs and areas under graphs, and interpret results in real-life cases (not including calculus)
- Simple geometric progressions including surds, and other sequences
- Deduce expressions to calculate the nth term of quadratic sequences
- Calculate and interpret conditional probabilities through Venn diagrams

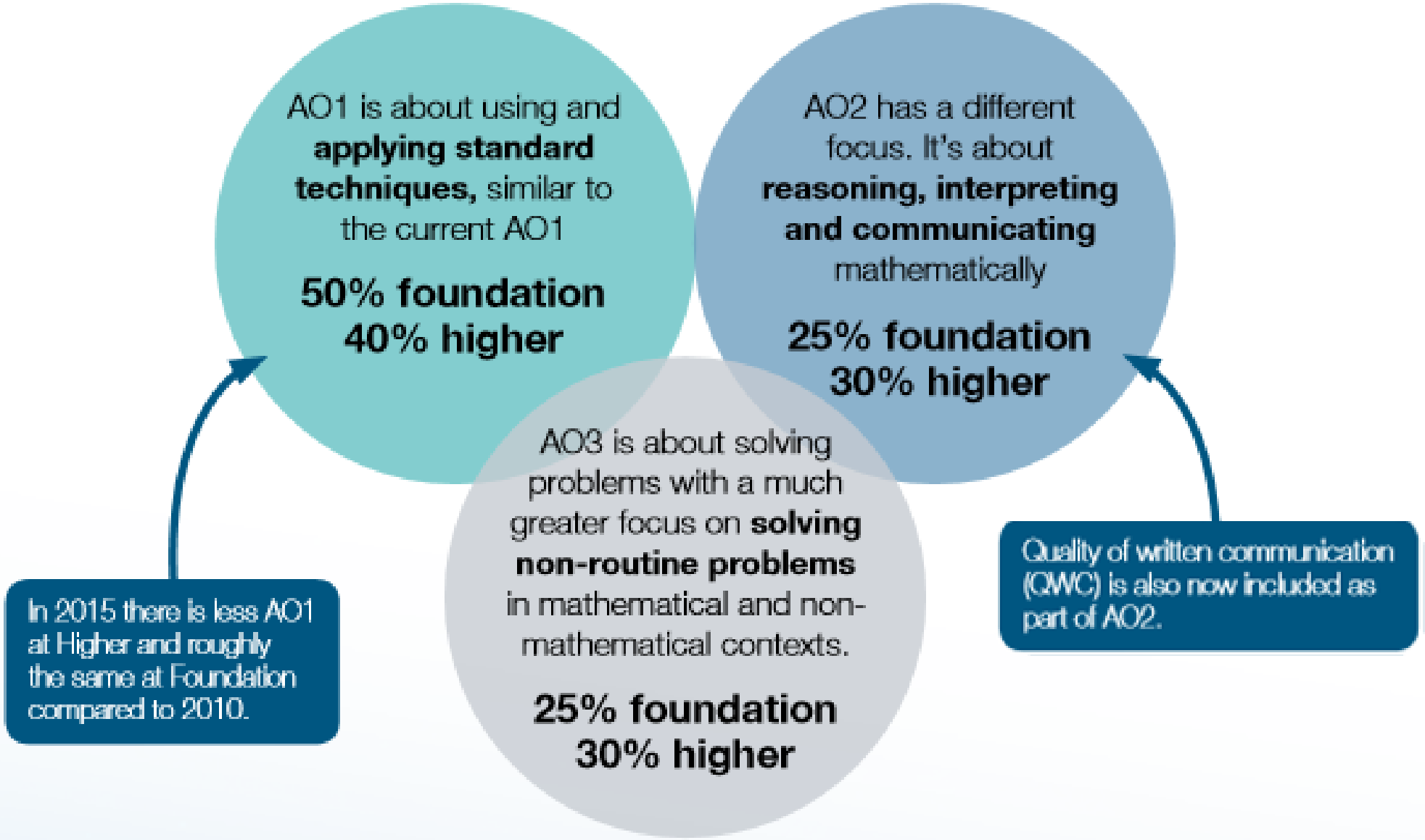
Topics new to both tiers

- Use inequality notation to specify simple error intervals
- Identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically
- Fibonacci type sequences, quadratic sequences, geometric progressions
- Relate ratios to linear functions
- Interpret the gradient of a straight line graph as a rate of change
- Know the exact values of sin θ and cos θ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60°

Topics omitted

- Trial and improvement
- Tessellations
- Isometric grids
- Imperial units of measure
- Questionnaires
- 3D coordinates
- Rotation and enlargement of functions

Key skills:


AO1 is about using and **applying standard techniques,** similar to the current AO1
50% foundation
40% higher
AO2 has a different focus. It's about **reasoning, interpreting and communicating** mathematically
25% foundation
30% higher
AO3 is about solving problems with a much greater focus on **solving non-routine problems** in mathematical and non-mathematical contexts.
25% foundation
30% higher
In 2015 there is less AO1 at Higher and roughly the same at Foundation compared to 2010.
Quality of written communication (QWC) is also now included as part of AO2.

How can you support at home?

- Encourage them to find solutions
- Support with homework
- Working scientific calculator
- Support with regular revision
- Last week of the summer
  - Maths Busters from CGP (£13)
    - Online video tutorials
    - Sets and marks questions
    - Exam practise
    - Assesses progress
  - CGP Workbook (£5)

Next steps

- GCSE paper – September 2016
- Next 3 topics (Foundation and Higher)
  - Measure and accuracy
  - Equations and inequalities
  - Circles and constructions
- Will continue to evolve