Subject Knowledge Audit – Mathematics

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| **Name:**  | **Date:**  |

**Topic list** covering all the statements in the **Key Stage 3 and Key Stage 4** programmes of study.

Knowledge/experience status

1 distant recall, but would benefit from reviewing of teaching and learning issues including misconceptions

2 confident of teaching topic, but no experience of seeing it (taught well) or doing it

3 have seen it taught and confident of teaching it

4 have taught successfully

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|  | Sep 2020 | in-course changes 1/1/21 | JuLY 2021 |
| NUMBER |  |  |  |
| * + [Place value](https://www.stem.org.uk/elibrary/list/13068/place-value)
 |  |  |  |
| * + [Four operations using decimals](https://www.stem.org.uk/elibrary/list/13069/four-operations-using-decimals)
 |  |  |  |
| * + [Four operations using fractions](https://www.stem.org.uk/elibrary/list/13070/four-operations-using-fractions)
 |  |  |  |
| * + [Four operations using positive and negative integers](https://www.stem.org.uk/elibrary/list/13072/four-operations-using-positive-and-negative-integers)
 |  |  |  |
| * + [Order of operations](https://www.stem.org.uk/elibrary/list/13071/order-of-operations)
 |  |  |  |
| * + [Measures](https://www.stem.org.uk/elibrary/list/15358/measures)
 |  |  |  |
| * + [Fractions and decimals](https://www.stem.org.uk/elibrary/list/15362/fractions-and-decimals)
 |  |  |  |
| * + [Percentages](https://www.stem.org.uk/elibrary/list/15359/percentages)
 |  |  |  |
| * + [Standard form](https://www.stem.org.uk/elibrary/list/15457/standard-form)
 |  |  |  |
| * + [Estimating answers](https://www.stem.org.uk/elibrary/list/15460/estimating-answers)
 |  |  |  |
| * + [Rounding](https://www.stem.org.uk/elibrary/list/15462/rounding)
 |  |  |  |
| * + [Using a calculator](https://www.stem.org.uk/elibrary/list/15607/using-calculator)
 |  |  |  |
| * + [Factors and multiples](https://www.stem.org.uk/elibrary/list/13275/factors-and-multiples)
 |  |  |  |
| * + [Powers and roots](https://www.stem.org.uk/elibrary/list/13513/powers-and-roots)
 |  |  |  |
| * + [Exact answers](https://www.stem.org.uk/elibrary/list/20593/exact-answers)
 |  |  |  |
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| GEOMETRY AND MEASURES |  |  |  |
| * + [Perimeter and area of shapes](https://www.stem.org.uk/elibrary/list/14872/perimeter-and-area-of-shapes)
 |  |  |  |
| * + [Surface area and volume](https://www.stem.org.uk/elibrary/list/14936/surface-area-and-volume)
 |  |  |  |
| * + [Compound units](https://www.stem.org.uk/elibrary/list/14999/compound-units)
 |  |  |  |
| * + [Measuring lines, angles and using scale drawings](https://www.stem.org.uk/elibrary/list/15035/measuring-lines-angles-and-using-scale-drawings)
 |  |  |  |
| * + [Geometrical properties of lines, angles and polygons](https://www.stem.org.uk/elibrary/list/15036/geometrical-properties-of-lines-angles-and-polygons)
 |  |  |  |
| * + [Geometrical properties of plane shapes](https://www.stem.org.uk/elibrary/list/15715/geometrical-properties-of-plane-shapes)
 |  |  |  |
| * + [Congruent triangles and similar shapes](https://www.stem.org.uk/elibrary/list/15716/congruent-triangles-and-similar-shapes)
 |  |  |  |
| * + [Angles in parallel lines](https://www.stem.org.uk/elibrary/list/14608/angles-in-parallel-lines)
 |  |  |  |
| * + [Pythagoras' theorem](https://www.stem.org.uk/elibrary/list/15718/pythagoras-theorem)
 |  |  |  |
| * + [Properties of 3D solids](https://www.stem.org.uk/elibrary/list/15709/properties-of-3d-solids)
 |  |  |  |
| * + [Interpreting mathematical relationships](https://www.stem.org.uk/elibrary/list/15691/interpreting-mathematical-relationships)
 |  |  |  |
| * + [Trigonometry](https://www.stem.org.uk/elibrary/list/21448/trigonometry)
 |  |  |  |
| * + [Vectors](https://www.stem.org.uk/elibrary/list/21502/vectors)
 |  |  |  |
| * + [Using angle facts and logical reasoning to derive results](https://www.stem.org.uk/elibrary/list/15717/using-angle-facts-and-logical-reasoning-to-derive-results)
 |  |  | * + 4
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| ALGEBRA: EXPRESSING RELATIONSHIPS |  |  |  |
| * + [Algebraic notation](https://www.stem.org.uk/elibrary/list/14693/algebraic-notation)
 |  |  |  |
| * + [Simplifying algebraic expressions](https://www.stem.org.uk/elibrary/list/14776/simplifying-algebraic-expressions)
 |  |  |  |
| * + [Arithmetic progressions](https://www.stem.org.uk/elibrary/list/13514/arithmetic-progressions)
 |  |  |  |
| * + [Other sequences](https://www.stem.org.uk/elibrary/list/15649/other-sequences)
 |  |  |  |
| * + [Graphs of linear functions](https://www.stem.org.uk/elibrary/list/15655/graphs-of-linear-functions)
 |  |  |  |
| * + [Graphs of quadratic functions](https://www.stem.org.uk/elibrary/list/15690/graphs-of-quadratic-functions)
 |  |  |  |
| * + [Interpretation of mathematical relationships](https://www.stem.org.uk/elibrary/list/15691/interpreting-mathematical-relationships)
 |  |  |  |
| * + [Manipulating algebraic expressions](https://www.stem.org.uk/elibrary/list/20946/manipulating-algebraic-expressions)
 |  |  |  |
| * + [Recognising standard graphs](https://www.stem.org.uk/elibrary/list/20933/recognising-standard-graphs)
 |  |  |  |
| * + [Transformations of graphs](https://www.stem.org.uk/elibrary/list/21267/transformations-of-graphs)
 |  |  |  |
| * + [Gradients and area under non-linear graphs](https://www.stem.org.uk/elibrary/list/21282/gradients-and-area-under-non-linear-graphs)
 |  |  |  |
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| ALGEBRA: USING EQUATIONS AND FUNCTIONS |  |  |  |
| * + [Substitution](https://www.stem.org.uk/elibrary/list/14780/substitution)
 |  |  |  |
| * + [Algebraic modelling](https://www.stem.org.uk/elibrary/list/14783/algebraic-modelling)
 |  |  |  |
| * + [Solving linear equations](https://www.stem.org.uk/elibrary/list/13515/solving-linear-equations)
 |  |  |  |
| * + [Graphical solutions to mathematical problems](https://www.stem.org.uk/elibrary/list/15740/graphical-solutions-to-mathematical-problems)
 |  |  |  |
| * + [Graphical solutions to problems in context](https://www.stem.org.uk/elibrary/list/15741/graphical-solutions-to-problems-in-context)
 |  |  |  |
| * + [Solving quadratic equations](https://www.stem.org.uk/elibrary/list/20952/solving-quadratic-equations)
 |  |  |  |
| * + [Interpretation of standard functions](https://www.stem.org.uk/elibrary/list/21281/interpretation-of-standard-functions)
 |  |  |  |
| * + [The circle](https://www.stem.org.uk/elibrary/list/21309/the-circle)
 |  |  |  |
| * + [Numerical solutions of equations](https://www.stem.org.uk/elibrary/list/21310/numerical-solutions-of-equations)
 |  |  |  |
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| STATISTICS |  |  |  |
| * + [Comparing statistical distributions](https://www.stem.org.uk/elibrary/list/14855/comparing-statistical-distributions)
 |  |  |  |
| * + [Relationships between two variables](https://www.stem.org.uk/elibrary/list/14856/relationships-between-two-variables)
 |  |  |  |
| * + [Representing data](https://www.stem.org.uk/elibrary/list/21743/representing-data)
 |  |  |  |
| * + [Using statistical measures](https://www.stem.org.uk/elibrary/list/22055/using-statistical-measures)
 |  |  |  |
| * + [Understanding cause and effect](https://www.stem.org.uk/elibrary/list/21894/understanding-cause-and-effect)
 |  |  |  |
| * + [Sampling](https://www.stem.org.uk/elibrary/list/21512/sampling)
 |  |  |  |
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| PROBABILITY |  |  |  |
| * + [Simple probability experiments](https://www.stem.org.uk/elibrary/list/14650/simple-probability-experiments)
 |  |  |  |
| * + [Probability: showing all possible outcomes](https://www.stem.org.uk/elibrary/list/14651/probability-showing-all-possible-outcomes)
 |  |  |  |
| * + [Theoretical probability](https://www.stem.org.uk/elibrary/list/14799/theoretical-probability)
 |  |  |  |
| * + [Conditional probability](https://www.stem.org.uk/elibrary/list/21511/conditional-probability)
 |  |  |  |
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| RATIO, PROPORTION AND RATES OF CHANGE |  |  |  |
| * + [Ratio and scale factors](https://www.stem.org.uk/elibrary/list/14795/ratio-and-scale-factors)
 |  |  |  |
| * + [Ratio: reducing to simplest form](https://www.stem.org.uk/elibrary/list/14796/ratio-reducing-to-simplest-form)
 |  |  |  |
| * + [Percentage change](https://www.stem.org.uk/elibrary/list/15825/percentage-change)
 |  |  |  |
| * + [Multiplicative reasoning](https://www.stem.org.uk/elibrary/list/14797/multiplicative-reasoning)
 |  |  |  |
| * + [Rates of change](https://www.stem.org.uk/elibrary/list/15826/rates-of-change)
 |  |  |  |
| * + [Proportion](https://www.stem.org.uk/elibrary/list/21317/proportion)
 |  |  |  |

A Similar Post-16 Mathematics subject audit will also be made available, electronically.

General Issues

Knowledge Grade 0 None or recalled from own experience as pupil/student

 1 Outline knowledge based on general reading or hearsay

 2 Detailed knowledge based on specialist reading/ recent school experience

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| **MATHEMATICS EDUCATION TOPIC** | **KNOWLEDGE****GRADE****(0 or 1 or 2)****Sep 2020** | **KNOWLEDGE****GRADE****(0 or 1 or 2)****July 2020** |
| National Curriculum for Mathematics KS2-4  |  |  |
| Regulations and Codes of Practice for GCSE Mathematics |  |  |
| GCSE syllabuses for Mathematics |  |  |
| Specifications for AS and A level Maths |  |  |
| Research findings re Maths performance |  |  |
| Research into effective Maths teaching |  |  |
| Research into common errors and misconceptions held by pupils |  |  |
| Published schemes and sources and text books |  |  |
| The use of IT in Mathematics teaching |  |  |
| Approaches to teaching Mathematics to low attaining pupils |  |  |
| Approaches to teaching Mathematics to very able pupils |  |  |
| Approaches to teaching Mathematics to EAL pupils |  |  |
| Ofsted data re Mathematics performance |  |  |
| The place of numeracy in Secondary Mathematics |  |  |
| Appropriate use of symbols and language in the Mathematics classroom |  |  |
| Methods of differentiation in Mathematics |  |  |
| The use of History of Mathematics and non-Eurocentric Mathematics |  |  |
| Government guidance on mathematics teaching and learning at KS2 |  |  |
| Mathematics Mastery and it implications for primary schools |  |  |
| Mathematics Mastery and it implications for primary schools |  |  |
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Have you completed any Open University, FutureLearn or OpenLearn Mathematics or Mathematics Education courses? (Details?)

Did you apply for a Teacher Training Scholarship (via the IMA?)

Have you attended any Mathematics teacher conferences or meetings (ATM/MA)?

Have you joined ATM? NCETM? NRICH? MA? MEI?

Additional relevant information (optional):