Mathematics Mastery

Year 7 Curriculum Map

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Solve word problems (add and subtract)	**Explain and investigate (multiply and divide)**	**Geometry**	**Fractions**	**Applications of algebra**	**Percentages and statistics**
Place value (including decimals) Add and subtract (including decimals) Rounding Perimeter Mental strategies	Factors and multiples Multiply and divide (including decimals) Area of rectangle, triangle and parallelogram Calculate the mean Further mental strategies	Draw and measure angles Find unknown angles (straight lines, at a point, vertically opposite) Properties of triangles and quadrilaterals Unit conversions (linear) Symmetry and tessellation	Equivalent fractions Compare and order fractions and decimals Change mixed numbers to improper fractions and vice versa Fraction of a quantity Multiply and divide fractions	Order of operations Substitution Form and simplify algebraic expressions Expand over a single bracket, and factorise Sequences (term-to-term, not nth term)	Construct and interpret statistical diagrams including pie charts Convert between percentages, vulgar fractions and decimals Percentage of a quantity Find the whole, given the part and the percentage

Example suggestions for depth:

Investigate how numbers are represented in different bases. Consider the advantages/disadvantages of addition and subtraction in these bases.	Explore and compare different multiplication methods: Vedic, Russian peasant, Egyptian, Napiers Bones etc.	Use geoboards to find different types of triangles with a given area. e.g. try to find obtuse-angled, right-angled and acute-angled triangles with an area of 8.	Show me an equivalent calculation to: $18 \div \frac{3}{5}$ which: - uses fractions - does not use fractions	Discuss the ambiguous sequence: 3, 7, 15, … What assumptions do we make? What is the least amount of information we need to define a sequence?	Kieran, Tyrell and Sian were sharing a pizza. Kieran's share was 80% the size of Tyrell's. Sian's share was 25% the size of Kieran. What percentage of the pizza did they each receive?

Mathematics Mastery

Year 8 Curriculum Map

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Number	**Algebraic expressions**	**Oa=geometry**	**Proportional reasoning**	**P-a=geometry**	**Statistics**
Primes and indices

Prime factorisation, squares and cubes

Use of Venn diagrams to find LCM and HCF

Add and subtract fractions | Order and calculate with negative numbers

Form and solve linear equations (unknowns on one side)

Use more complex algebraic expressions

Linear sequences: nth term | Construct triangles and quadrilaterals

Calculate unknown angles (including parallel lines)

Unit conversions (including area)

Area of a trapezium

Areas and perimeters of composite figures | Percentage increase and decrease, including multipliers

Reverse percentage problems

Ratio (equivalent, of a quantity) and rate

Scaling and multipliers

Speed, distance, time | Use of significant figures and estimation

Circumference and area of a circle

Visualise and identify 3-D shapes and their nets

Volume of cuboid, prism, cylinder, composite solids

Surface area | Collect and organise data, including surveys

Interpret and compare statistical representations

Mean, median and mode averages

The range and outliers |

■ Example suggestions for depth:

Find a multiple of 5 and a multiple of 6 that have a difference of 11, find a multiple of 7 and a multiple of 4 that add to make a total of 100.	How many squares (of all sizes) are there on a chessboard?

Investigate, recording the frequency of different sized squares. | Four rods, two of length a and two of length b are linked to form a kite.

The linkage is moveable so that the angles change. What is the maximum area of the kite? | Which is the better special offer?

20% extra free
or
15% off? | The areas of the faces of a cuboid are 3, 12 and 25 cm^2.

What is the volume of the box? | There are several sets of five positive whole numbers with the following properties: *mean = 4, median = 3, mode = 3*

Can you find all the different sets that satisfy these conditions? |

Mathematics Mastery

Year 9 Curriculum Map

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Graphs and proportion	**Algebraic expressions**	**Oa=geometry**	**Equations and inequalities**	**Geometry**	**Statistics**
Cartesian coordinates including midpoint of a line segment

Linear graphs

Direct and inverse proportion

Calculate with scales

Standard form | Sequences including arithmetic and geometric

Expand binomials and factorise simple quadratics

Change the subject of familiar formulae | Construction and loci

Congruence and similarity

Angles in polygons

Properties of shapes | Construct and solve equations and inequalities

Graphical solutions to simultaneous linear equations

Quadratic and other graphs | Pythagoras' theorem

Transformations (translation, rotation, reflection)

Use known angle and shape facts to obtain simple proofs

Probability | Mean of grouped data

Compare two data sets

Stem-and-leaf diagrams

Scatter graphs

Exploring trigonometry |

■ Example suggestions for depth:

Plot the lines

$y = 2x$
$y = -0.5x$

Add two more lines to make a square.

Write inequality statements for each of the four lines to describe the bounds of the square. | $12 = 3 + 4 + 5$

Can every integer be written as a sum of consecutive numbers?

Draw conclusions and explain them with convincing arguments. | Using only a ruler and a pair of compasses, construct a square inside any triangle so that one side of the square rests on one side of the triangle and the other two vertices of the square touch the other two sides of the triangle. | Water's freezing point is 0°C, 32°F and 273K and its boiling point is 100°C, 212°F and 373K.

Can you describe methods of converting between Celcius, Fahrenheit and Kelvin? | Which is a better fit, a square peg in a round hole or a round peg in a square hole? | The arithmetic mean of a and b is:
    $0.5(a + b)$
The geometric mean of a and b is:
    $\sqrt{ab}$
Investigate, for different values of a and b, when the two means are closest and when one is larger. |

Mathematics Mastery

Year 10 Curriculum Map

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Number	**Geometry**	**Reasoning**	**Geometry & number**	**Sampling & probability**	**Applications of algebra**
Calculations with and rules of indices Calculations with standard form Geometric change including compound interest, growth and decay Standard non-linear sequences	Enlargement Similar shapes Bearings Trigonometry in right angled triangles	Algebraic arguments Geometric reasoning Equations of parallel lines Vectors	Properties of 3-D shapes; their plans and elevations Exact surface area and volume of pyramids, cones and spheres Estimation and limits of accuracy Loci Geometric proof	Populations and samples Theoretical and experimental probability Probability of combined events, including tree diagrams and use of Venn diagrams Sample spaces and listing	Expand and factorise binomials Quadratic equations Cubic and reciprocal graphs Linear simultaneous equations Graphical solutions of equations

Example suggestions for depth:

Find the formula for the nth term of a quadratic sequence	Enlarge shapes from a given centre, using a combination of transformations, including negative integer and fractional scale factors	Use vector proofs and reasoning on two-dimensional shapes	Corinne's pencil tin is in the shape of a cuboid measuring 20 cm by 10 cm by 10 cm. Find the largest pencil length that would fit in her box.	Investigate conditional probability problems.	Explore quadratic inequalities. Plot the following inequalities graphically: $x^2 < 2x + 1$ $2x^2 > -x^2 + 4$ $x < x^2 < x + 10$

Year 11 Curriculum Map

Mathematics Mastery

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Algebra and geometry	Number & statistics	Revision extension 1	Revision extension 2	Revision extension 3	Examinations

Autumn 1 — Algebra and geometry

- Arcs and sectors of circles
- Direct and inverse variation
- Proof in algebra and geometry

Autumn 2 — Number & statistics

- Represent and describe distributions
- Identify misleading graphs
- Time series
- Correlation and lines of best fit
- Solve problems involving compound units

Spring 1 – Summer 1

Review and revision

Example suggestions for depth:

The equation of a circle of radius 2 centred at (3,4) is:

$$(x-3)^2 + (y-4)^2 = 4$$

A straight line with gradient −2 is tangent to the circle. At what two points could it meet the circle?

Given a data set, students should attempt to construct a cumulative frequency graph and explain its shape.