

# Year 8 Mathematics Mastery Programme of Study

## Autumn 1 ~ Working with number

Unit 1 – Primes and factorising (2 weeks)	<ul style="list-style-type: none"> <li>Find the factors and multiples of a number</li> <li>Find the prime factors of a number</li> <li>Determine HCF and LCM by prime factorisation</li> <li>Find squares, square roots, cubes and cube roots using prime factorisation</li> <li>Use indices to record repeated multiplication</li> </ul>	Y7 U5, U16
Unit 2– Add and subtract fraction (3)	<ul style="list-style-type: none"> <li>Use equivalent fractions</li> <li>Add and subtract fractions with like and unlike denominators</li> <li>Add and subtract fractions mixed numbers and improper fractions</li> <li>Convert between improper fractions and mixed numbers</li> <li>Add and subtract fractions mixed numbers and improper fractions</li> </ul>	Y7 U13, U14, U15

## Autumn 2 ~ number and algebra

Unit 3– Positive and negative numbers (2)	<ul style="list-style-type: none"> <li>Represent and order positive and negative integers on a number line (using the symbols <math>&gt;</math>, <math>\geq</math>, <math>&lt;</math>, and <math>\leq</math>)</li> <li>Show addition and subtraction on a number line</li> <li>Apply the four basic operations on positive and negative integers</li> <li>Calculate with rational and decimal numbers (including negative numbers)</li> </ul>	Y7 U16
Unit 4 – Sequences, expressions and equations (3)	<ul style="list-style-type: none"> <li>Recognise and represent number patterns (including finding an algebraic expression for the <math>n^{\text{th}}</math> term)</li> <li>Distinguish between terms and coefficients in algebraic expressions</li> <li>Distinguish between like and unlike terms in algebraic expressions</li> <li>Simplify expressions, collect like terms and expand and factorise linear expressions</li> <li>Substitute numerical values into formulae and expressions</li> <li>Solve linear equations in one unknown</li> <li>Solve simple fractional equations that can be reduced to linear equations</li> <li>Formulate a linear equation in one unknown to solve problems</li> </ul>	Y7 U16, U17 Y8 U3

## Spring 1 ~ 2D geometry

Unit 5 – Triangles, quadrilaterals and angles in parallel lines (3)	<ul style="list-style-type: none"> <li>Construct a triangle from given information (sides/angles)</li> <li>Classify special quadrilaterals on the basis of their properties: define a parallelogram, rhombus and trapezium</li> <li>Construct a quadrilaterals from given information (sides/angles)</li> <li>Identify the different types of angles formed by parallel lines and a transversal such as corresponding angles, alternate angles and interior angles</li> <li>Use the various properties of angles to find unknown angles</li> <li>Find unknown angles in geometrical figures involving square, rectangle, parallelogram, rhombus, trapezium and triangle</li> </ul>	Y7 U9, U10, U11
Unit 6 – Length and area: parallelograms and trapezia (2)	<ul style="list-style-type: none"> <li>Convert between <math>\text{cm}^2</math> and <math>\text{m}^2</math></li> <li>Find the area and perimeter of a figure made up of some of the following shapes: square, rectangle, triangle</li> <li>Find the areas of parallelograms and trapezia</li> <li>Find the areas and perimeters of composite plane figures</li> <li>Solve word problems involving area and perimeter</li> </ul>	Y7 U4, U7, U8, U10, U11

## Spring 2 ~ Proportional reasoning

Unit 7 – Percentage change (2)	<ul style="list-style-type: none"> <li>Use percentages greater than 100%</li> <li>Express one quantity as a percentage of another</li> <li>Compare two quantities by percentage</li> <li>Increase or decrease a quantity by a given percentage</li> <li>Understand how to compare quantities using percentages</li> <li>Reverse percentages: find the original quantity given a part of it and its percentage</li> <li>Reverse percentages: find the original quantity when we know its final value after the percentage increase or decrease</li> <li>Solve problems involving percentages and reverse percentages</li> </ul>	Y7 U19
Unit 8 – Ratio and rate (3)	<ul style="list-style-type: none"> <li>Interpret <math>a : b</math> and <math>a : b : c</math>, where <math>a</math>, <math>b</math> and <math>c</math> are whole numbers</li> <li>Compare two or more quantities by ratio</li> <li>Understand the relationship between ratios and fractions</li> <li>Write equivalent ratios, and find the missing term in a pair of equivalent ratios</li> <li>Express ratios involving rational numbers in their simplest form</li> <li>Divide a quantity in a given ratio</li> <li>Find the whole/ one part when a whole is divided into parts in a given ratio</li> <li>Solve word problems involving ratio</li> <li>Use the relationship between distance, time and speed</li> <li>Write speed in different units such as <math>\text{km/h}</math>, <math>\text{m/min}</math>, <math>\text{m/s}</math> and <math>\text{cm/s}</math></li> <li>Convert from one unit of speed to another (e.g. <math>\text{km/h}</math> to <math>\text{m/s}</math>)</li> <li>Solve word problems involving speed, uniform speed and average speed</li> </ul>	Y7 U13, U14, U15

## Summer 1 ~ 2D and 3D geometry

Unit 9 – Rounding (1)	<ul style="list-style-type: none"> <li>Round off a number to a required number of decimal places</li> <li>Round off a number to a required number of significant figures</li> <li>Estimate the answer to a given problem</li> <li>Identify rounding and truncation errors</li> </ul>	Y7 U1, U4
Unit 10 – Circumference and area of a circle (2)	<ul style="list-style-type: none"> <li>Use formulae to calculate the area and circumference of a circle</li> <li>Find the area and perimeter of                             <ul style="list-style-type: none"> <li>semicircle (half circle)</li> <li>quarter circle</li> </ul> </li> <li>Solve word problems involving area and perimeter</li> </ul>	
Unit 11 – 3D shapes and nets (1)	<ul style="list-style-type: none"> <li>Recognise nets of 3D shapes</li> <li>Build and name 3D shapes</li> <li>Draw plans and elevations of a given solid</li> <li>Identify a solid from its plans and elevations</li> </ul>	
Unit 12 – Surface area and volume (2)	<ul style="list-style-type: none"> <li>Find the volumes of cubes and cuboids</li> <li>Find the volumes of prisms and cylinders</li> <li>Find the volumes of composite solids</li> <li>Explore the surface area of cubes, cuboids, cylinders other prisms and composite solids</li> <li>Convert between <math>\text{cm}^3</math> and <math>\text{m}^3</math></li> </ul>	Y7 U6, U8 Y8 U6

## Summer 2 ~ handling data

Unit 13 – statistics (2)	<ul style="list-style-type: none"> <li>Find the mean, median more and range from raw datasets</li> <li>Use the mean/median/mode to compare data sets</li> <li>Use an average plus the range to compare datasets</li> <li>Find the mode, median and mean from tables and graphical representations (not grouped)</li> <li>Explore methods of data collection including surveys, questionnaires and the use of secondary data</li> <li>Appreciate the difference between discrete and continuous data</li> <li>Classify and tabulate data</li> <li>Conduct statistical investigations using collected data</li> <li>Draw, analyse and interpret graphs including those met in year 7</li> </ul>	Y7 U20
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