



Year 6

Mathematics Curriculum 2019 - 2020

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RATIONALE

This maths curriculum has been designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum. It has also has been designed to incorporate more time for the children to apply their skills, demonstrate deeper understanding of mathematics and to see mathematics in everything we do, both across the rest of the curriculum in school and in the wider world.

The core principles of this curriculum should help to not only develop confidence in mathematics but should also look to develop children in to mathematicians.

A mathematician...

- Makes connections
- Shows fluency (choosing and using efficient methods, as well as known facts)
- Is able to reason about what they are doing
- Creates
- Checks (in different ways)
- Is resilient
- Explains
- Evaluates
- Models
- Invents
- Applies in a range of contexts
- Is curious
- Has confidence
- Uses mistakes to improve
- Is resourceful
- Is efficient

Lessons are crafted with care and are often perfected over time with input from other teachers, drawing on evidence from observations of pupils in class.

Lesson designs are set out in detail and use well-tested methods to teach a given mathematical topic. They include a variety of representations, which are needed to introduce and explore a concept effectively and set out related teacher explanations and questions to pupils.

All lessons will contain a range of representations; variation; stem sentences; intelligent practice; coherence; fluency; differentiation; careful choices and the opportunity to dive deeper for all (Dong Nao Jin).



YEARLY PLAN

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11
Autumn	Number: Place Value		Number: Four Operations				Number: Fractions		Geometry: Position and Direction		Number: Fractions
Spring	Number: Decimals		Number: Percentages		Number: Algebra		Measurement: Converting Units		Measurement: Perimeter, Area and Volume		Number: Ratio
Summer	Geometry: Properties of Shape		Statistics		SATs	Application of Skills, Investigations, Presentations					

HEURISTICS TO FOCUS ON DURING THE YEAR:

- Draw Something
- Act it out
- Guess, check, improve
- Make a systematic list
- Work backwards
- Solve part of the problem
- Look for patterns
- Simplify the problem
- Make suppositions



LINKS TO MASTERY MATERIALS

[NCETM Teaching for Mastery](#)

[NCETM Mastery PD Materials](#)

[White Rose Materials For Units](#)

TERMLY PLANS

KEY FOR NRICH TASKS

Tasks badged with a * are suitable for the whole class	Tasks badged with a ** are suitable for the majority of the class	Tasks badged with a *** are for those who like a serious challenge
G = game	All NRICH tasks are categorised as problems.	I = investigation



AUTUMN

Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11
<p>Number: Place Value</p> <p>Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.</p> <p>Round any whole number to a required degree of accuracy.</p> <p>Use negative numbers in context, and calculate intervals across zero.</p> <p>NRICH: First Connect Three * G</p> <p>Solve number and practical problems that</p>	<p>Number: Four Operations</p> <p>Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.</p> <p>Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication.</p> <p>Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.</p> <p>Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context.</p>						<p>Number: Fractions</p> <p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</p> <p>Compare and order fractions, including fractions > 1</p> <p>NRICH: More Fraction Bars **</p> <p>NRICH: Extending Fraction Bars **</p> <p>Generate and describe linear number sequences (with fractions)</p> <p>Add and subtract fractions with different denominations and mixed numbers, using the</p>	<p>Geometry: Position and Direction</p> <p>Describe positions on the full coordinate grid (all four quadrants).</p> <p>NRICH: Cops and Robbers * G</p> <p>NRICH: Coordinate Tan **</p> <p>NRICH: Ten Hidden Squares ***</p> <p>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>	<p>Number: Fractions</p> <p>Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]</p> <p>Divide proper fractions by whole numbers [for example $\frac{1}{3} \div 2 = \frac{1}{6}$]</p> <p>Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example $\frac{3}{8}$]</p> <p>Recall and use equivalences between simple fractions, decimals and percentages,</p>	



<p>involve all of the above.</p> <p>NRICH: Round the Four Dice * I</p> <p>NRICH: Number Lines in Disguise **</p>	<p>Perform mental calculations, including with mixed operations and large numbers.</p> <p>NRICH: Become Maths Detectives * I</p> <p>NRICH: Exploring Number Patterns You Make ** I</p> <p>Identify common factors, common multiples and prime numbers.</p> <p>NRICH: The Moons of Vuvv *</p> <p>NRICH: Mystery Matrix ** I</p> <p>NRICH: Factor Lines ** I</p> <p>NRICH: Factor-multiple Chains **</p> <p>NRICH: Round and Round the Circle ** I</p> <p>NRICH: Counting Cogs **</p> <p>Use their knowledge of the order of operations to carry out calculations involving the four operations.</p> <p>Solve problems involving addition, subtraction,</p>	<p>concept of equivalent fractions.</p> <p>NRICH: Fraction Lengths **</p> <p>Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example $\frac{3}{8}$]</p> <p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p>		<p>including in different contexts.</p> <p>NRICH: Doughnut Percents *</p>
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	<p>multiplication and division.</p> <p>NRICH: Always, Sometimes or Never? Number *</p> <p>Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy.</p> <p>NRICH: Four Go * 6</p>			
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AUTUMN SMALL STEPS

Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11		
Number: Place Value <ul style="list-style-type: none"> Numbers to ten million Compare and order any number Round any numbers Negative numbers 		Number: Four Operations <ul style="list-style-type: none"> Add and subtract whole numbers Multiply up to a 4-digit by 2-digits Short division Division using factors Long division Common factors Common multiples Primes Squares and cubes Order of operations Mental calculations and estimation Reasoning from known facts 				Number: Fractions <ul style="list-style-type: none"> Simplify fractions Fractions on a number line Compare and order (denominator) Compare and order (numerator) Add and subtract fractions Adding fractions Subtracting fractions Mixed addition and subtraction 			Geometry: Position and Direction <ul style="list-style-type: none"> Coordinates in the first quadrant Coordinate in four quadrants Translations Reflections 		Number: Fractions <ul style="list-style-type: none"> Multiply fractions by integers Multiply fractions by fractions Divide fractions by integers Four rules with fractions Fraction of an amount Finding the whole 	



SPRING

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
<p>Number: Decimals</p> <p>Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places.</p> <p>Multiply one-digit numbers with up to 2 decimal places by whole numbers.</p> <p>Use written division methods in cases where the answer has up to 2 decimal places.</p> <p>Solve problems, which require answers to be</p>	<p>Number: Percentages</p> <p>Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison.</p> <p>NRICH: Would You Rather? *</p> <p>Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.</p>	<p>Number: Algebra</p> <p>Use simple formulae</p> <p>NRICH: Finding 3D Stacks ***</p> <p>NRICH: Doplication *</p> <p>NRICH: Diagonal Sums **</p> <p>Generate and describe linear number sequences.</p> <p>NRICH: Domino Sets * I</p> <p>NRICH: Break it Up! * I</p> <p>NRICH: Holes * I</p> <p>NRICH: Button-up Some More ** I</p> <p>Express missing number problems algebraically.</p>	<p>Measurement: Converting Units</p> <p>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p> <p>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3d.p.</p> <p>Convert between miles and kilometres.</p>	<p>Measurement: Perimeter, Area and Volume</p> <p>Recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>NRICH: Dicey Perimeter, Dicey Area * G</p> <p>Recognise when it is possible to use formulae for area and volume of shapes.</p> <p>Calculate the area of parallelograms</p>	<p>Number: Ratio</p> <p>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</p> <p>NRICH: Jumping *</p> <p>NRICH: Rectangle Tangle *</p> <p>NRICH: Orange Drink **</p> <p>NRICH: Pumpkin Pie Problem **</p> <p>NRICH: Fraction Fascination ***</p> <p>Solve problems involving similar shapes where the scale factor is known or</p>					



<p>rounded to specified degrees of accuracy.</p>		<p>NRICH: Plenty of Pens *</p> <p>NRICH: Two and Two ***</p> <p>I</p> <p>Find pairs of numbers that satisfy an equation with two unknowns.</p> <p>Enumerate possibilities of combinations of two variables.</p>		<p>and triangles.</p> <p>Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3, m^3 and extending to other units (mm^3, km^3)</p> <p>NRICH: Next Size Up **</p>	<p>can be found.</p> <p>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>
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SPRING SMALL STEPS

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	
Number: Decimals <ul style="list-style-type: none"> • Three decimal places • Multiply by 10, 100 and 1,000 • Divide by 10, 100 and 1,000 • Multiply decimals by integers • Divide decimals by integers • Division to solve problems • Decimals as fractions • Fractions to decimals 		Number: Percentages <ul style="list-style-type: none"> • Fractions to percentages • Equivalent F.D.P • Percentage of an amount • Percentages - missing values • Percentage increase and decrease • Order F.D.P 		Number: Algebra <ul style="list-style-type: none"> • Find a rule - one-step • Find a rule - two-step • Use an algebraic rule • Substitution • Formulae • Word problems • Solve simple one-step equations • Solve two-step equations • Find pairs of values • Enumerate possibilities 		Measurement: Converting Units <ul style="list-style-type: none"> • Metric units • Convert metric measures • Calculate with metric measures • Miles and kilometres • Imperial measures 		Measurement: Perimeter, Area and Volume <ul style="list-style-type: none"> • Shapes - same area • Area and perimeter • Area of a triangle • Area of a parallelogram • Volume - counting cubes • Volume of a cuboid 		Number: Ratio <ul style="list-style-type: none"> • Using ratio language • Ratio and fractions • Introducing the ratio symbol • Calculating ratio • Using scale factors • Calculating scale factors • Ratio and proportion problems 	



SUMMER

Week 1	Week 2	Week 3	Week 4
<p>Geometry: Properties of Shapes</p> <p>Draw 2-D shapes using given dimensions and angles.</p> <p>NRICH: Shape Draw *</p> <p>NRICH: Baravelle *</p> <p>NRICH: Making Spirals ***</p> <p>Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.</p> <p>NRICH: Where Are They? *</p> <p>NRICH: Round a Hexagon *</p> <p>NRICH: Always, Sometimes or Never? Shape *</p> <p>NRICH: Quadrilaterals *** I</p> <p>NRICH: Triangles All Around ***</p> <p>NRICH: Name That Triangle! *</p> <p>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p> <p>Recognise, describe and build 3D shapes, including making nets.</p> <p>NRICH: Cut Nets **</p> <p>NRICH: Making Cuboids ** I</p>		<p>Statistics</p> <p>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.</p> <p>Interpret and construct pie charts and line graphs and use these to solve problems.</p> <p>NRICH: Match the Matches **</p> <p>Calculate the mean as an average.</p> <p>NRICH: Birdwatch * I</p>	



Week 1	Week 2	Week 3	Week 4
<p>Geometry: Properties of Shapes</p> <ul style="list-style-type: none">• Measure with a protractor• Introduce angles• Calculate angles• Vertically opposite angles• Angles in a triangle• Angles in a triangle - special cases• Angles in a triangle - missing angles• Angles in special quadrilaterals• Angles in regular polygons• Draw shapes accurately• Nets of 3D shapes		<p>Statistics</p> <ul style="list-style-type: none">• Read and interpret line graphs• Draw line graphs• Use line graphs to solve problems• Circles• Read and interpret pie charts• Pie charts with percentages• Draw pie charts• The mean	



INVESTIGATIONS

NRich: [Collaborative Working](#)

NRich: [Being Resourceful](#)