

Autumn 1: A Victorian Education

Week	Unit	National Curriculum objectives Possible lesson objectives	White Rose Maths (WRM) ‘small steps’	Models and images representing number Key vocabulary	Reasoning (in addition to WRM questions)	Fluency
1	Warm-Up Week Times table revision					
2	Number Place value to 1 million					
	<ul style="list-style-type: none">• read and write numbers to at least 1 000 000 and determine the value of each digit• read Roman numerals to 1000 (M) and recognise years written in Roman numerals• solve number problems and practical problems <p>WAL Roman numerals to 1000, including D and M WALT represent numbers up to 10 000 WALT represent numbers up to 100 000 WALT represent numbers up to 1 million WALT read and write numbers up to 1 million</p>	<ul style="list-style-type: none">• Roman numerals to 1000• Numbers to 10 000• Numbers to 100 000• Numbers to 1 million• Read and write numbers to 1 million	Base-10, place value counters, place value grid, part-whole model, number line, counters, bar model <i>Million(s)</i> <i>Roman numerals to one million</i>	Give further examples Create six digit numbers where the digit sum is five and the thousands digit is two, e.g. 3002000. What are the largest and smallest numbers you can make? True or False? The number 1010101 has a 1 in the thousands place. In the number 1999999 the 9s are worth more than the 1. Make up your own questions like these. NRICH Roman Numerals	Arithmetic practice	
3	<ul style="list-style-type: none">• [for] numbers to at least 1 000 000 [...] determine the value of each digit• count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000• solve number problems and practical problems <p>WAL to identify and use powers of 10 WALT find a power of 10 more or less than any number WALT partition numbers to 1 million WALT partition numbers to 1 million in different ways WALT place numbers to 1 million on a number line</p>	<ul style="list-style-type: none">• Powers of 10• 10 / 100 / 1000 / 10 000 / 100 000 more or less• Partition numbers to 1 million• Number line to 1 million	Place value grid, Gattegno chart, counters, part-whole model, number track, place value counters, number line <i>Million(s)</i> <i>Roman numerals to one million, powers</i>	Spot the mistake: 177000,187000,197000,217000 What is wrong with this sequence of numbers? True or False? When I count in 10’s I will say the number 10100? Explain your answer. NRICH Space Distances	Arithmetic practice	

4	<ul style="list-style-type: none"> • order and compare numbers to at least 1 000 000 • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems <p>WALT compare numbers up to 100 000 WALT compare numbers up to 1 million WAP rounding to the nearest 10, 100 or 1000 WALT round numbers to 100 000 to any power of 10 WALT round numbers to 1 million to any power of 10</p>	<ul style="list-style-type: none"> • Compare and order numbers to 100 000 • Compare and order numbers to 1 million • Rounding to the nearest 10, 100 or 1000 • Round within 100 000 • Round within 1 million 	<p>Number line, place value grid, place value counters, counters</p> <p><i>Million(s)</i> <i>Roman numerals to one million</i></p>	<p>Do, then explain 747014 774014 747017 774077 744444 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers.</p> <p>Possible answers A number rounded to the nearest thousand is 76000 What is the largest possible number it could be?</p> <p>What do you notice? Round 44997 to the nearest 1000. Round it to the nearest 10000. What do you notice? Can you suggest other numbers like this?</p> <p>Top Tips What are your top tips for rounding?</p>	Arithmetic practice
5	<p>Number Calculation: Addition and subtraction</p>				
	<ul style="list-style-type: none"> • add and subtract whole numbers with more than 4 digits, including using formal written methods • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy <p>WALT choose and use different strategies for mental addition and subtraction WALT use the column method to add any whole numbers WALT use the column method to subtract any whole numbers WALT use rounding and estimating to check our answers WAP column methods for addition and subtraction</p>	<ul style="list-style-type: none"> • Mental strategies • Add whole numbers with more than 4 digits • Subtract whole numbers with more than 4 digits • Round to check answers 	<p>Place value grid, counters, number line, place value counters, column layout</p> <p><i>associative</i></p>	<p>Convince me <div style="display: inline-block; width: 40px; height: 15px; background-color: #4f81bd; border: 1px solid black;"></div> + 1475 = 6 <div style="display: inline-block; width: 20px; height: 15px; background-color: #4f81bd; border: 1px solid black;"></div> 24 What numbers/digits go in the boxes? What different answers are there? Convince me</p> <p>NRICH Reach 100 NRICH Subtraction Surprise</p>	Arithmetic practice

6	<ul style="list-style-type: none"> • add and subtract whole numbers with more than 4 digits, including using formal written methods • add and subtract numbers mentally with increasingly large numbers • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why <p>WALT use the inverse operation to check our calculations WALT solve addition and subtraction problems with more than one step WAP solving multi-step addition and subtraction problems</p>	<ul style="list-style-type: none"> • Inverse operations (addition and subtraction) • Multi-step addition and subtraction problems • Compare calculations • Find missing numbers 	<p>Column layout, number line, bar model</p> <p><i>associative</i></p>	<p>Hard and easy questions Which questions are easy / hard? $213323 - 70 =$ $512893 + 300 =$ $819354 - 500 =$ $319954 + 100 =$ Explain why you think the hard questions are hard Visualise it Draw a bar model that could be used for a 2-step word problem. Then write a problem to fit! The answer is... ...123 456 What's the (interesting) question?</p>	Arithmetic practice
7	<p>Number Calculation: Multiplication and division (I)</p>				
	<ul style="list-style-type: none"> • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers <p>WALT identify and use multiples WALT find common multiples WALT identify and use factors WALT find common factors WALT reason about multiples and factors</p>	<ul style="list-style-type: none"> • Multiples • Common multiples • Factors • Common factors 	<p>Array, counters, 100 square</p> <p><i>Common multiples, common factors</i></p>	<p>NRICH Sweets in a Box NRICH Abundant Numbers NRICH Flashing Lights NRICH Multiplication Squares NRICH Factors and Multiples Game NRICH Factor Track</p>	Arithmetic practice
8	<ul style="list-style-type: none"> • establish whether a number up to 100 is prime and recall prime numbers up to 19 • know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers <p>WALT identify prime and composite numbers WALT reason about prime numbers WALT calculate square numbers WALT calculate cube numbers WAP recall of prime, square and cube numbers</p>	<ul style="list-style-type: none"> • Prime numbers • Square numbers • Cube numbers 	<p>Array, counters, cubes, column layout</p> <p><i>Powers, prime</i></p>	<p>NRICH Two Primes Make One Square NRICH One Wasn't Square NRICH Cycling Squares NRICH Square Subtraction or NRICH Odd Squares</p>	Arithmetic practice

Autumn 2: What Price Progress?

Week	Unit	National Curriculum objectives Possible lesson objectives	White Rose Maths (WRM) 'small steps'	Models and images representing number Key vocabulary	Reasoning (in addition to WRM questions)	Fluency
1	Number Calculation: Multiplication and division (2)	<ul style="list-style-type: none"> multiply and divide numbers mentally drawing upon known facts multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 <p>WAP multiplying by 10 and 100 WALT multiply by 1000 WAP dividing by 10 and 100 WALT divide by 1000 WALT identify any multiple of 10, 100 or 1000</p>	<ul style="list-style-type: none"> Multiply by 10, 100 and 1000 Divide by 10, 100 and 1000 Multiples of 10, 100 and 1000 	<p>Place value grid, counters, Gattegno chart</p> <p><i>associative</i></p>	<p>Making links $7 \times 8 = 56$ How can you use this fact to solve these calculations? $0.7 \times 0.8 =$ $5.6 \div 8 =$</p> <p>Always, Sometimes, Never When you divide by 1000, you end up with a decimal number</p> <p>Prove it Dividing by 1000 is the same as dividing by 10, three times.</p>	Arithmetic practice
2	Number Fractions (1)	<ul style="list-style-type: none"> identify, name and write equivalent fractions of a given fraction, represented visually recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$] <p>WAP finding fractions equivalent to unit fractions WAP finding fractions equivalent to non-unit fractions WALT use numerical methods to find equivalent fractions WALT use the bar model for fractions greater than 1 WALT convert improper fractions to mixed numbers</p>	<ul style="list-style-type: none"> Find fractions equivalent to a unit fraction Find fractions equivalent to a non-unit fraction Recognise equivalent fractions Convert improper fractions to mixed numbers 	<p>Cuisenaire rods, Numicon, bar model, paper strips, cubes, part-whole model</p> <p><i>Mixed numbers</i> <i>Thousandths</i></p>	<p>Odd one out. Which is the odd one out in each of these collections of 4 fractions, and why? $6/10$ $3/5$ $18/20$ $9/15$ $30/100$ $3/10$ $6/20$ $3/9$</p> <p>Top tips What are your top tips for identifying equivalent fractions?</p> <p>NRICH Tumbling Down</p>	Arithmetic practice
3		<ul style="list-style-type: none"> recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$] compare and order fractions whose denominators are all multiples of the same number <p>WALT convert mixed numbers to improper fractions</p>	<ul style="list-style-type: none"> Convert mixed numbers to improper fractions Compare fractions less than 1 Order fractions less than 1 	<p>Cubes, bar model, counting stick, number line</p> <p><i>Mixed numbers</i> <i>Thousandths</i></p>	<p>Do, then explain Can you improve the way this number sequence is written? $1 \frac{1}{6}$ $1 \frac{1}{3}$ $1 \frac{3}{6}$ $1 \frac{4}{6}$ $1 \frac{5}{6}$, $12/6$ $2/16$ $7/3$ $2\frac{1}{2}$ Explain what you've done.</p> <p>Always, sometimes, never Improper fractions have a numerator greater than the denominator Improper fractions have a numerator greater than 2</p>	Arithmetic practice

	<p>WALT find common denominators and common numerators to compare fractions</p> <p>WALT compare proper fractions</p> <p>WALT order proper fractions</p> <p>WALT compare and order improper fractions and mixed numbers</p>	<ul style="list-style-type: none"> • Compare and order fractions greater than 1 		<p>Top tips</p> <p>Tell me how to change an improper fraction into a mixed number.</p> <p>Give an example</p> <p>...of a fraction that is more than three quarters but less than one whole. Now another example that no one else will think of. Explain how you know.</p>	
4	<ul style="list-style-type: none"> • add and subtract fractions with the same denominator and denominators that are multiples of the same number <p>WALT add and subtract fractions with the same denominator</p> <p>WALT add fractions within 1</p> <p>WALT add fractions to make more than 1</p> <p>WALT add fractions to a mixed number</p> <p>WALT add two mixed numbers</p>	<ul style="list-style-type: none"> • Add and subtract fractions with the same denominator • Add fractions within 1 • Add fractions with a total greater than 1 • Add to a mixed number • Add two mixed numbers 	<p>Bar model, cubes</p> <p><i>Mixed numbers</i></p> <p><i>Thousands</i></p>	<p>Do, then explain</p> <p>Imran put these fractions in order starting with the smallest. Are they in the correct order?</p> <p>Two fifths, three tenths, four twentieths</p> <p>How do you know?</p> <p>NRICH Linked Chains</p> <p>NRICH A4 Fraction Addition</p>	Arithmetic practice
5	<ul style="list-style-type: none"> • add and subtract fractions with the same denominator and denominators that are multiples of the same number <p>WALT subtract fractions</p> <p>WALT subtract from a mixed number without breaking a whole</p> <p>WALT break a whole when subtracting from a mixed number</p> <p>WALT subtract two mixed numbers</p> <p>WAP fraction skills: equivalence, converting, comparing, ordering, adding and subtracting</p>	<ul style="list-style-type: none"> • Subtract fractions • Subtract from a mixed number • Subtract from a mixed number – breaking the whole • Subtract two mixed numbers 	<p>Bar model, fraction diagrams, number line</p> <p><i>Mixed numbers</i></p> <p><i>Thousands</i></p>	<p>What do you notice?</p> <p>$\frac{3}{4}$ and $\frac{1}{4} = \frac{4}{4} = 1$</p> <p>$\frac{4}{4}$ and $\frac{1}{4} = \frac{5}{4} = 1 \frac{1}{4}$</p> <p>$\frac{5}{4}$ and $\frac{1}{4} = \frac{6}{4} = 1 \frac{1}{2}$</p> <p>Continue the pattern up to the total of 2.</p> <p>Can you make up a similar pattern for subtraction?</p> <p>The answer is... $4\frac{3}{4}$</p> <p>What's the question?</p> <p>Can you think of a question that no-one else will have thought of?</p> <p>NRICH A4 Fraction Subtraction</p>	Arithmetic practice
6 and 7	<p>Warm-down weeks</p> <p>Consolidation of material covered earlier in the term</p>				Division within times tables



Spring 1: Our Place in Space

Week	Unit	National Curriculum objectives Possible lesson objectives	White Rose Maths (WRM) 'small steps'	Models and images representing number Key vocabulary	Reasoning (in addition to WRM questions)	Fluency
	Number Calculation: Multiplication and division (2)					
1		<ul style="list-style-type: none"> multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers multiply numbers mentally drawing upon known facts <p>WALT use concrete resources for column multiplication with thousands WALT use Dienes for the area model of multiplication WALT use the area model to multiply WALT use the long multiplication method WALT compare the long multiplication method and the area model [not WRM]</p>	<ul style="list-style-type: none"> Multiply 4-digits by 1-digit Multiply 2-digits by 2-digits 	Place value counters, place value grid, column layout, base-10, area model [grid method] Associative	Use a fact To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve 48×25 78×25 4.6×25 What's the same, what's different? The area model and long multiplication. NRICH Trebling NRICH All the Digits NRICH Compare the Calculations (for multiplication) NRICH Picture Your Method	Arithmetic practice
2		<ul style="list-style-type: none"> multiply numbers up to 4 digits by a two-digit number using a formal written method, including long multiplication divide numbers mentally drawing upon known facts <p>WALT use the grid method and the area model to multiply 3-digit numbers WALT use the grid method and the area model to multiply 4-digit numbers WAP using sharing to divide, without exchanging WAP using sharing to divide, with exchanging WAP using sharing to divide, with remainders</p>	<ul style="list-style-type: none"> Multiply 3-digits by 2-digits Multiply 4-digits by 2-digits Solve problems with multiplication Short Division 	Column layout, area mode Place value counters, place value grid, part-whole model, counters Associative	Always, sometimes, never Multiplying a 3-digit number by a 1-digit number is easier than dividing a 3-digit number by a 1-digit number. Convince me of your answer. Size of an answer The product of a two digit and three digit number is approximately 6500. What could the numbers be? Prove It What goes in each missing box? $12 \square 2 \div 6 = 212$ $14 \square 4 \div 7 = 212$ $22 \square 3 \div 7 = 321 \text{ r } 6$ $323 \times \square 1 = 13243$ Prove it. NRICH Compare the Calculations (for division)	Arithmetic practice
3		<ul style="list-style-type: none"> divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context <p>WALT divide by partitioning and grouping – no exchanging</p>	<ul style="list-style-type: none"> Divide 4-digits by 1-digit Divide with remainders Efficient division Solve problems with multiplication and division 	Place value counters, place value grid, column layout	Making links Apples weigh about 170 g each. How many apples would you expect to get in a 2 kg bag? Prove It What goes in the missing box? $12 _ 2 \div 6 = 212$ $14 _ 4 \div 7 = 212$	Arithmetic practice

	WALT divide by partitioning and grouping – with exchanging WALT divide with remainders WALT understand remainders in context WAP short division (<i>not</i> WRM)			22__3 ÷ 7 = 321 r 6 323 × 1 = 13243 NRICH Division Rules NRICH Four Goodness Sake NRICH Highest and Lowest NRICH Make 100	
4	Number Fractions (I)				
	<ul style="list-style-type: none"> multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams <p>WALT multiply unit fractions WALT multiply non-unit fractions WALT multiply mixed numbers</p>	<ul style="list-style-type: none"> Multiply unit fractions by an integer Multiply non-unit fractions by an integer Multiply a mixed number by an integer 	Bar model, fraction diagram, number line <i>Mixed number</i> <i>Thousandths</i>	Continue the pattern $\frac{1}{4} \times 3 =$ $\frac{1}{4} \times 4 =$ $\frac{1}{4} \times 5 =$ Continue the pattern for five more number sentences. How many steps will it take to get to 3? The answer is... $2 \frac{1}{4}$ What is the question? Top tips Give your top tips for multiplying fractions.	Arithmetic practice
5	<ul style="list-style-type: none"> multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number (Y4) <p>WAP using pictorial and numerical methods to find fractions of quantities WALT calculate fractions of an amount WAL how a fraction can be used as an operator WAP using fractions as operators</p>	<ul style="list-style-type: none"> Calculate fractions of a quantity Fraction of an amount Find the whole Using fractions as operators 	Bar model	The answer is ... $1 \frac{2}{5}$ What is the question? Working backwards $\frac{5}{3}$ of 24 = 40 Write a similar sentence where the answer is 56. Odd one out Which is the odd one out, and why? $\frac{3}{4}$ of 48 $\frac{1}{2} \times 72$ $\frac{4}{5}$ of 50 $\frac{2}{3}$ of 54 Can you change the odd one out to make it fit? Make up your own 'odd one out' list like this one.	Arithmetic practice
6	Number Decimals and Percentages				
	<ul style="list-style-type: none"> identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents 	<ul style="list-style-type: none"> Decimals up to 2 d.p. Equivalent fractions and decimals (tenths) Equivalent fractions and decimals (hundredths) 	Place value grid, place value counters, part-whole model, blank 100 square grid, bead string, number line, base-10 <i>Thousandths</i>	Always, sometimes, never A digit in the thousandths place is worth less than a digit in the hundredths place. A number with thousandths is smaller than a number which only has hundredths. Use examples to prove that your answer is correct. Spot the mistake	Arithmetic practice

	<ul style="list-style-type: none"> • read and write numbers with up to three decimal places • solve problems involving number up to three decimal places <p>WAL the value of each digit in a number with 2 decimal places</p> <p>WALT convert between fractions and numbers with 2 decimal places</p> <p>WALT convert between fractions and more complex decimal numbers</p>	<ul style="list-style-type: none"> • Equivalent fractions and decimals 		<p>One of these equations is incorrect. Which one, and can you correct it?</p> <p>$0.303 = 3 \text{ tenths and } 3 \text{ thousandths}$</p> <p>$0.303 = \text{no hundredths and } 3 \text{ thousandths}$</p> <p>$0.303 = 303 \text{ thousandths}$</p>	
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Spring 2: Highgate N6

Week	Unit	National Curriculum objectives Possible lesson objectives	White Rose Maths (WRM) 'small steps'	Models and images representing number Key vocabulary	Reasoning (in addition to WRM questions)	Fluency
1	Decimals and Percentages	<ul style="list-style-type: none"> recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents read, write, order and compare numbers with up to three decimal places solve problems involving number up to three decimal places <p>WAP rounding decimals to the nearest whole number WAP rounding decimals to the nearest tenth WALT compare and order numbers with matching decimal places WALT compare and order numbers with unmatched decimal places</p>	<ul style="list-style-type: none"> Thousandths as fractions Thousandths as decimals Thousandths on a place value chart Order and compare decimals (same number of decimal places) 	<p>Place value counters, 10-frame, number line, place value grid</p> <p>thousandths, proportion</p>	<p>Missing symbol</p> <p> Put the correct symbol < or > in each box</p> <p> 4.627 4.06</p> <p>12.317 12.31</p> <p>Explain how you know.</p> <p>What do you notice?</p> <p>$0.085 + 0.015 = 0.1$ $0.075 + 0.025 = 0.1$ $0.065 + 0.035 = 0.1$</p> <p>Continue the pattern for the next five number sentences.</p>	Arithmetic Practice
2		<ul style="list-style-type: none"> solve problems involving number up to three decimal places Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per 100", and write percentages as a fraction with denominator 100, and as a decimal fraction Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 <p>WALT order and compare any decimals with up to 3 decimal places WALT round to the nearest whole number WALT round to 1 decimal place WALT understand percentages</p>	<ul style="list-style-type: none"> Order and compare any decimals with up to 3 decimal places Round to the nearest whole number Round to 1 decimal place Understand percentages 	<p>Place value counters, 10-frame, number line, place value grid</p> <p>thousandths, proportion, percent, percentages</p>	<p>Top tips</p> <p>Explain how to round decimal numbers to one decimal place.</p> <p>Do, then explain</p> <p>Circle each decimal which when rounded to one decimal place is 6.2.</p> <p>6.32 6.23 6.27 6.17</p> <p>Explain your reasoning.</p> <p>NRICH Round the Dice Decimals 2</p>	Arithmetic Practice
3		<ul style="list-style-type: none"> Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per 100", and write percentages as a fraction with denominator 100, and as a decimal fraction 	<ul style="list-style-type: none"> Percentages as fractions Percentages as decimals 	<p>Place value counters, 10-frame, number line, place value grid</p>	<p>Ordering</p> <p>Put these numbers in the correct order, starting with the largest. $\frac{7}{10}$, 0.73, $\frac{7}{100}$, 0.073 71%</p>	Arithmetic Practice

	<ul style="list-style-type: none">• Solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25 <p>WALT recognise percentages as fractions WALT recognise percentages as decimals WALT find equivalent fractions, decimals and percentages</p>	<ul style="list-style-type: none">• Equivalent fractions, decimals and percentages	percent, percentages	Another and another Write a fraction with a denominator of one hundred which has a value of more than 0.75? ... and another, ... and another, ...				
4	Perimeter and Area <ul style="list-style-type: none">• measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres <p>WALT use a ruler to accurately measure perimeter WALT to use a grid to find perimeter WALT find the perimeter of a rectangle WALT find the perimeter of a rectilinear shape WALT use a formula to calculate perimeter</p>	<ul style="list-style-type: none">• Perimeter of rectangles• Perimeter of rectilinear shapes• Perimeter of polygons	Ruler	Other possibilities A rectangular field has a perimeter between 14 and 20 metres. What could its dimensions be? Testing conditions Shape A is a rectangle that is 4m long and 3m wide. Shape B is a square with sides 3m. The rectangles and squares are put together side by side to make a path which has perimeter between 20 and 30 m. For example <table border="1"><tr><td></td><td></td><td></td></tr></table> Can you draw some other arrangements where the perimeter is between 20 and 30 metres? Do, then Explain When you join 2 equal size squares, side-by-side, to make a larger rectangle, what do you notice about the perimeter of the new shape compared to the perimeter of the starting squares? Explain why this happens. Experiment with joining other rectangles together – does the same thing happen?				Arithmetic Practice
5	<ul style="list-style-type: none">• calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes <p>WALT use a formula to calculate the area of a rectangle WALT find the area of compound rectilinear shapes WALT estimate the area of irregular shapes</p>	<ul style="list-style-type: none">• Area of rectangles• Area of compound shapes• Estimate area	Arrays cm2, cm3, m2, m3	Top Tips Put these amounts in order starting with the largest. 130000cm2 1.2 m2 13 m2 Explain your thinking What's the Same, What's Different? A 4 x 5 array and the area of a rectangle with sides of 4 cm and 5 cm.	Arithmetic Practice			

				NRICH Numerically Equal → NRICH Can They Be Equal NRICH Ribbon Squares NRICH Through the Window	
6	Statistics				
	<ul style="list-style-type: none"> • solve comparison, sum and difference problems using information presented in a line graph • Complete, read and interpret information in tables, including timetables <p>WALT read and interpret line graphs WALT draw line graphs WALT gather data to answer a questions WALT construct a line graph to present data WALT interpret a line graph to answer our question</p>	<ul style="list-style-type: none"> • Draw line graphs • Read and interpret line graphs • Read and interpret tables • Two-way tables • Read and interpret timetables 	<p>Tables, line graphs</p> <p><i>Interpret, data, categories, scale</i></p>	<p>Can and cannot</p> <p>Write down some questions that this graph <u>can</u> be used to answer; now write down some that it <u>cannot</u> and explain why not</p>	<p>Arithmetic Practice</p>

Summer 1: Benin – An African Kingdom


Week	Unit	National Curriculum objectives Possible lesson objectives	White Rose Maths (WRM) 'small steps'	Models and images representing number Key vocabulary	Reasoning (in addition to WRM questions)	Fluency
1	Shape	<ul style="list-style-type: none"> know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees ($^{\circ}$) <p>WAP recognising and comparing acute, obtuse and right angles WALT describe angles in degrees and in fractions of a whole turn WALT use a protractor WAP using a protractor accurately WALT use a protractor and ruler to draw accurately</p>	<ul style="list-style-type: none"> Understand and use degrees Classify angles Estimate angles Measuring angles up to 180 degrees Draw lines and angles accurately 	<p>Part-whole model, bar model</p> <p><i>Orientation degree(s), right angle, acute, obtuse, reflex, parallel, diagonal, perpendicular, vertical, point, 180 degrees, 360 degrees</i></p>	<p>NRICH How Safe are You? NRICH Six Places to Visit NRICH Olympic Turns (homework activity?) NRICH Estimating Angles (online)</p> <p>Convince me What is the angle between the hands of a clock at four o'clock? At what other times is the angle between the hands the same? Convince me.</p>	Arithmetic Practice
2		<ul style="list-style-type: none"> identify: angles at a point and one whole turn (total 360°); angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°); other multiples of 90° <p>WALT reason about angles on a straight line WALT reason about angles around a point WAP drawing triangles and classifying them by their properties WAP drawing quadrilaterals and classifying them by their properties</p>	<ul style="list-style-type: none"> Calculating angles around a point Calculating angles on a straight line Calculating lengths and angles in shapes Regular and irregular polygons 3-D shapes 	<p>Part-whole model, bar model</p> <p><i>Quadrilateral, polygon, polyhedron, polyhedral, orientation degree(s), right angle, acute, obtuse, reflex, parallel, diagonal, perpendicular, vertical, point, 180 degrees, 360 degrees</i></p>	<p>What's the same, what's different? The net of a cube and the net of a [non-cube] cuboid.</p> <p>Visualising I look at a large cube which is made up of smaller cubes. </p> <p>If the larger cube is made up of between 50 and 200 smaller cubes what might it look like? NRICH Guess What? NRICH Egyptian Rope</p>	Arithmetic Practice
3	Geometry Position and direction	<ul style="list-style-type: none"> identify, describe and represent the position of a shape following a translation, using the appropriate language, and know that the shape has not changed 	<ul style="list-style-type: none"> Read and plot coordinates Problem solving with coordinates Translation 	<p><i>x-axis, y-axis, translate, translation</i></p>	<p>True or false? A point with coordinates (3,3) can only be moved down or to the left a maximum of 3 grid squares. Explain your reasoning. Working backwards</p>	Arithmetic Practice


	<p>WAP plotting coordinates in the first quadrant</p> <p>WAP drawing shapes on a grid</p> <p>WAL how a coordinate describes movement from the origin</p> <p>WALT translate shapes on a grid</p> <p>WALT use coordinates to describe translations</p>	<ul style="list-style-type: none"> • Translation with coordinates 		<p>A square is translated 3 squares down and one square to the right. Three of the coordinates of the translated square are:</p> <p>(3, 6) (8, 11) (8, 6)</p> <p>What are the co-ordinates of the original square?</p> <p>NRICH Treasure Hunt (Level 1 – online resource)</p>	
4	<ul style="list-style-type: none"> • identify, describe and represent the position of a shape following a reflection, using the appropriate language, and know that the shape has not changed <p>WAP drawing lines of symmetry</p> <p>WAP completing symmetric figures</p> <p>WALT reflect shapes which do not touch the mirror line</p> <p>WALT use coordinates to describe and draw reflections</p> <p>WAP creating reflected patterns (<i>not WRM</i>)</p>	<ul style="list-style-type: none"> • Lines of symmetry • Reflection with coordinates 	Symmetry, reflection	<p>Always, sometimes, never</p> <p>The number of lines of reflective symmetry in a regular polygon is equal to the number of its sides n.</p> <p>Do, then explain</p> <p>Draw a simple shape on a coordinate grid, then draw a horizontal mirror line above or below it. Use the coordinates to reflect the shape about the mirror line. Explain how you did it, then repeat for a vertical mirror line.</p>	Arithmetic Practice
5	<p>Number Decimals (2)</p>				
	<ul style="list-style-type: none"> • solve problems involving number up to three decimal places • practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, $0.83 + 0.17 = 1$) [non-statutory] <p>WALT add decimals using concrete resources and column addition</p> <p>WALT subtract decimals by taking away</p> <p>WALT subtract decimals by finding a difference</p> <p>WALT find pairs of decimals which add to one</p> <p>WALT partition to add decimals</p>	<ul style="list-style-type: none"> • Use known facts to add and subtract decimals within 1 • Complements to 1 • Add and subtract decimals across 1 • Add decimals with the same number of decimal places 	Place value grid, place value counters, fraction diagram, column layout, part-whole model	<p>Odd one out</p> <p>Which is the odd one out?</p> <p>$0.67 + 0.33$</p> <p>$1 - 0.33$</p> <p>$0.67 - 0.33$</p> <p>Explain your answer. Is there more than 1 possible answer?</p> <p>Making links</p> <p>How might this calculation:</p> <p>$307 + 68$</p> <p>help with this:</p> <p>$3.07 + 0.68$?</p> <p>Would it help with:</p> <p>$3.07 + 6.8$?</p> <p>Why/why not?</p> <p>Working backwards</p> <p>I added 5 tenths, 7 hundredths and 4 thousandths to my number. I ended up with 4.333.</p> <p>What was my original number?</p>	Arithmetic Practice

6	<ul style="list-style-type: none">• solve problems involving number up to three decimal places• practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, $0.83 + 0.17 = 1$) [non-statutory] <p>WALT use place value grids and column layout to add decimals</p> <p>WALT use place value grids and column layout to subtract decimals</p> <p>WALT add decimals with a different number of decimal places</p> <p>WALT subtract decimals with a different number of decimal places</p> <p>WALT add decimals to, and subtract them from, whole numbers</p>	<ul style="list-style-type: none">• Subtracting decimals with the same number of decimal places• Adding decimals with different number of decimal places• Subtracting decimals with a different number of decimal places• Efficient strategies for adding and subtracting decimals	Place value grids, place value counters, column layout, bar model	<p>Do, then explain</p> <p>Calculate $1.001 - 0.11$ then explain your method.</p> <p>Compare calculations</p> <p>Which of these do you find hardest?</p> <p>$2.707 + 0.09$</p> <p>$0.555 + 3.444$</p> <p>$1.098 + 9.103$</p> <p>Explain why.</p> <p>Always, sometimes, never</p> <p>Adding tenths to a number would make it bigger than adding thousandths to it would.</p>	Arithmetic Practice								
7	<ul style="list-style-type: none">• multiply and divide whole numbers and those involving decimals by 10, 100 and 1000• solve problems involving number up to three decimal places <p>WALT continue and create sequences with decimals</p> <p>WALT multiply decimals by 10, 100 and 1000</p> <p>WALT divide by 10, 100 and 1000 with decimal answers</p> <p>WAP calculating with decimals (<i>not WRM</i>)</p>	<ul style="list-style-type: none">• Decimal sequences• Multiplying decimals by 10, 100 and 1000• Dividing decimals by 10, 100 and 1000• Multiply and divide decimals – missing values	Place value grid, counters, Gattegno chart	<p>Spot the mistake</p> <p>0.088, 0.089, 1.0</p> <p>What comes next?</p> <p>1.173, 1.183, 1.193</p> <p>Complete the pattern</p> <table><tr><td>$\frac{71}{100}$</td><td>$\frac{??}{100}$</td><td>$\frac{??}{100}$</td><td>$\frac{??}{100}$</td></tr><tr><td>0.71</td><td>0.81</td><td>???</td><td>???</td></tr></table> <p>Complete the table.</p> <p>Undoing</p> <p>I divide a number by 100 and the answer is 0.33 What number did I start with?</p> <p>Another and another</p> <p>Write down a number with two decimal places which when multiplied by 100 gives an answer between 33 and 38.</p> <p>... and another, ... and another</p>	$\frac{71}{100}$	$\frac{??}{100}$	$\frac{??}{100}$	$\frac{??}{100}$	0.71	0.81	???	???	Arithmetic Practice
$\frac{71}{100}$	$\frac{??}{100}$	$\frac{??}{100}$	$\frac{??}{100}$										
0.71	0.81	???	???										

Summer 2: A Village School

Week	Unit	National Curriculum objectives Possible lesson objectives	White Rose Maths (WRM) 'small steps'	Models and images representing number Key vocabulary	Reasoning (in addition to WRM questions)	Fluency															
1	NEGATIVE NUMBERS																				
	<ul style="list-style-type: none">Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero WALT understand negative numbers WALT count through zero in 1s WALT count through zero in multiples	<ul style="list-style-type: none">Understand negative numbersCount through zero in 1sCount through zero in multiples	Thermometers Number lines	Captain Conjecture says, 'If you keep subtracting 3 from 397 you will eventually reach -3.' Do you agree? Explain your reasoning. NRICH Swimming Pool NRICH Tug Harder! NRICH Sea Level	Arithmetic practice																
2	<ul style="list-style-type: none">Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero WALT compare and order negative numbers WALT find the difference between numbers	<ul style="list-style-type: none">Compare and order negative numbersFind the difference	Thermometers Number lines	<p>The temperature at 6 a.m. was recorded each day for one week.</p> <table><tr><td>Day</td><td>Mon</td><td>Tues</td><td>Wed</td><td>Thurs</td><td>Fri</td><td>Sat</td><td>Sun</td></tr><tr><td>Temp (°C)</td><td>1</td><td>-1</td><td>0</td><td>3</td><td>2</td><td>-2</td><td>-3</td></tr></table> <p>What was the coldest morning? What was the warmest morning? What is the difference in temperature between Monday and Tuesday? Place the recorded temperatures in order from smallest to largest.</p> <p>What is the difference in temperature between the coldest day and the warmest day? At what time of year do you think these temperatures were recorded? Do you think it might have snowed during the week?</p> NRICH Swimming Pool NRICH Tug Harder! NRICH Sea Level	Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Temp (°C)	1	-1	0	3	2	-2	-3	Arithmetic practice
Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun														
Temp (°C)	1	-1	0	3	2	-2	-3														

3	Measurement Converting units				
	<ul style="list-style-type: none">convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling WAP converting between metres and kilometres WALT convert between grams and kilograms WALT convert between metres and millimetres WALT convert between litres and millilitres WALT choose appropriate metric units and convert between them	<ul style="list-style-type: none">Kilograms and kilometresMillimetres and millilitresConvert units of length	Bar model, ruler, metre stick, other measuring scales Introduce Double number line	Write more statements Mr Smith needs to fill buckets of water. A large bucket holds 6 litres and a small bucket holds 4 litres. If a jug holds 250 ml and a bottle holds 500 ml suggest some ways of using the jug and bottle to fill the buckets. The answer is 0.3km What is the question? Top tips Create a diagram or table which will help people convert between these metric units of length: mm cm m km	Arithmetic practice
4	<ul style="list-style-type: none">understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pintssolve problems involving converting between units of timeuse all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling WALT give approximate equivalents to imperial and metric measures WAP converting between imperial and metric measures WALT convert between units of time WALT read a timetable WALT reason about the information in a timetable	<ul style="list-style-type: none">Convert between metric and imperial unitsConverting units of timeCalculate with timetables	Ruler, metre stick, other measuring scales, bar model <i>imperial, inch, foot, yard, mile, pound, pint</i>	Working backwards Put these lengths of time in order starting with the longest time. 105 minutes 1 hour 51 minutes 6360 seconds What do you notice?  1 minute = 60 seconds 60 minutes = seconds Fill in the missing number of seconds. Write down some more time facts like this. What's the same, what's different ...between a timetable and a line graph. Comparison My height in metric units is 1.75 m. In Imperial units it's 5 ft 9 inches. Which way of describing my height do you prefer? Why?	Arithmetic practice
5	Measurement Volume				
	<ul style="list-style-type: none">estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] WAL the difference between volume and capacity	<ul style="list-style-type: none">Cubic centimetresCompare volumeEstimate volumeEstimate capacity	Cm ³ , m ³	Always, sometimes, never A cuboid is taller than a cube made if both are made with the same number of smaller cubes. Another, and another, ...	Arithmetic practice

	<p>WALT understand conservation of volume</p> <p>WALT compare the volume of different 3-D objects</p> <p>WALT use cubes and cuboids to estimate volume</p> <p>WALT use estimate the capacity of a container</p>			<p>Make a cuboid from smaller cubes where the height is twice the length which is twice the width. How many small cubes did you use?</p> <p>Now make another, ... and another...</p> <p>Other possibilities</p> <p> A cuboid is made up of 36 smaller cubes.</p> <p>If the cuboid has the length of two of its sides the same [?] what could the dimensions be?</p> <p>Convince me.</p> <p>NRICH Pouring Problem (online resource)</p>	
	Consolidation				