


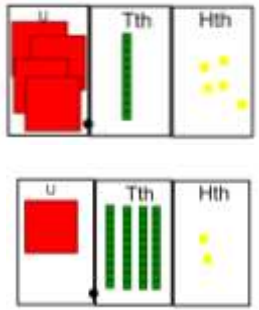



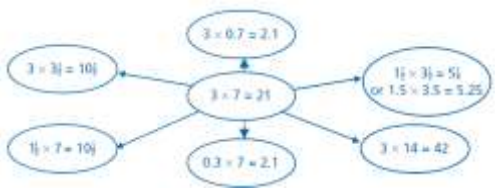




Autumn		Spring		Summer	
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Below zero	Comparing fractions and decimals	Missing numbers	Mixed operations	Sequences	Remainders
Measuring with decimals	Long division (chunking)	Perimeter and area (parallelograms and triangles)	Angles***	Calculating with fractions	Volume and capacity
Multiplication (formal method)	All about shapes - circles	Calculating with decimals	Ratio***	Calculating percentages	Scaling
<p>Use negative numbers in context, and calculate intervals across zero</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>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p>	<p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p> <p>Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.</p>	<p>Generate and describe linear number sequences</p> <p>Identify the value given to each digit in numbers given to three decimal place and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places</p> <p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p>	<p>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</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>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p>	<p>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p> <p>Solve problems involving calculation of percentages (for example, of measures, as such as 15% of 360) and the use of percentages for comparison</p>	<p>Divide numbers up to 4 digits by a two digit whole number using the formal written method of long division and interpret remainders as whole number remainders, fractions, fractions, or by rounding, as appropriate to the context.</p> <p>Solve problems involving similar shapes where the scale factor is known or can be found</p>

Addition: Phase 6			
Mental methods	Written methods	Visual images and models	Vocabulary
<p>Add negative numbers.</p> <p>Continue to practise fast responses to mental maths questions, for increasingly large numbers.</p> <p>Solve word problems including missing number problems using number facts, place value and addition/subtraction.</p> <p>To add mixed numbers and fractions.</p>	<p>Use efficient written methods to add integers and decimals. Extend methods to numbers with any numbers of digits.</p> <p> Children record:</p> $\begin{array}{r} 3481.9 \\ + 2.68 \\ \hline 3484.58 \end{array}$ $\begin{array}{r} 26.85 \\ + 174.29 \\ \hline 201.14 \end{array}$ $\begin{array}{r} 0.71 \\ + 1243.7 \\ \hline 1244.41 \end{array}$ $\begin{array}{r} 3509.46 \\ + 63.5 \\ \hline 3572.96 \end{array}$ $\begin{array}{r} 1484.17 \\ + 1.121 \\ \hline 1485.291 \end{array}$	<p>Place the digit cards 3-9 to solve this problem</p> <p>Find the missing digits:</p> $\begin{array}{r} \square\square\square\square \\ + \square\square\square \\ \hline 4.524 \\ \hline \end{array}$  <p>= 428.76</p> <p>(Continue to explore place value using a different base, including binary.)</p>	<p>Add, addition, more, plus, make, sum, total, altogether score</p> <p>How many more to make...?</p> <p>How many more is...than..?</p> <p>Tens</p> <p>Units</p> <p>Hundreds</p> <p>Thousands</p> <p>Ten thousands</p> <p>Tenths</p> <p>Hundredths</p> <p>Thousandths</p> <p>Exchange</p> <p>Resources:</p> <p>Base 10/Dienes, place value ITP, calculators, numicon for decimals, numicon hoods.</p>

Subtraction: Phase 6			
Mental	Written	Visual images and models	Vocabulary
<p>Add and subtract negative numbers.</p> <p>To subtract mixed numbers and fractions.</p> <p>Continue to practise fast responses to mental maths questions, for increasingly large</p>	<p>Use efficient written methods to subtract integers with 5 and 6 digits and decimals.</p> <p> Children record:</p> $\begin{array}{r} 5131 \\ - 26467 \\ \hline 13783 \end{array}$ <p>Using column method, subtract two or more decimal fractions with up to three digits and up to</p>	<p>$\begin{array}{r} 31 \\ 4.15 \\ - 1.42 \\ \hline 2.73 \end{array}$</p> 	<p>Decrease</p> <p>Exchange</p> <p>Expanded method</p> <p>Inverse</p> <p>Counting up</p> <p>Estimate</p> <p>Resources:</p> <p>Arrow cards</p> <p>Base ten and place value boards</p> <p>Money</p>

Multiplication: Phase 6			
Mental	Written	Visual images and models	Vocabulary
<p>Use understanding of place value to multiply whole numbers and decimals by 10, 100 or 1000</p> <p>Know by heart the squares of all numbers from 1×1 to 12×12. Derive quickly squares of multiples of 10 to 100, such as 20^2, 80^2.</p> <p>Respond rapidly to oral or written questions, explaining the strategy used.</p> <p>For example:</p> <ul style="list-style-type: none"> • Two nineteens • Double 75 • 11 times 8... 9 multiplied by 8 • Multiply 25 by 8... by zero... by 1 • Is 210 a multiple of 6? How do you know? • What is the product of 125 and 4? • Find all the different products you can make using two of these: 0.2, 1.4, 0.03, 1.5, 0.5. <p>Mental Calculation with decimals</p> <p>$0.3 \times 6 = ?$ $3 \times 6 = 18$ $0.3 \times 6 = 1.8$</p>	<p>Consolidate long multiplication (contracted).</p> <p> Children record:</p> $\begin{array}{r} 237 \\ \times 25 \\ \hline 11835 \\ 47140 \\ \hline = 5925 \end{array}$ <p>Use efficient written methods to x integers and decimals by a 1 digit integer.</p> <p> Horizontal partitioning with decimals</p> $\begin{array}{l} 4.9 \times 3 = \\ 4.0 \times 3 = 12.0 \\ 0.9 \times 3 = \underline{2.7} \\ 14.7 \end{array}$ <p> Extending to:</p> $\begin{array}{r} 23.75 \\ \times 3 \\ \hline 71.25 \end{array}$ <p>Understand and use when appropriate the principles of the commutative, associative and distributive laws as they apply to multiplication:</p> <p>Example of commutative law $95 \times 78 = 78 \times 95$</p> <p>Example of associative law $10.4 \times 40 = 10.4 \times (10 \times 4)$ or $(10.4 \times 10) \times 4$</p> <p>Example of distributive law $46 \times 98 = 46 \times (100 - 2) = (46 \times 100) - (46 \times 2) = 4600 - 92 = 4508$</p>	<p>Place value cards still used to support partitioning, to ensure the process is explicit.</p> <p>Work out the 24 times table facts by doubling the 6 times table facts and doubling again.</p> <p>Work out:</p> $1 \times 32 = 32$ and so deduce that $2 \times 32 = 64$ $4 \times 32 = 128$ $8 \times 32 = 256$ $16 \times 32 = 512 \dots$ <p>Use combinations of these facts to work out other multiples of 32.</p>  <p>Use knowledge that in exact multiples of:</p> <ul style="list-style-type: none"> 4 the last two digits are divisible by 4; 6 the number is even and divisible by 3; 8 the last 3 digits are divisible by 8; 9 the sum of the digits is divisible by 9. 	<p>lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times... times as (big, long, wide... and so on), repeated addition, array, row, column, double, halve, factors, prime, square, square root, composite.</p> <p>Resources</p> <ul style="list-style-type: none"> Numicon Hundred grid Number lines Multilink Coins Dienes/Base 10 Counters Counting stick Bead strings Containers Arrow cards Place value sliders ITPs

Division: Phase 6

Mental	Written	Visual images and models	Vocabulary						
<p>Where calculations are set out in columns, know that units should line up under units, tenths under tenths...</p> <p>Estimate, Calculate, Check (ECC)</p>	<p>Use compact efficient methods to divide integers and decimals by 1 digit integer.</p> <p> Children record:</p> $87.5 \div 7$ $\begin{array}{r} 12.5 \\ 7 \overline{) 87.5} \end{array}$ $87.43 \div 7$ $\begin{array}{r} 12.49 \\ 7 \overline{) 87.43} \end{array}$ <p>Long division HTU \div TU</p> <p> Children record:</p> $972 \div 36$ $\begin{array}{r} 36 \overline{) 972} \\ - 720 \quad \mathbf{20 \times 36} \\ \underline{252} \quad \mathbf{7 \times 36} \\ 0 \quad \mathbf{= 27} \end{array}$ $\begin{array}{r} 027 \\ 36 \overline{) 972} \end{array}$ <p>Children should estimate answers first:</p> <p>$972 \div 36$ is approximately $1000 \div 40 = 25$.</p> <table style="width: 100%; border: none;"> <tr> <td style="border: none;">$\begin{array}{r} 36 \overline{) 972} \\ - 720 \\ \underline{252} \\ - 252 \\ 0 \end{array}$</td> <td style="border: none; padding-left: 20px;">20×36</td> <td style="border: none;">$\begin{array}{r} 27 \\ 36 \overline{) 972} \\ - 72 \\ \underline{252} \\ - 252 \\ 0 \end{array}$</td> </tr> <tr> <td style="border: none;">Answer:</td> <td style="border: none;">27</td> <td style="border: none;"></td> </tr> </table>	$\begin{array}{r} 36 \overline{) 972} \\ - 720 \\ \underline{252} \\ - 252 \\ 0 \end{array}$	20×36	$\begin{array}{r} 27 \\ 36 \overline{) 972} \\ - 72 \\ \underline{252} \\ - 252 \\ 0 \end{array}$	Answer:	27		<p>Use division to convert simple fractions into decimals ($\frac{1}{2}$, $\frac{1}{4}$)</p> $\frac{1}{2} = ?$ $10 \div 2 = 5$ $1 \div 2 = 0.5$ <p>Multiply by $\frac{1}{2}$ or $\frac{1}{4}$ (divide by 2 or 4) – dividing by 2 is the same as halving</p> $\frac{1}{2} \text{ of } 18 = 18 \div 2 = \frac{18}{2}$	<p>lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times... times as (big, long, wide... and so on), repeated addition, array, row, column, double, halve.</p>
$\begin{array}{r} 36 \overline{) 972} \\ - 720 \\ \underline{252} \\ - 252 \\ 0 \end{array}$	20×36	$\begin{array}{r} 27 \\ 36 \overline{) 972} \\ - 72 \\ \underline{252} \\ - 252 \\ 0 \end{array}$							
Answer:	27								