





Unit Overview and Guidance

- The exemplification has been taken from the NCETM Resource Toolkit, with additions in order to ensure full coverage.
- White Rose planning links (with questions categorised into the three aims of the national curriculum i.e. fluency, problem solving and reasoning) are hyperlinked to each of the objectives.
- NCETM reasoning questions have been incorporated and are identified in pale purple boxes
- The 'big Ideas' sections from the NCETM 'Teaching for Mastery' documents have been included at the start of each unit. Hyperlinks to the full NCETM 'Teaching for Mastery' documents have also been included for easy reference.
- Hyperlinks to NRich activities have also been added to this version. These are found by clicking on the blue buttons like this one  at the bottom of relevant objective.
- Some additional content has been added in order to support mixed-aged planning. Any additional content is in italics and strikethrough has been used to identify when an objective has been altered.
- Each unit is sub-divided into sections for ease of planning. Sub-categories in this unit are;
 1. Multiplication and division
 2. Derive and recall x÷
 3. Checking
 4. Number Types
 5. Solving Problems
 6. Ratio and Proportion (Year 6)


	Yr 3	Yr 4	Yr 5	Yr 6
NCETM Teaching for Mastery Questions, tasks and activities to support assessment	<p>The Big Ideas</p> <p>It is important for children not just to be able to chant their multiplication tables but also to understand what the facts in them mean, to be able to use these facts to figure out others and to use in problems. It is also important for children to be able to link facts within the tables (e.g. 5x is half of 10x).</p> <p>They understand what multiplication means, see division as both grouping and sharing, and see division as the inverse of multiplication.</p>	<p>The Big Ideas</p> <p>It is important for children not just to be able to chant their multiplication tables but to understand what the facts in them mean, to be able to use these facts to figure out others and to use them in problems.</p> <p>It is also important for children to be able to link facts within the tables (e.g. 5x is half of 10x).</p> <p>They understand what multiplication means and see division as both grouping and sharing, and to see division as the inverse of multiplication.</p> <p>The distributive law can be used to partition numbers in different ways to create equivalent calculations. For example, $4 \times 27 = 4 \times (25 + 2) = (4 \times 25) + (4 \times 2) = 108$.</p> <p>Looking for equivalent calculations can make calculating easier. For example, 98×5 is equivalent to $98 \times 10 \div 2$ or to $(100 \times 5) - (2 \times 5)$. The array model can help show equivalences.</p>	<p>The Big Ideas</p> <p>Pupils have a firm understanding of what multiplication and division mean and have a range of strategies for dealing with large numbers, including both mental and standard written methods. They see the idea of factors, multiples and prime numbers as connected and not separate ideas to learn.</p> <p>They recognise how to use their skills of multiplying and dividing in new problem solving situations.</p> <p>Fractions and division are connected ideas:</p> $36 \div 18 = \frac{36}{18} = 2; \frac{18}{36} = \frac{1}{2}$ <p>Factors and multiples are connected ideas:</p> <p>48 is a multiple of 6 and 6 is a factor of 48.</p>	<p>The Big Ideas</p> <p>Standard written algorithms use the conceptual structures of the mathematics to produce efficient methods of calculation.</p> <p>Standard written multiplication method involves a number of partial products. For example, 36×24 is made up of four partial products 30×20, 30×4, 6×20, 6×4.</p> <p>There are connections between factors, multiples and prime numbers and between fractions, division and ratios.</p> <p>The Big Ideas (Ratio and Proportion)</p> <p>It is important to distinguish between situations with an additive change or a multiplicative change (which involves ratio). For example, if four children have six sandwiches to share and two more children join them, although two more children have been added, the number of sandwiches then needed for everyone to still get the same amount is calculated multiplicatively.</p>
		Teaching for Mastery Year 3	Teaching for Mastery Year 4	Teaching for Mastery Year 5

NUMBER: Multiplication and Division (NMD - 5 weeks)

NUMBER: Multiplication and Division (NMD - 5 weeks)

Strand	Yr3	Yr4	Yr5	Yr6
Multiplication and Division	Mental Calculations	<p>use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers</p> <p>Children should be able to practise mental methods and extend this to three-digit numbers to derive facts for example $200 \times 3 = 600$ into $600 \div 3 = 200$.</p> <p>Plants are sold in trays of 20. Hannah buys 7 trays. How many plants does she buy?</p> <p>Eggs are sold in trays of 30 eggs.</p>  <p>The trays can be stacked in six layers. How many eggs are in this picture?</p>	<p>multiply and divide numbers mentally, drawing upon known facts</p> <p>Rehearse multiplication facts and use these to derive division facts, to find factors of two-digit numbers and to multiply multiples of 10 and 100, e.g. 40×50.</p> <p>Use and discuss mental strategies for special cases of harder types of calculations for example to work out $274 + 96$, or $8006 - 2993$, 35×11, $72 \div 3$, 50×900. etc</p> <p>Use factors to work out a calculation such as 16×6 by thinking of it as $16 \times 2 \times 3$.</p> <p>Record their methods using diagrams (such as number lines) or jottings and explain methods to each other. Compare alternative methods for the same calculation and discuss any merits and disadvantages.</p>	<p>perform mental calculations, including with mixed operations and large numbers</p> <p>Use mental strategies to calculate in their heads, using jottings and/or diagrams where appropriate for example, to calculate 24×15, they multiply 24×10 and then halve this to get 24×5, adding these two results together. They record their method as $(24 \times 10) + (24 \times 5)$. Alternatively, they work out $24 \times 5 = 120$ (half of 24×10), then multiply 120 by 3 to get 360.</p>  <p>use their knowledge of the order of operations to carry out calculations involving the four operations</p> <p>e.g. $60 - 42 \div 6 = \square$</p>
	Written Calculations - Multiplication		<p>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p> <p>e.g. 68×7 and 358×9</p>	<p>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</p> <p>Develop and refine written methods for multiplication.</p> <p>Move from expanded layouts (such as the grid method) towards a compact layout for $HTU \times U$ and $TU \times TU$ calculations.</p> <p>Suggest what the approximate answer to be before starting a calculation and use this to check that the answer sounds sensible. For example, 56×27 is approximately $60 \times 30 = 1800$.</p> 

NUMBER: Multiplication and Division (NMD - 5 weeks)

Multiplication and Division	Written Calculations - Division		<p>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> <p>Extend written methods for division to include $HTU \div U$, including calculations with remainders. Suggest an approximate answer before starting a calculation and use this to check that the answer sounds sensible. Increase the efficiency of the methods being used for example:</p> <p>$196 \div 6$ is approximately $200 \div 5 = 40$</p> <p>$32 \text{ r}4$ or $4/6$ or $2/3$ (as well as using short division methods)</p> <p>Know that, depending on the context, answers to division questions may need to be rounded up or rounded down. Explain whether to round up or down to answer problems such as:</p> <ul style="list-style-type: none"> - Egg boxes hold 6 eggs. A farmer collects 439 eggs. How many boxes can he fill? - Egg boxes hold 6 eggs. How many boxes must a restaurant buy to have 200 eggs? 	<p>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> <p>Every day a machine makes 100 000 paper clips, which go into boxes. A full box has 120 paper clips. How many full boxes can be made from 100 000 paper clips?</p> <p>Each paper clip is made from 9.2 centimetres of wire. What is the greatest number of paper clips that can be made from 10 metres of wire?</p> <p>A DJ has two different sized storage boxes for her CDs. Small boxes hold 15 CDs. Large boxes hold 28 CDs. The DJ has 411 CDs. How could the DJ pack her CDs?</p> <p>use written division methods in cases where the answer has up to two decimal places</p> <p>Children should be able to calculate 601 divided by 36, to two decimal places etc.</p>						
	NCETM Reasoning	<p>Use a fact</p> <p>$20 \times 3 = 60$.</p> <p>Use this fact to work out</p> <p>$21 \times 3 =$ $22 \times 3 =$</p> <p>$23 \times 3 =$ $24 \times 3 =$</p> <p>Prove It</p> <p>What goes in the missing box?</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="width: 30px; height: 20px;">x</td> <td style="width: 30px; height: 20px;">?</td> <td style="width: 30px; height: 20px;">?</td> </tr> <tr> <td style="width: 30px; height: 20px;">4</td> <td style="width: 30px; height: 20px;">80</td> <td style="width: 30px; height: 20px;">12</td> </tr> </table> <p>Prove it.</p> <p>How close can you get?</p> <p>$\square \square \times \square$</p> <p>Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product?</p>	x	?	?	4	80	12	<p>Use a fact</p> <p>$63 \div 9 = 7$</p> <p>Use this fact to work out</p> <p>$126 \div 9 =$</p> <p>$252 \div 7 =$</p> <p>Prove It</p> <p>What goes in the missing box?</p> <p>$6 \square \times 4 = 512$</p> <p>Prove it.</p> <p>How close can you get?</p> <p>$\square \square \square \times 7$</p> <p>Using the digits 3, 4 and 6 in the calculation above how close can you get to 4500? What is the largest product? What is the smallest product?</p>	<p>Use a fact</p> <p>$3 \times 75 = 225$</p> <p>Use this fact to work out</p> <p>$450 \div 6 =$</p> <p>$225 \div 0.6 =$</p> <p>To multiply by 25 you multiply by 100 and then divide by 4. Use this strategy to solve</p> <p>48×25 78×25</p> <p>4.6×25</p> <p>Prove It</p> <p>What goes in the missing box?</p> <p>$12 \square \div 6 = 212$</p> <p>$12 \square \div 7 = 212$</p> <p>$22 \square \div 7 = 321 \text{ r}6$</p> <p>$323 \times \square 1 = 13243$</p> <p>Prove it.</p>
x	?	?								
4	80	12								

NUMBER: Multiplication and Division (NMD - 5 weeks)

Derive and Recall x:-	Derive and Recall x:-	<p>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p> <ul style="list-style-type: none"> multiply seven by three; what is four multiplied by nine? Etc. Circle three numbers that add to make a multiple of 4 11 12 13 14 15 16 17 18 19 Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with? At Christmas, there are 49 chocolates in a tin and Tim shares them between himself and 7 other members of the family. How many chocolates will each person get? 	<p>recall multiplication and division facts for multiplication tables up to 12 x 12</p> <p>Children should be able to continue to practise recalling and using multiplication tables and related division facts to aid fluency.</p> <ul style="list-style-type: none"> One orange costs eleven pence, how much will three oranges cost? 	
	NCETM Reasoning	<p>Missing numbers 24 = <input type="text"/> x <input type="text"/></p> <p>Which pairs of numbers could be written in the boxes?</p> <p>Making links Cards come in packs of 4. How many packs do I need to buy to get 32 cards?</p>	<p>Missing numbers 72 = <input type="text"/> x <input type="text"/></p> <p>Which pairs of numbers could be written in the boxes?</p> <p>Making links Eggs are bought in boxes of 12. I need 140 eggs; how many boxes will I need to buy?</p> <p>Making links 4 x 6 = 24 How does this fact help you to solve these calculations? 40 x 6 = 20 x 6 = 24 x 6 =</p>	<p>Missing numbers 6 x 0.9 = <input type="text"/> x 0.03 6 x 0.04 = 0.008 x <input type="text"/></p> <p>Which numbers could be written in the boxes?</p> <p>Making links Apples weigh about 170 g each. How many apples would you expect to get in a 2 kg bag?</p>

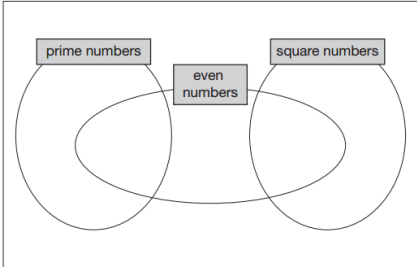
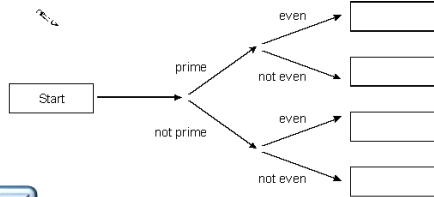
NUMBER: Multiplication and Division (NMD - 5 weeks)

Checking	Checking	<p>estimate the answer to a calculation and use inverse operations to check answers</p> <p>Matthew says if he has 75 sweets shared by 5 friends, they will each have 17 sweets. Write down a multiplication question that you could do to check this?</p>		<p>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>Use rounding to approximate and check e.g. $2593 + 6278$ must be more than $2500 + 6200$ $2403 - 1998$ is about $2400 - 2000$</p> <p>Write approximate answers to calculations, e.g. write an approximate answer for $516 \div (15 + 36)$</p>	
	NCETM Reasoning	<p>Use the inverse</p> <p>Use the inverse to check if the following calculations are correct</p> <p>$23 \times 4 = 82$ $117 \div 9 = 14$</p> <p>Size of an answer</p> <p>Will the answer to the following calculations be greater or less than 80</p> <p>$23 \times 3 =$ $32 \times 3 =$ $42 \times 3 =$ $36 \times 2 =$</p>	<p>Use the inverse</p> <p>Use the inverse to check if the following calculations are correct:</p> <p>$23 \times 4 = 92$ $117 \div 9 = 14$</p> <p>Size of an answer</p> <p>Will the answer to the following calculations be greater or less than 300</p> <p>$152 \times 2 =$ $78 \times 3 =$ $87 \times 3 =$ $4 \times 74 =$</p>	<p>Use the inverse</p> <p>Use the inverse to check if the following calculations are correct:</p> <p>$4321 \times 12 = 51852$ $507 \div 9 = 4563$</p> <p>Size of an answer</p> <p>The product of a two digit and three digit number is approximately 6500. What could the numbers be?</p>	<p>Use the inverse</p> <p>Use the inverse to check if the following calculations are correct:</p> <p>$2346 \times 46 = 332796$ $27.74 \div 19 = 1.46$</p> <p>Size of an answer</p> <p>The product of a single digit number and a number with two decimal places is 21.34. What could the numbers be?</p>

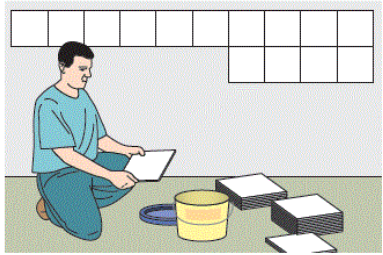

NUMBER: Multiplication and Division (NMD - 5 weeks)

Number Types	Multiples and factors	<p>(Y4 adapted) Begin to recognise and use factor pairs and commutativity in mental calculations within the multiplication facts that they have learnt</p> <p>See Yr 4 for examples</p> <p><u>recognise and use factor pairs and commutativity in mental calculations</u></p> <p>Children should be able to write statements about the equality of expressions (e.g. use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$).</p> <p>They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations e.g. $2 \times 6 \times 5 = 10 \times 6$.</p> <p><i>e.g. Understand and use when appropriate the principles (but not the names) of the commutative, associative and distributive laws as they apply to multiplication:</i></p> <p><i>Example of commutative law $8 \times 15 = 15 \times 8$</i></p> <p><i>Example of associative law $6 \times 15 = 6 \times (5 \times 3) = (6 \times 5) \times 3 = 30 \times 3 = 90$</i></p> <p><i>Example of distributive law $18 \times 5 = (10 + 8) \times 5 = (10 \times 5) + (8 \times 5) = 50 + 40 = 90$</i></p>	<p><u>identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers</u></p> <p>Use the vocabulary factor, multiple and product.</p> <p>Identify all the factors of a given number; for example, the factors of 20 are 1, 2, 4, 5, 10 and 20.</p> <p>Answer questions such as:</p> <ul style="list-style-type: none"> Find some numbers that have a factor of 4 and a factor of 5. What do you notice? My age is a multiple of 8. Next year my age will be a multiple of 7. How old am I? 	<p><u>identify common factors and common multiples</u></p> <ul style="list-style-type: none"> How can you use factors to multiply 17 by 12? Start from a two-digit number with at least six factors, e.g. 72. How many different multiplication and division facts can you make using what you know about 72? What facts involving decimals can you derive? What if you started with 7.2? What about 0.72? use their knowledge of the order of operations to carry out calculations involving the four operations <p>Children should be able to find answers to calculations such as $5.6 \square = 0.7$ or 3×0.6, drawing on their knowledge of number facts and understanding of place value. They should be able to approximate, use inverses and apply tests of divisibility to check their results.</p> <p>Write these numbers in the correct places on the sorting diagram – 16; 26; 36</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> </div> <div style="display: flex; justify-content: center; gap: 5px;"> <div style="border: 1px solid gray; padding: 2px 5px;">1</div> <div style="border: 1px solid gray; padding: 2px 5px;">2</div> <div style="border: 1px solid gray; padding: 2px 5px;">3</div> <div style="border: 1px solid gray; padding: 2px 5px;">4</div> <div style="border: 1px solid gray; padding: 2px 5px;">5</div> </div>
	Squares and Cubes	<p><u>recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</u></p> <p>Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes</p> <p>Use knowledge of multiplication facts to derive quickly squares of numbers to 12×12 and the corresponding squares of multiples of 10. They should be able to answer problems such as:</p> <p>Tell me how to work out the area of a piece of cardboard with dimensions 30 cm by 30 cm</p> <p>Find two square numbers that total 45</p> <div style="display: flex; justify-content: center; gap: 5px;"> <div style="border: 1px solid gray; padding: 2px 5px;">1</div> <div style="border: 1px solid gray; padding: 2px 5px;">2</div> <div style="border: 1px solid gray; padding: 2px 5px;">3</div> <div style="border: 1px solid gray; padding: 2px 5px;">4</div> </div>	<p>(Y5 extended) recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</p> <p>Children should know the square numbers up to 12×12 and derive the corresponding squares of multiples of 10, for example $80 \times 80 = 6400$.</p> <p>e.g. $3^2 + 10 =$</p>	

NUMBER: Multiplication and Division (NMD - 5 weeks)

Number Types	Prime Numbers		<p>know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</p> <p>establish whether a number up to 100 is prime and recall prime numbers up to 19</p> <p>Recognise that numbers with only two factors are prime numbers and can apply their knowledge of multiples and tests of divisibility to identify the prime numbers less than 100.</p> <p>Explain that 73 children can only be organised as 1 group of 73 or 73 groups of 1, whereas 44 children could be organised as 1 group of 44, 2 groups of 22, 4 groups of 11, 11 groups of 4, 22 groups of 2 or 44 groups of 1.</p> <p>Explore the pattern of primes on a 100-square, explaining why there will never be a prime number in the tenth column and the fourth column</p> <p>Use the numbers to complete the sentences below. You can use a number more than once</p> <p>5, 6, 7, 8, 9, 10</p> <p><input type="checkbox"/> and <input type="checkbox"/> are factors of 20</p> <p><input type="checkbox"/> and <input type="checkbox"/> are prime numbers</p> <p><input type="checkbox"/> and <input type="checkbox"/> are multiples of 3</p> <p><input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/></p>	<p>Identify prime numbers</p> <p>Write each number in its correct place in the diagram</p> <p>16 17 18 19</p>  <p>Use the sorting machine below to decide where each of the following numbers will go –</p> <p>17, 15, 72</p>  <p><input type="button" value="1"/></p>
	NCEITM Reasoning	<p>True or false?</p> <p>All the numbers in the two times table are even.</p> <p>There are no numbers in the three times table that are also in the two times table.</p>	<p>Always, sometimes, never?</p> <p>Is it always, sometimes or never true that an even number that is divisible by 3 is also divisible by 6.</p> <p>Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.</p> <p>Making links</p> <p>How can you use factor pairs to solve this calculation?</p> <p>13 x 12 (13 x 3 x 4, 13 x 3 x 2 x 2, 13 x 2 x 6)</p>	<p>Always, sometimes, never?</p> <p>Is it always, sometimes or never true that multiplying a number always makes it bigger</p> <p>Is it always, sometimes or never true that prime numbers are odd.</p> <p>Is it always, sometimes or never true that when you multiply a whole number by 9, the sum of its digits is also a multiple of 9</p> <p>Is it always, sometimes or never true that a square number has an even number of factors?</p>

NUMBER: Multiplication and Division (NMD - 5 weeks)

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Solving Problems</p>	<p>solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects</p> <p>Miss West needs 28 paper cups. She has to buy them in packs of 6</p> <p>How many packs does she have to buy?</p> <p>Tom is laying tiles. He has 84 tiles; how many complete rows and columns could he make?</p>  <p>Fill in the missing digits in these calculations</p> $\begin{array}{r} 2 \square \\ \times 8 \\ \hline 176 \end{array}$ $\begin{array}{r} 2 \square \\ \times \square \\ \hline 112 \end{array}$ $\begin{array}{r} 1 \square 4 \\ \times \square \\ \hline 736 \end{array}$ <p><input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/></p>	<p>solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects</p> <p>Children should be able to solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.</p> <p><i>e.g. 185 people go to the school concert. They pay £1.35 each. How much ticket money is collected?</i></p> <p><i>Programmes cost 15p each. Selling programmes raises £12.30. How many programmes are sold?</i></p>	<p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</p> <p>Cream cheese costs £3.60 per kilogram Bobby spends 90p on a pot of cream cheese. How much cheese does Bobby buy?</p> <p>Here are the ingredients for chocolate ice cream</p> <table border="1" data-bbox="1214 347 1496 529"> <tr><td>cream</td><td>400 ml</td></tr> <tr><td>milk</td><td>500 ml</td></tr> <tr><td>egg yolks</td><td>4</td></tr> <tr><td>chocolate</td><td>120 g</td></tr> <tr><td>sugar</td><td>100 g</td></tr> </table>  <p>Stefan only has 300ml of cream, how much chocolate should he use?</p> <p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p> <p><input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/></p> <p>Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</p> <p><input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/></p>	cream	400 ml	milk	500 ml	egg yolks	4	chocolate	120 g	sugar	100 g	<p>solve problems involving multiplication and division</p> <p>use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>Children should be able to:</p> <p>Give the best approximation to work out 4.4×18.6</p> <p>and explain why. Answer questions such as: roughly, what answer do you expect to get? How did you arrive at that estimate? Do you expect your answer to be greater or less than your estimate? Why?</p> <p><input type="button" value="1"/></p>
	cream	400 ml												
milk	500 ml													
egg yolks	4													
chocolate	120 g													
sugar	100 g													
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Ratio and Proportion</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Proportionality</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>Children recognise proportionality in context when relations between quantities are in the same ratio, such as recipes and similar shapes.</p> <p>Children consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use notation such as a:b to record their work.</p> <p><input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/></p>										

NUMBER: Multiplication and Division (NMD - 5 weeks)

Ratio and Proportion

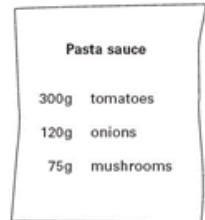
Proportionality

This map has a scale of 1 cm to 6 km.



The road from Ridlington to Carborough measured on the map is 6.6 cm long. What is the length of the road in kilometres?

Here is a recipe for pasta sauce: -



Sam makes the pasta sauce using 900 g of tomatoes.

What weight of onions should he use? What weight of mushrooms?

A recipe for 3 portions requires 150 g flour and 120 g sugar.

Desi's solution to a problem says that for 2 portions he needs 80 g flour and 100 g sugar.

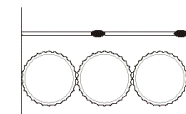
What might Desi have done wrong? Work out the correct answer.

Purple paint is made by mixing red and blue paint



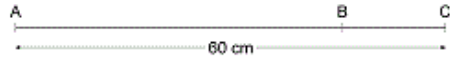
How many tins of red paint are needed to make 25 tins of purple?

Two matchsticks have the same length as three bottle tops -



How many bottle tops are same length as 50 matchsticks?

NUMBER: Multiplication and Division (NMD - 5 weeks)

Ratio and Proportion	Scale Factors			<p>solve problems involving similar shapes where the scale factor is known or can be found</p> <p>Solve simple problems involving direct proportion by scaling quantities up or down, for example:</p> <p>Two rulers cost 80 pence. How much do three rulers cost?</p> <p>Use the vocabulary of ratio and proportion to describe the relationships between two quantities solving problems such as:</p> <p>Two letters have a total weight of 120 grams. One letter weighs twice as much as the other. Write the weight of the heavier letter.</p> <p>The distance from A to B is three times as far as from B to C. The distance from A to C is 60 centimetres. Calculate the distance from A to B.</p> 
	NCETM Reasoning			<p>What else do you know?</p> <p>In a flower bed a gardener plants 3 red bulbs for every 4 white bulbs. How many red and white bulbs might he plant?</p> <p>If she has 100 white bulbs, how many red bulbs does she need to buy?</p> <p>If she has 75 red bulbs, how many white bulbs does she need to buy?</p> <p>If she wants to plant 140 bulbs altogether, how many of each colour should she buy?</p> <p>Do, then explain</p> <p>Purple paint is made from red and blue paint in the ratio of 3:5.</p> <p>To make 40 litres of purple paint how much would I need of each colour? Explain your thinking.</p> <p>Unpicking</p> <p>A recipe needs to include three times as much apple than peach. The total weight of apples and peaches in a recipe is 700 grams. How much apple do I need?</p>