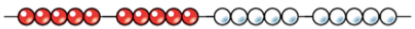
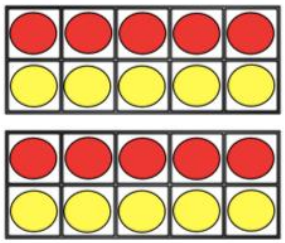
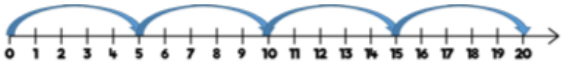
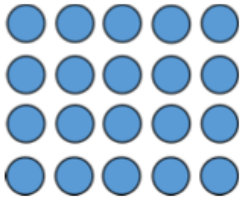
St Thomas More Catholic Primary School Calculation Policy

YEAR 1 – MULTIPLICATION AND DIVISION

National Curriculum requirements:
To solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

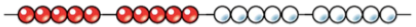
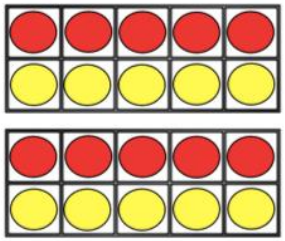
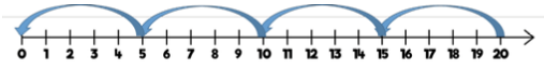
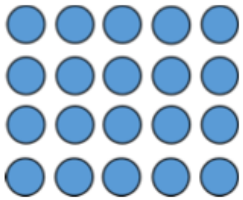
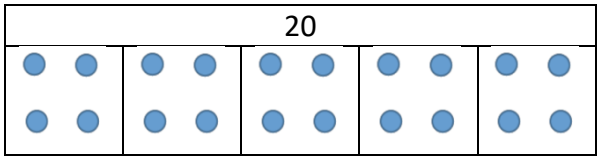
Operation: Multiplication
Skill: To Solve 1-step problems using multiplication, e.g. 5 + 5 + 5 + 5 = 20 (4 x 5 = 20).

Concrete	Pictorial	Abstract
Represent multiplication as repeated addition in a variety of ways. Numicon  Bead strings/ Rekenreks  Tens frames 	Showing equal jumps of repeated addition on a numberline  Drawing arrays 	Written calculations of repeated addition 5 + 5 + 5 + 5 = 20 20 = 5 + 5 + 5 + 5 Mental recall of doubles

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To solve 1-step problems by sharing or grouping, e.g. 20 ÷ 5 = 4.

Concrete	Pictorial	Abstract
Children can represent division by sharing amounts into equal groups or by grouping and then counting the number of groups. Numicon  Bead strings/ Rekenreks  Tens frames 	Showing equal jumps of repeated subtraction on a numberline  Drawing arrays  Bar models with jottings/ dots  	Counting aloud forward and backwards in steps, e.g. 2, 4, 6, 8, 10 Mental recall of halves

YEAR 2 – MULTIPLICATION AND DIVISION

National Curriculum requirements:

To recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.

To calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs.

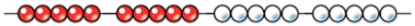
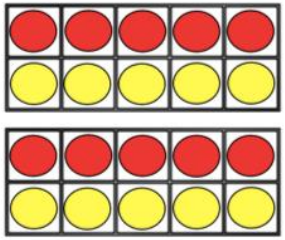
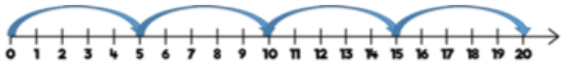
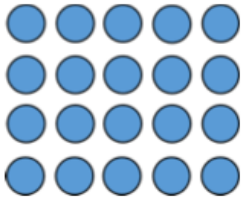
To show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

To solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

St Thomas More Catholic Primary School Calculation Policy

Operation: Multiplication

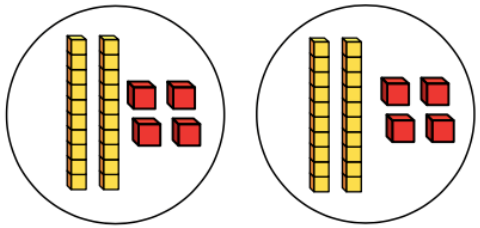
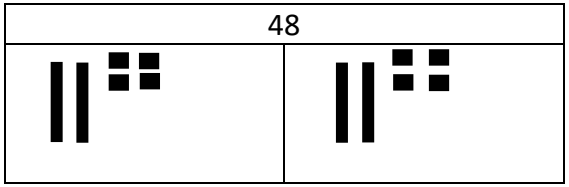
Skill: To Solve 1-step problems using multiplication, e.g. 4 x 5 = 20.

Concrete	Pictorial	Abstract
Represent multiplication as repeated addition in a variety of ways. Numicon  Bead strings/ Rekenreks  Tens frames 	Showing equal jumps of repeated addition on a numberline  Drawing arrays 	Written calculation using repeated addition and multiplication sentences 5 + 5 + 5 + 5 = 20 20 = 5 + 5 + 5 + 5 4 x 5 = 20 20 = 4 x 5 5 x 4 = 20 20 = 5 x 4 Counting aloud in steps, focusing on 2s, 5s and 10s e.g. 2, 4, 6, 8, 10 Mental recall of doubles

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To divide 2 digit numbers by a 1 digit number, e.g. 48 ÷ 2 = 24.

Concrete	Pictorial	Abstract
Children can represent division by sharing amounts into equal groups or by grouping and then counting the number of groups using Numicon, bead strings, tens frames, dienes or place value counters. 	Bar models or part whole models with jottings/ dots. Share out the tens representations and then the ones. 	Written calculations 48 ÷ 2 = 24 2 = 48 ÷ 24 48 ÷ 24 = 2 24 = 48 ÷ 2 Counting backwards in steps, e.g. 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0. Mental recall of halves

YEAR 3 – MULTIPLICATION AND DIVISION

National Curriculum requirements:

To recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

To write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.

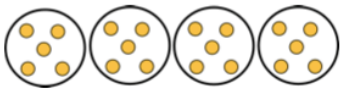
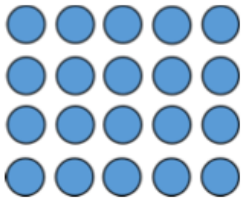
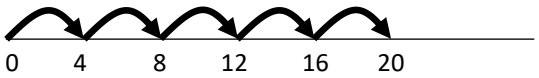
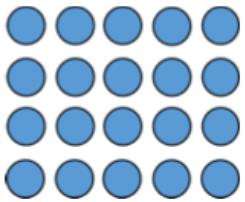
To solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

St Thomas More Catholic Primary School Calculation Policy

Operation: Multiplication

Skill: To multiply 2 digit numbers by 1 digit numbers, e.g. 32 x 3 = 96.

Please note: Children build up to multiplying 2 digit by 1 digit numbers. They explore methods of multiplying 1 digit numbers first.

Concrete	Pictorial	Abstract
Continue to represent multiplication as repeated addition in a variety of ways. Numicon  Bead strings/ Rekenreks  Counters  Make arrays using objects 	Showing equal jumps of repeated addition on a blank numberline  Drawing arrays 	Written calculation using repeated addition and multiplication sentences 5 + 5 + 5 + 5 = 20 20 = 5 + 5 + 5 + 5 4 x 5 = 20 20 = 4 x 5 5 x 4 = 20 20 = 5 x 4 Counting aloud in steps, focusing on 3s, 4s and 8s e.g. 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36. Mental recall of doubles Grid method 32 x 3 = 96 30 2 X | **30** | **2** **3** | 90 | 6 90 + 6 = 96

Grid method using place value counters or dienes

32 x 3 = 96

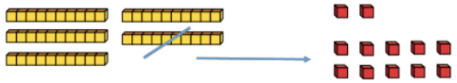
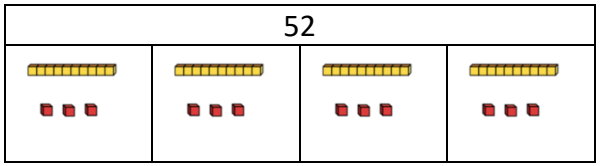
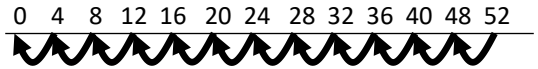
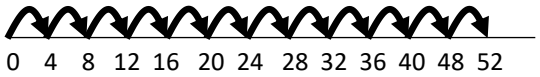
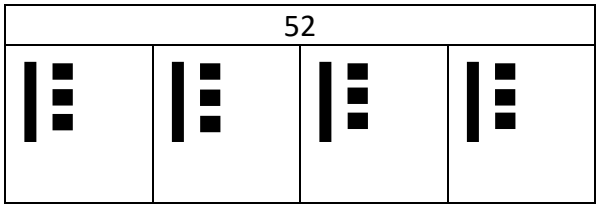
30 2

X	**30**	**2**	
3			
	90	6	= 96

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To divide a 2 digit number by a 1 digit number, e.g. 52 ÷ 4 = 13.

Concrete	Pictorial	Abstract
Children can represent division by sharing amounts into equal groups or by grouping and then counting the number of groups using Numicon, bead strings, tens frames, dienes or place value counters. When needed, children exchange one ten for ten ones in order to divide equally.   	Showing equal jumps of repeated subtraction on a blank number line  Or grouping using a blank number line  Using a bar model or part whole model with jottings  	Written calculations including linking between multiplication and division 52 ÷ 13 = 4 4 = 52 ÷ 13 52 ÷ 4 = 13 13 = 52 ÷ 4 13 x 4 = 52 52 = 13 x 4 4 x 13 = 52 52 = 4 x 13

YEAR 4 – MULTIPLICATION AND DIVISION

National Curriculum requirements:

To recall multiplication and division facts for multiplication tables up to 12 × 12.

To 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.

To recognise and use factor pairs and commutativity in mental calculations.

To multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

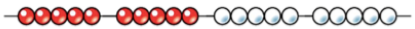
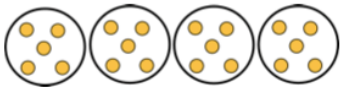
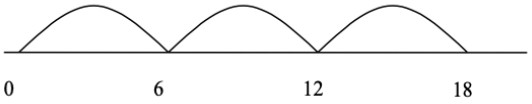
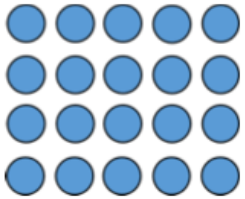
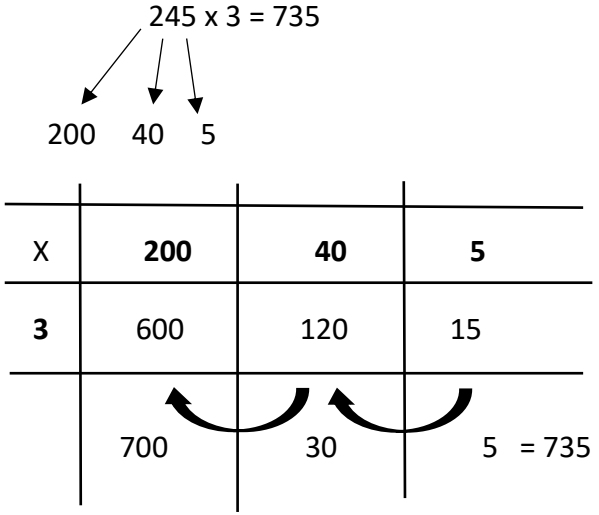
To solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

St Thomas More Catholic Primary School Calculation Policy

Operation: Multiplication

Skill: To multiply 3 digit numbers by 1 digit numbers, e.g. 245 x 3 = 735.

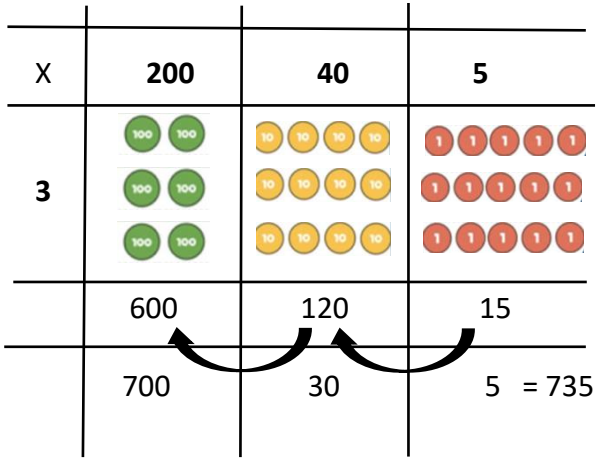
Please note: Children build up to multiplying 2 digit by 1 digit numbers. They explore methods of multiplying 1 digit numbers first.

Concrete	Pictorial	Abstract
Continue to represent multiplication as repeated addition in a variety of ways. Numicon  Bead strings/ Rekenreks  Counters 	Showing equal jumps of repeated addition on a blank numberline  Drawing arrays 	Written calculation using repeated addition and multiplication sentences 5 + 5 + 5 + 5 = 20 20 = 5 + 5 + 5 + 5 4 x 5 = 20 20 = 4 x 5 5 x 4 = 20 20 = 5 x 4 Grid method 

Grid method using place value counters or dienes

245 x 3 = 735

200 40 5



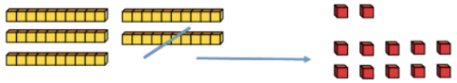
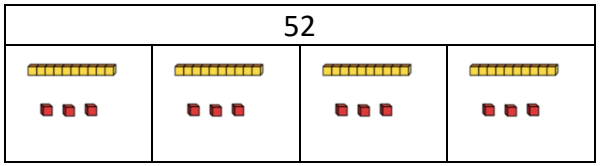
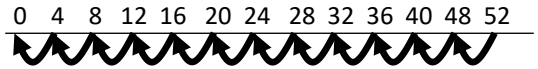
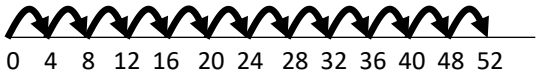
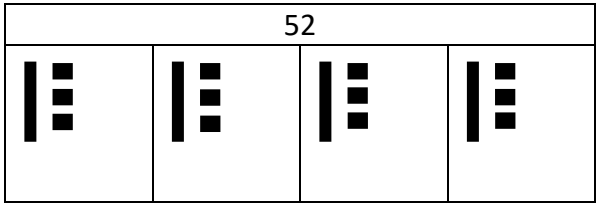
Moving to a written method of multiplication

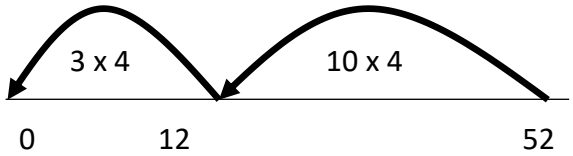
	H	T	O
	2	4	5
X			3
		1	5
	1	2	0
	6	0	0
	7	3	5

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To divide a 2 digit number by a 1 digit number, e.g. 52 ÷ 4 = 13 or including a remainder such as 53 ÷ 4 = 13 r1.

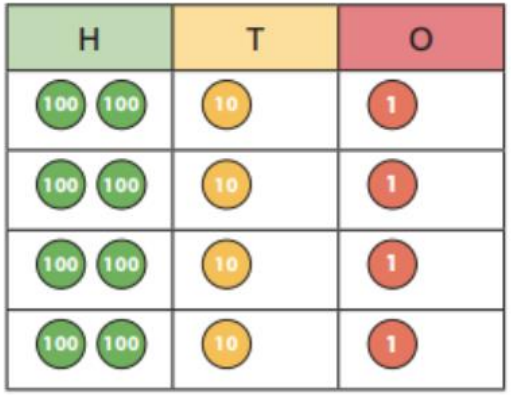
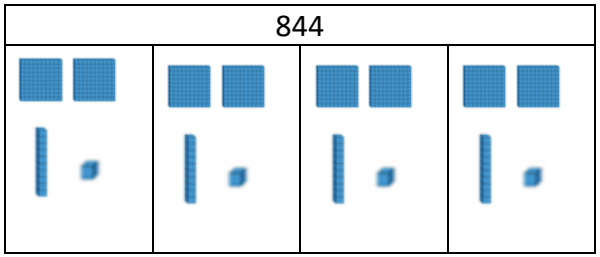
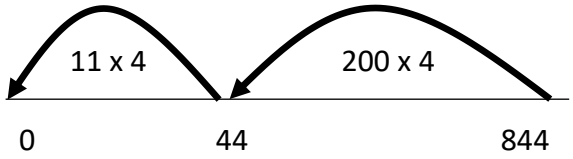
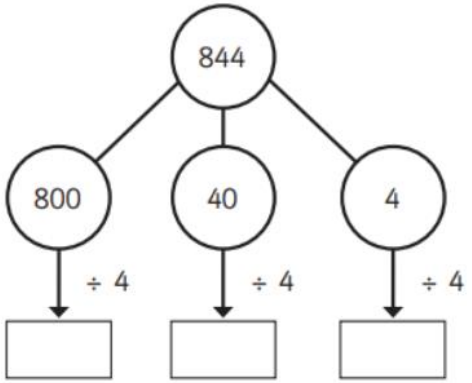
Concrete	Pictorial	Abstract
Children can represent division by sharing amounts into equal groups or by grouping and then counting the number of groups using Numicon, bead strings, tens frames, dienes or place value counters. When needed, children exchange one ten for ten ones in order to divide equally.   	Showing equal jumps of repeated subtraction on a blank number line, e.g. 52 ÷ 4 = 13.  Or grouping using a blank number line  Using a bar model or part whole model with jottings  	Written calculations including linking between multiplication and division 52 ÷ 13 = 4 4 = 52 ÷ 13 52 ÷ 4 = 13 13 = 52 ÷ 4 13 x 4 = 52 52 = 13 x 4 4 x 13 = 52 52 = 4 x 13 Chunking method 13 4 | 52 - 40 (10 x 4) 12 - 12 (3 x 4) 0

	Chunking on a numberline  13 x 4 = 52 52 ÷ 4 = 13	

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To divide a 3 digit number by a 1 digit number, e.g. 844 ÷ 4 = 211.

Concrete	Pictorial	Abstract
Children can represent division by sharing amounts into equal groups or by grouping and then counting the number of groups using dienes or place value counters. When needed, children exchange one ten for ten ones in order to divide equally.  	Using a bar model or part whole model with jottings  Chunking on a numberline  211 x 4 = 844 844 ÷ 4 = 211	Written calculations including linking between multiplication and division 844 ÷ 4 = 211 211 = 844 ÷ 4 844 ÷ 211 = 4 4 = 844 ÷ 211 4 x 211 = 844 844 = 4 x 211 211 x 4 = 844 844 = 211 x 4 Part whole models/ bar models 

		Chunking method 211 4 ⟌ 844 - 800 (200 x 4) 44 - 44 (11 x 4) 0

YEAR 5 – MULTIPLICATION AND DIVISION

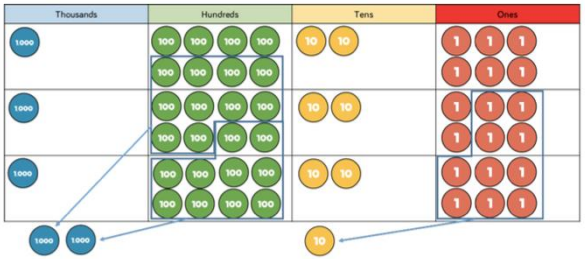
National Curriculum requirements:

To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
To know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers.
To establish whether a number up to 100 is prime and recall prime numbers up to 19.
To 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.
To multiply and divide numbers mentally drawing upon known facts.
To 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.
To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
To recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).
To solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.
To solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

St Thomas More Catholic Primary School Calculation Policy

Operation: Multiplication

Skill: To multiply 4 digit numbers by 1 digit numbers, e.g. 1826 x 3 = 5478.

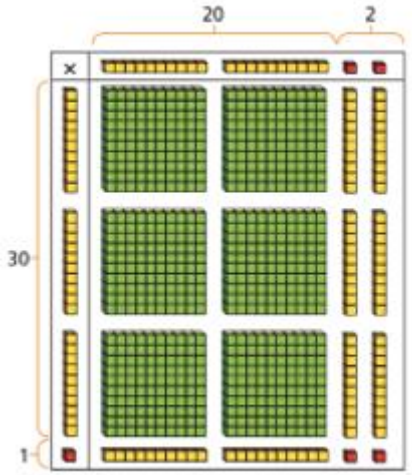
Concrete	Pictorial	Abstract
Grid method using place value counters or dienes 	As concrete but representing place value counters or dienes as jottings.	Short written method of multiplication Th H T O 1 8 2 6 X 3 5 4 7 8 2 1

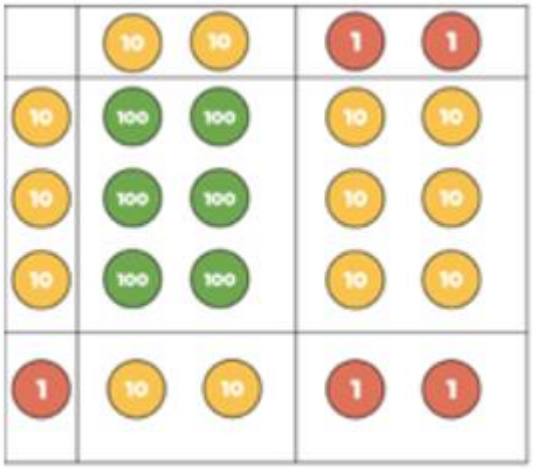
St Thomas More Catholic Primary School Calculation Policy

Operation: Multiplication

Skill: To multiply 2 digit numbers by 2 digit numbers, e.g. 22 x 31 = 682.

Concrete	Pictorial	Abstract
Representing multiplication using place value counters or dienes	As concrete but representing place value counters or dienes as jottings.	Grid method for multiplication





X	20	2
30	600	60
1	20	2

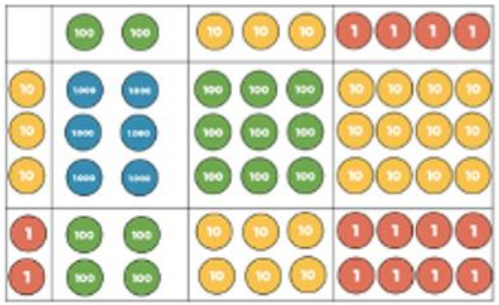
Short written method of multiplication

	H	T	O
		2	2
X		3	1
		2	2
+	6	6	0
	6	8	2

St Thomas More Catholic Primary School Calculation Policy

Operation: Multiplication

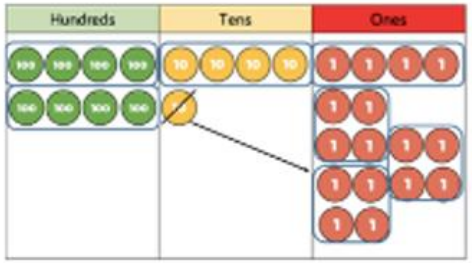
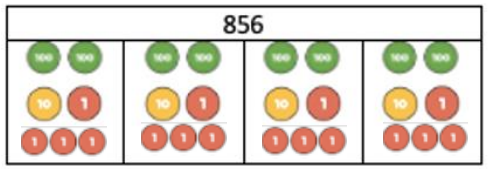
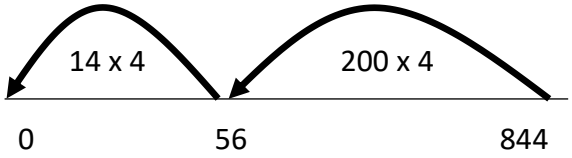
Skill: To multiply 3 or 4 digit numbers by 2 digit numbers, e.g. 234 x 32 = 7488.

<table>
<tr><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Representing multiplication using place value counters or dienes
  </td>
<td>As concrete but representing place value counters or dienes as jottings.</td>
<td>Grid method for multiplication
<table>
<tr><td>X</td><td>200</td><td>30</td><td>4</td></tr>
<tr><td>30</td><td>6000</td><td>900</td><td>120</td></tr>
<tr><td>2</td><td>400</td><td>60</td><td>8</td></tr>
</table>
Short written method of multiplication
<table>
<tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td></td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>X</td><td></td><td></td><td>3</td><td>2</td></tr>
<tr><td></td><td></td><td>4</td><td>6</td><td>8</td></tr>
<tr><td>+</td><td>7</td><td>0</td><td>2</td><td>0</td></tr>
<tr><td></td><td>1</td><td>1</td><td></td><td></td></tr>
<tr><td></td><td>7</td><td>4</td><td>8</td><td>8</td></tr>
</table>
</td>
</tr>
</table>

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

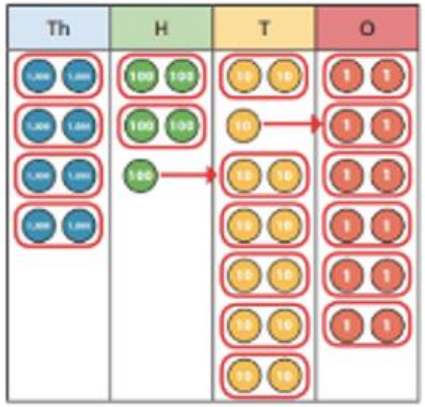
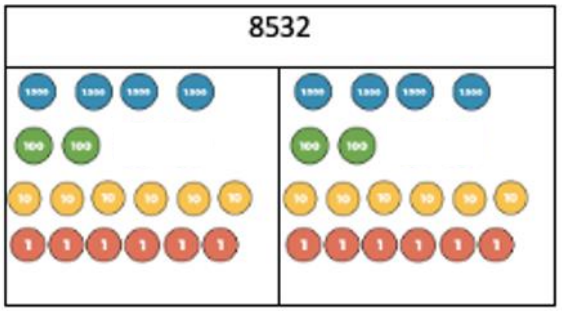
Skill: To divide a 3 digit number by a 1 digit number, e.g. 856 ÷ 4 = 214.

Concrete	Pictorial	Abstract
Representing division using place value counters or dienes to group equally. 	Bar model or part whole models using dienes or place value jottings.  Chunking on a numberline  214 x 4 = 856 856 ÷ 4 = 214	Chunking method 214 4 | 856 - 800 (200 x 4) 56 - 56 (14 x 4) 0 Short division 2 1 4 4 | 8 5 ^{1}6

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To divide a 4 digit number by a 1 digit number, e.g. 8532 ÷ 2 = 4266.

Concrete	Pictorial	Abstract
Representing division using place value counters or dienes to group equally. 	Bar model or part whole models using dienes or place value jottings. 	Short division $\begin{array}{r\|l} & 4\ 2\ 6\ 6 \\ \hline 2 & 8\ 5\ {}^{1}3\ {}^{1}2 \end{array}$

YEAR 6 – MULTIPLICATION AND DIVISION

National Curriculum requirements:

To multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
To 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, or by rounding, as appropriate for the context.
To 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.
To perform mental calculations, including with mixed operations and large numbers.
To identify common factors, common multiples and prime numbers.
To use their knowledge of the order of operations to carry out calculations involving the four operations.
To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

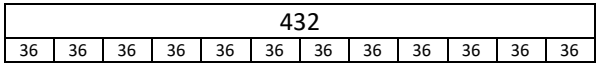
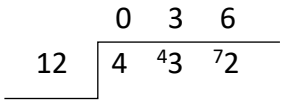
Operation: Multiplication
Skill: To multiply 4 digit numbers by 2 digit numbers, e.g. 2739 x 28 = 76692.

Concrete	Pictorial	Abstract
Representing multiplication using place value counters or dienes.	As concrete, but representing place value counters or dienes using jottings. Bar model or part whole models using dienes or place value jottings.	Written method of multiplication TTh Th H T O 2 7 3 9 X 2 8 2 1 9 1 2 2 5 3 7 + 5 4 7 8 0 1 1 7 6 6 9 2 1

St Thomas More Catholic Primary School Calculation Policy

Operation: Division

Skill: To divide a multi digit number by a 2 digit number, e.g. 432 ÷ 12 = 36.

Concrete	Pictorial	Abstract
Representing division using place value counters or dienes to group equally.	Bar model or part whole models using dienes or place value jottings.  	Short division  Long division