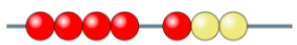
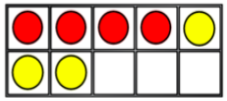
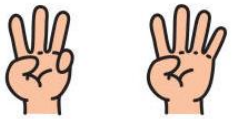
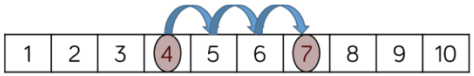
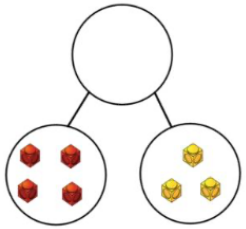
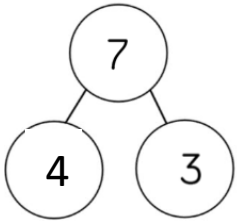
St Thomas More Catholic Primary School Calculation Policy

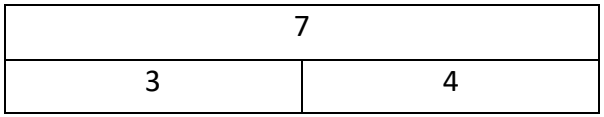
YEAR 1 – ADDITION AND SUBTRACTION

National Curriculum requirements:
To read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
To represent and use number bonds and related subtraction facts within 20
To add and subtract one-digit and two-digit numbers to 20, including zero
To solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9.

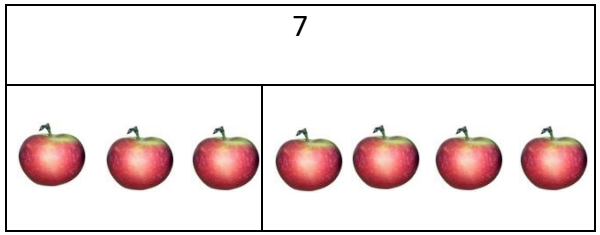
Operation: Addition
Skill: To add two 1 digit numbers to 10, e.g. 4 + 3 = 7.

<table>
<tr><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Numicon
 
Bead strings/ Rekenreks
 
Multilink cubes
 
Tens frames - fill each row before starting the next
 
Fingers
  </td>
<td>Number tracks – start with the largest number and then count on
 

Part whole models with drawings/ pictures
  </td>
<td>Part whole model
 

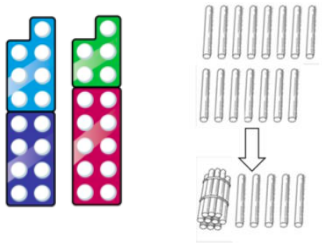
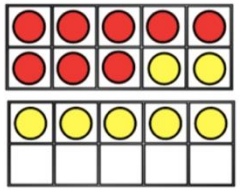
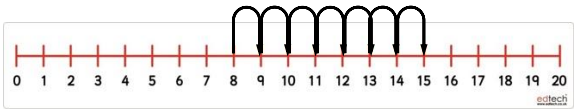
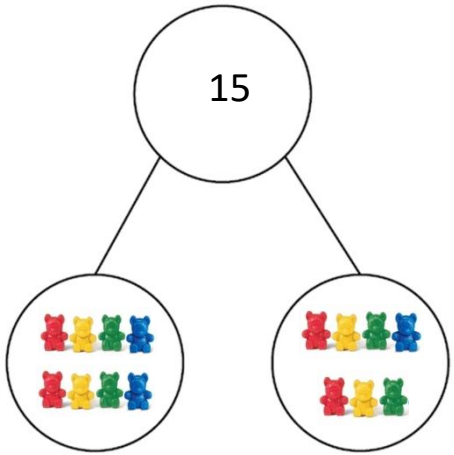
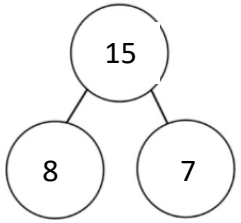
Bar model
 

Written calculations
4 + 3 = 7
3 + 4 = 7
7 = 4 + 3
7 = 3 + 4</td>
</tr>
</table>

	Bar models with drawings/ pictures 	Mental calculations – put the larger number in your head and then count on Stem sentences to emphasise language ‘3 more than 4 is equal to 7’ ‘4 add 3 is equal to 7’

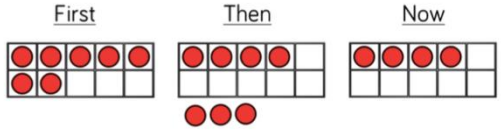
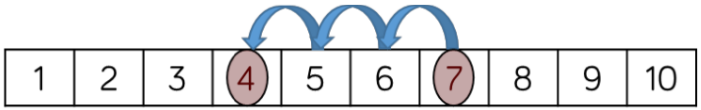
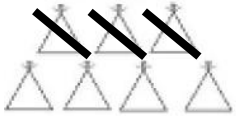
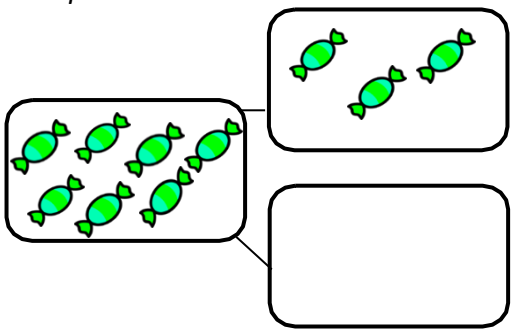
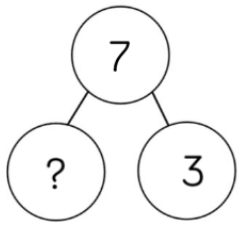
St Thomas More Catholic Primary School Calculation Policy

Operation: Addition
Skill: To add 1 and 2 digit numbers to 20, e.g. 8 + 7 = 15.

Concrete	Pictorial	Abstract
Numicon/ lollipop sticks/ egg boxes – adding 2 numbers then regrouping to highlight that 10 ones equals 1 ten  Tens frames – adding 2 numbers by making 10 first (fill the first tens frame before starting the second)  Multilink 	Number lines – start with the largest number and then count on  Part whole models with drawings/ pictures  Bar models with drawings/ pictures	Part whole model  Bar model 15 8 | 7 Written calculations – applying fact families 8 + 7 = 15 15 = 8 + 7 7 + 8 = 15 15 = 7 + 8 Stem sentences to emphasise language ‘7 more than 8 is equal to 15’ ‘8 plus 7 is equal to 15’

St Thomas More Catholic Primary School Calculation Policy

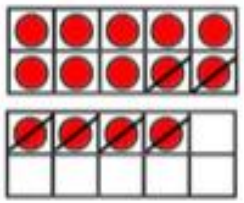
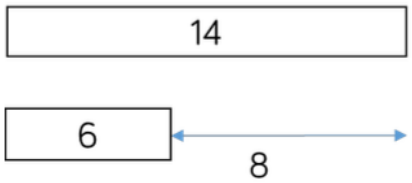
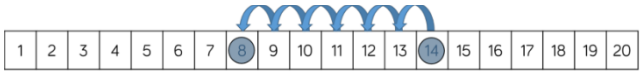
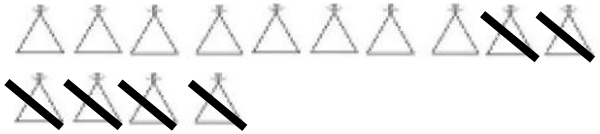
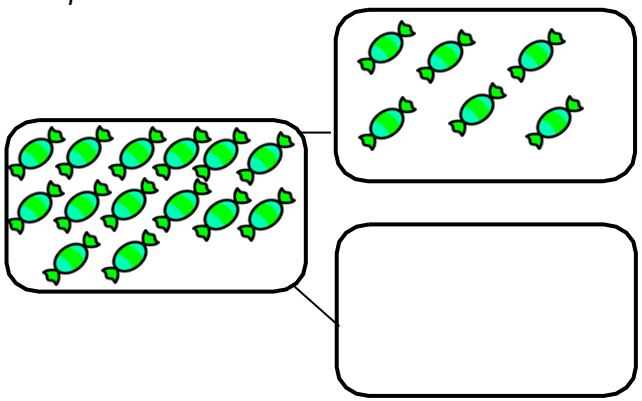
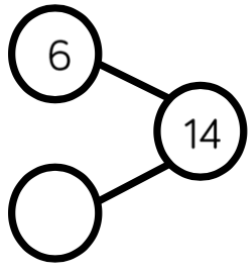
Operation: Subtraction
Skill: To subtract 1 digit numbers within 10, e.g. 7 – 3 = 4.

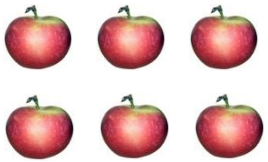
Concrete	Pictorial	Abstract
Using physical objects to show how objects can be taken away, e.g. counters, cubes, teddy bears, toys. Tell number stories using first, then and now with concrete manipulatives.  Finding the difference by comparing objects and amounts 	Number tracks – start with the largest number and then count back  Cross out drawn objects to show what has been taken away  Part whole models with drawings/ pictures to find the other part. *This can be made concrete by using manipulatives.* 	Written calculations 7 – 3 = 4 4 = 7 - 3 7 – 4 = 3 3 = 7 – 4 Missing number calculations, e.g. 7 - ☐ = 4 ☐ = 7 - 3 Mental calculations – put the larger number in your head and then count backwards Finding the difference by comparing 'Hannah has 7 sweets and her sister has 3. How many more sweets does Hannah have than her sister?' Part whole model 

	Bar models with drawings/ pictures to find the missing part. *This can be made concrete by using manipulatives.* 7 ?	Bar model – applying fact families 7 3 | 4 3 + 4 = 7 4 + 3 = 7 7 = 3 + 4 7 = 4 + 3 7 – 3 = 4 7 – 4 = 3 4 = 7 - 3 3 = 7 - 4

St Thomas More Catholic Primary School Calculation Policy

Operation: Subtraction
Skill: To subtract 1 and 2 digit numbers within 20, e.g. 14 – 6 = 8.

Concrete	Pictorial	Abstract
Using physical objects to show how objects can be taken away, e.g. counters, cubes, teddy bears, toys.  Subtract using concrete manipulatives and tens frames.  Finding the difference by comparing objects and amounts 	Number tracks – start with the largest number and then count back  Cross out drawn objects to show what has been taken away  Part whole models with drawings/ pictures to find the other part. *This can be made concrete by using manipulatives.* 	Written calculations 14 – 6 = 8 8 = 14 - 6 14 – 8 = 6 6 = 14 – 8 Missing number calculations 14 - ☐ = 6 ☐ = 14 - 8 Mental calculations – put the larger number in your head and then count backwards Finding the difference by comparing ‘Hannah has 14 sweets and her sister has 6. How many more sweets does Hannah have than her sister?’ Part whole model 

	Bar models with drawings/ pictures to find the missing part. *This can be made concrete by using manipulatives.* 14 ? 	Bar model – applying fact families 14 6 | 8 14 – 6 = 8 14 – 8 = 6 8 = 14 -6 6 = 14 - 8

YEAR 2 ADDITION AND SUBTRACTION

National Curriculum requirements:

To solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures

To apply their increasing knowledge of mental and written methods

To recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

To add and subtract numbers using concrete objects, pictorial representations, and mentally, including:

- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers

To show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot

To recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

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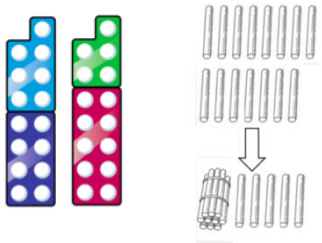
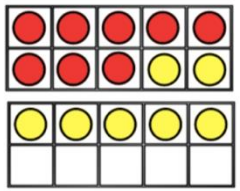
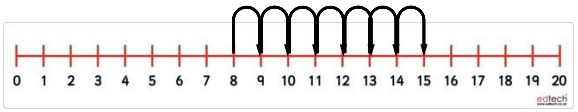
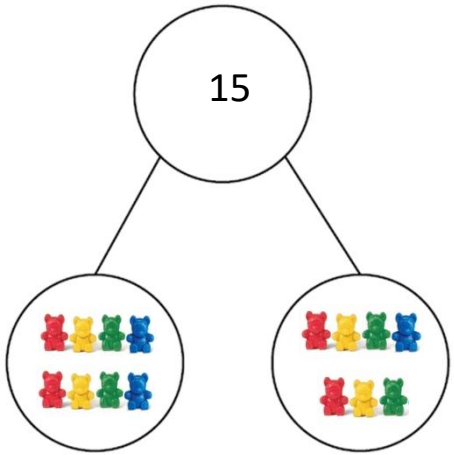
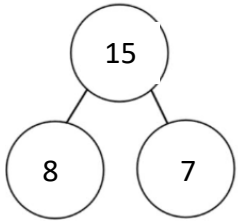
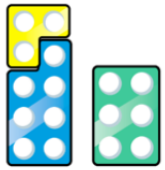
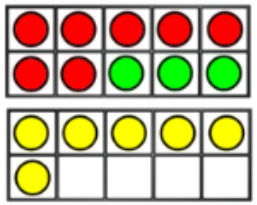
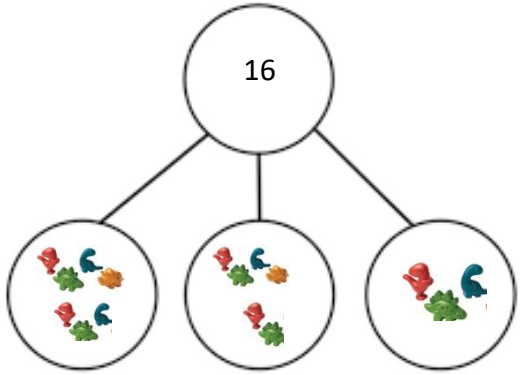
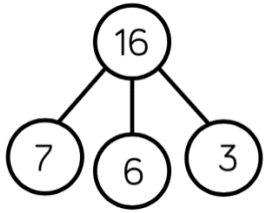
Operation: Addition
Skill: To add 1 and 2 digit numbers to 20, e.g. 8 + 7 = 15.

Concrete	Pictorial	Abstract
Numicon/ lollipop sticks/ egg boxes – adding 2 numbers then regrouping to highlight that 10 ones equals 1 ten  Tens frames – adding 2 numbers by making 10 first (fill the first tens frame before starting the second)  Multilink 	Number lines – start with the largest number and then count on  Part whole models with drawings/ pictures  Bar models with drawings/ pictures	Part whole model  Bar model 15 8 | 7 Written calculations – applying fact families 8 + 7 = 15 15 = 8 + 7 7 + 8 = 15 15 = 7 + 8 Stem sentences to emphasise language ‘7 more than 8 is equal to 15’ ‘8 plus 7 is equal to 15’

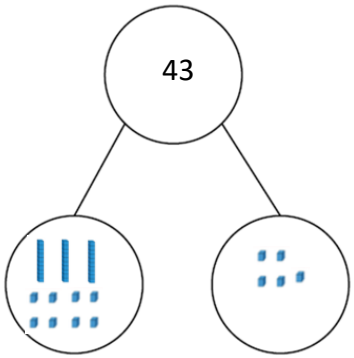
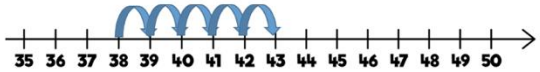
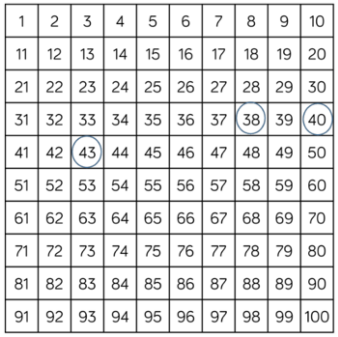
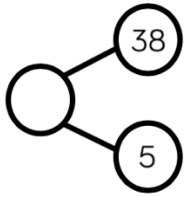
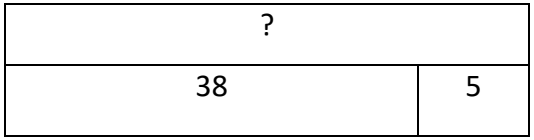
St Thomas More Catholic Primary School Calculation Policy

Operation: Addition
Skill: To add three 1 digit numbers, e.g. 7 + 6 + 3 = 16.

Concrete	Pictorial	Abstract
Numicon/ lollipop sticks/ egg boxes/ multilink – adding 3 numbers together, focusing on number bonds first  Tens frames – adding 3 numbers by making 10 first (fill the first tens frame before starting the second) 	Number lines – start with the largest number and then count on using the next largest. Repeat for the final number. Part whole models with drawings/ pictures  Bar models with drawings/ pictures	Part whole model  Bar model 16 / 7 | 6 | 3 Written calculations showing commutativity 7 + 6 + 3 = 13 7 + 3 + 6 = 13 6 + 3 + 7 = 13 6 + 7 + 3 = 13 3 + 6 + 7 = 13 3 + 7 + 6 = 13

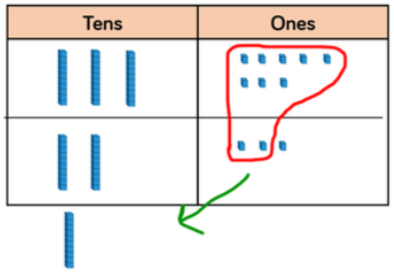
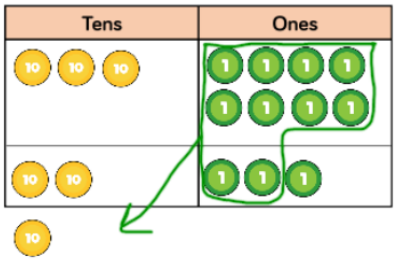
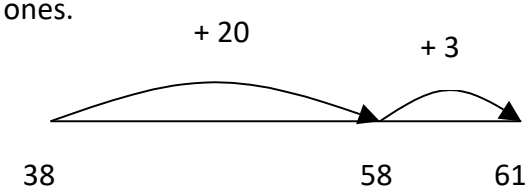
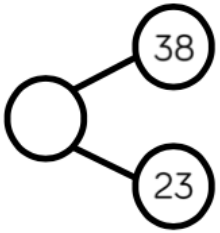
St Thomas More Catholic Primary School Calculation Policy

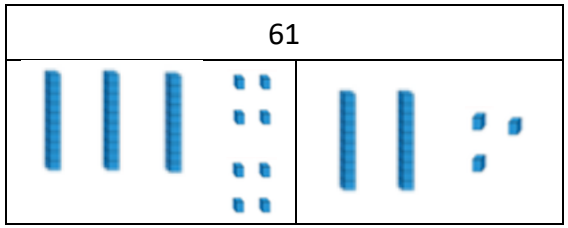
Operation: Addition
Skill: To add 1 digit and 2 digit numbers to 100, e.g. 38 + 5 = 43.

Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters – start by making the largest number then make the second number. Add the two together by combining the ones first then the tens. Part whole models/ bar models using manipulatives 	Number lines – start with the largest number and then count on.  Hundred squares – start with the largest number and then count on in ones (horizontally).  Part whole models with drawings/ pictures Bar models with drawings/ pictures	Part whole model  Bar model  Written calculations – applying fact families 38 + 5 = 43 43 = 38 + 5 5 + 38 = 43 43 = 5 + 38

St Thomas More Catholic Primary School Calculation Policy

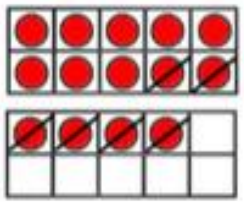
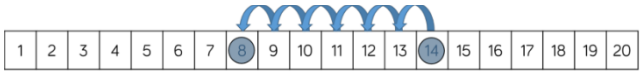
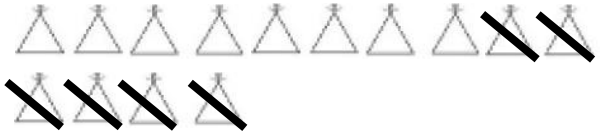
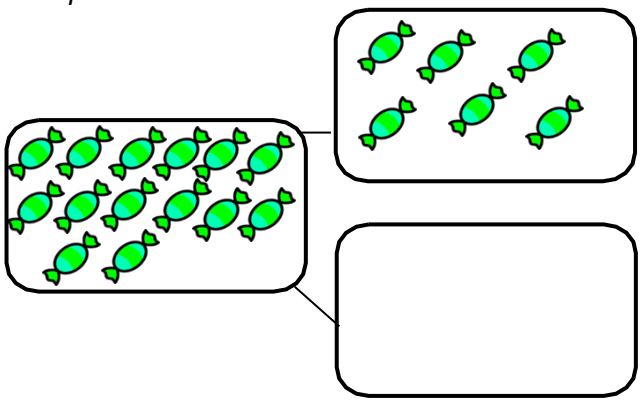
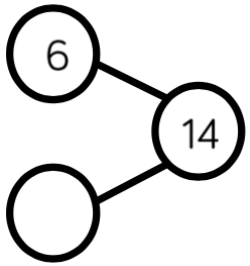
Operation: Addition
Skill: To add two 2 digit numbers to 100, e.g. 38 + 23 = 61.

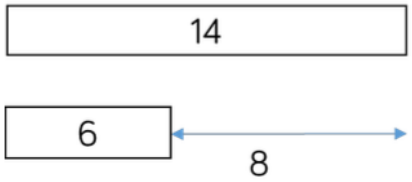
Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters – start by making the largest number then make the second number. Add the two together by combining the ones first and then the tens. If the ones column totals more than 9, exchange ten ones for one ten before recombining to find the answer.   	Hundred squares – start with the largest number and then count on in tens (vertically) and then count on in ones (horizontally). 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 Blank number lines – start with the largest number and then add the tens and then the ones.  	Part whole model  Bar model 61 38 23 Written calculations - applying fact families 38 + 23 = 61 61 = 38 + 23 23 + 38 = 61 61 = 23 + 38

Part whole models/ bar models using manipulatives	Bar models or part whole models with drawings/ jottings  *This can be made concrete by using manipulatives.*	Expanded column method 38 + 23 = 61 30 8 + 20 3 50 11 60 1 Exchange the ten ones for one ten

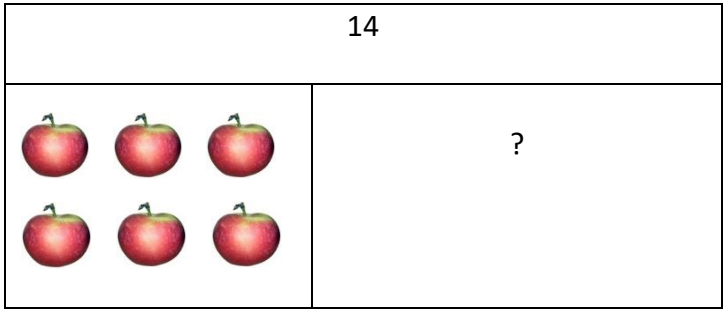
St Thomas More Catholic Primary School Calculation Policy

Operation: Subtraction
Skill: To subtract 1 and 2 digit numbers within 20, e.g. 14 – 6 = 8.

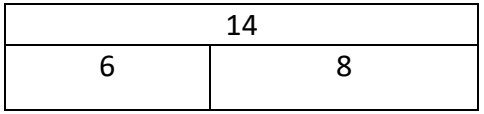
Concrete	Pictorial	Abstract
Using physical objects to show how objects can be taken away, e.g. counters, cubes, teddy bears, toys.  Subtract using concrete manipulatives and tens frames.  Numicon – using shapes and pegs to solve subtraction sentences by taking away. Finding the difference by comparing objects and amounts	Number lines – start with the largest number and then count back  Cross out drawn objects to show what has been taken away  Part whole models with drawings/ pictures to find the other part. *This can be made concrete by using manipulatives.* 	Written calculations 14 – 6 = 8 8 = 14 - 6 14 – 8 = 6 6 = 14 – 8 Missing number calculations 14 - ☐ = 6 ☐ = 14 - 8 Mental calculations – put the larger number in your head and then count backwards Finding the difference by comparing ‘Hannah has 14 sweets and her sister has 6. How many more sweets does Hannah have than her sister?’ Part whole model 



Bar models with drawings/ pictures to find the missing part. *This can be made concrete by using manipulatives.*



Bar model – applying fact families

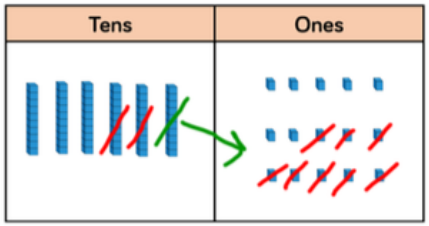
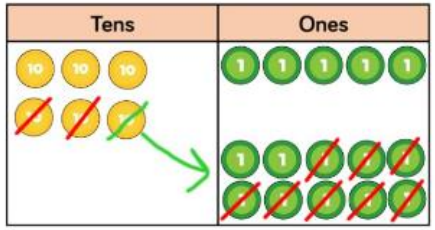
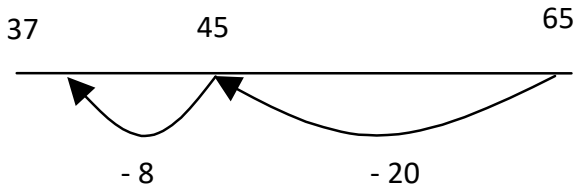
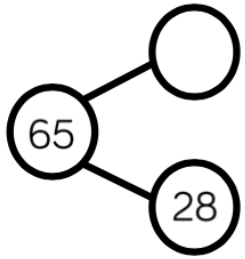


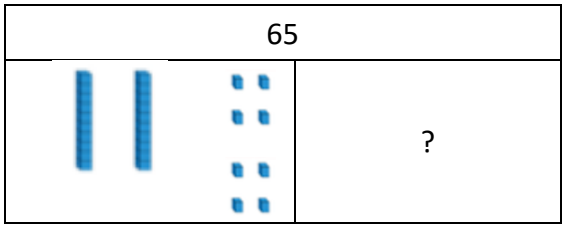
6 + 8 = 14
8 + 6 = 14
14 – 6 = 8
14 – 8 = 6

14 = 6 + 8
14 = 8 + 6
8 = 14 - 6
6 = 14 - 8

St Thomas More Catholic Primary School Calculation Policy

Operation: Subtraction
Skill: To subtract 1 and 2 digit numbers to 100, e.g. 65 – 28 = 37.

Concrete	Pictorial	Abstract
Using manipulatives to show how objects can be taken away, e.g. dienes, place value counters. Make the largest whole number and take away the smaller number. If crossing a 10, exchange one ten for ten ones before subtracting.   Finding the difference by comparing objects and amount	Hundred squares – start with the largest number and then count backwards in tens (vertically) and then backwards in ones (horizontally). 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 Blank number lines – start with the largest number and then subtract the tens and then the ones.  	Written calculations 65 – 28 = 37 65 – 37 = 28 37 = 65 – 28 28 = 65 - 37 Part whole model  Bar model – applying fact families 65 28 | 37 65 – 28 = 37 65 – 37 = 28 37 = 65 - 28 28 = 65 – 37 28 + 37 = 65 37 + 28 = 65 65 = 28 + 37 65 = 37 + 28 Expanded column method

	Bar models or part whole models with drawings/ pictures to find the other part.  *This can be made concrete by using manipulatives.*	65 – 28 = 37 50 ~~60~~ 15 - 20 8 30 7 Exchange one ten for ten ones

YEAR 3 ADDITION AND SUBTRACTION

National Curriculum requirements:

To add and subtract numbers mentally, including

- a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds

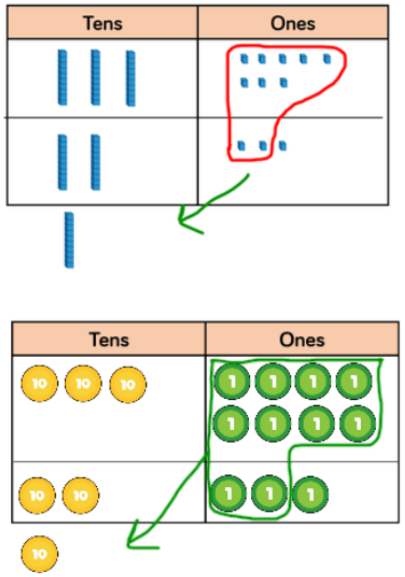
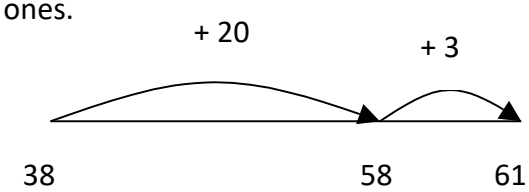
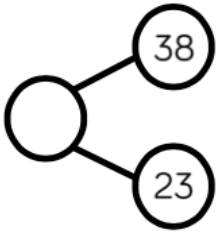
To add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

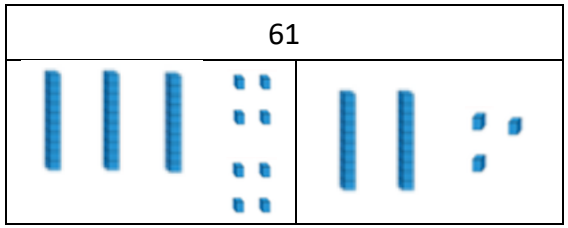
To estimate the answer to a calculation and use inverse operations to check answers

To solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

St Thomas More Catholic Primary School Calculation Policy

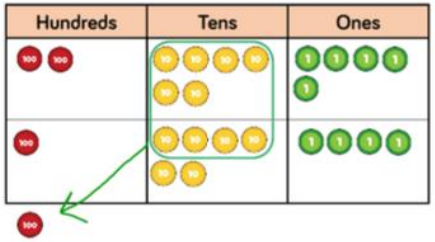
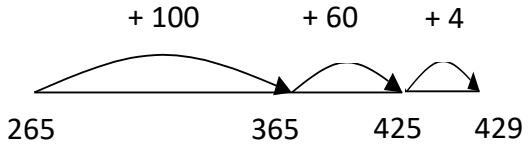
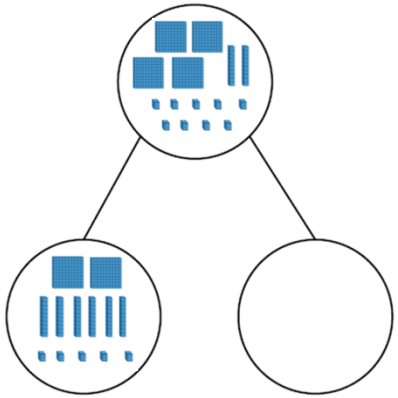
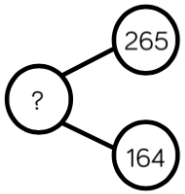
Operation: Addition
Skill: To add two 2 digit numbers to 100, e.g. 38 + 23 = 61.

Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters – start by making the largest number then make the second number. Add the two together by combining the ones first and then the tens. If the ones column totals more than 9, exchange ten ones for one ten before recombining to find the answer. 	Hundred squares – start with the largest number and then count on in tens (vertically) and then count on in ones (horizontally). 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 Blank number lines – start with the largest number and then add the tens and then the ones. 	Part whole model  Bar model 61 38 23 Written calculations - applying fact families 38 + 23 = 61 61 = 38 + 23 23 + 38 = 61 61 = 23 + 38

Part whole models/ bar models using manipulatives	Bar models or part whole models with drawings/ jottings  *This can be made concrete by using manipulatives.*	Expanded column method 38 + 23 = 61 30 8 + 20 3 50 11 60 1 Exchange the ten ones for one ten

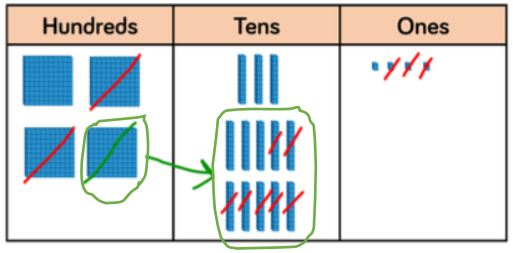
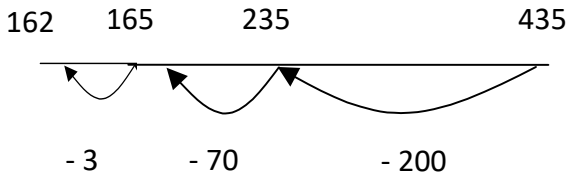
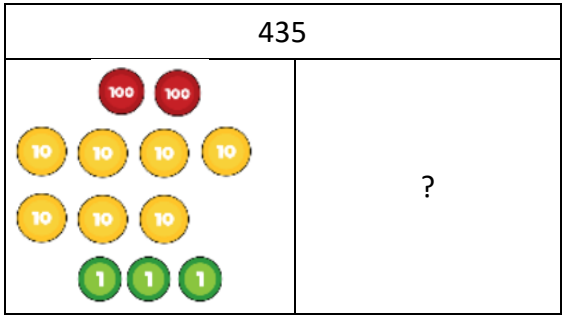
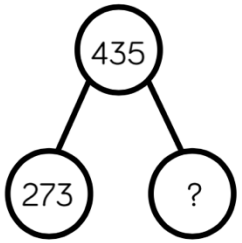
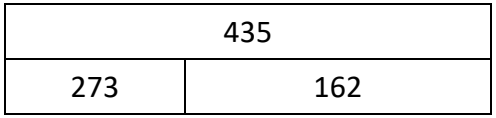
St Thomas More Catholic Primary School Calculation Policy

Operation: Addition
Skill: To add numbers with up to 3 digits, e.g. 265 + 164 = 429.

Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters to model the process of adding and exchanging, where necessary, during column addition. Add the two together by combining the ones, then the tens and then the hundreds. If the column totals more than 9, exchange 10 (ones, tens, hundreds) for 1 (ten, hundred, thousand) before recombining to find the answer. 	Blank number lines – start with the largest number and then add the tens and then the ones.  Bar models or part whole models with drawings/ jottings.  *This can be made concrete by using manipulatives.*	Part whole model  Bar model 429 265 | 164 Written calculations - applying fact families 265 + 164 = 429 164 + 265 = 429 429 – 164 = 265 429 – 265 = 164 Expanded column method

		200 60 5 + 100 60 4 300 120 9 400 20 9 = 429

Operation: Subtraction
Skill: To subtract with up to 3 digits, e.g. 435 – 273 = 162.

Concrete	Pictorial	Abstract
Using manipulatives to show how objects can be taken away, e.g. dienes, place value counters. Make the largest whole number and take away the smaller number. If crossing over place value columns, exchange one ten for ten ones or one hundred for ten tens before subtracting. 	Blank number lines – start with the largest number and then subtract the tens and then the ones.  Part whole models with jottings to find the other part. 	Part whole model  Bar model – applying fact families  435 – 273 = 162 435 – 162 = 273 273 + 162 = 435 162 + 273 = 435 162 = 435 - 273 273 = 435 - 162 435 = 273 + 162 435 = 162 + 273

		Expanded column method 300 130 Exchange 1 ~~400~~ ~~30~~ 5 hundred for - 200 70 3 10 tens 100 60 2

YEAR 4 ADDITION AND SUBTRACTION

National Curriculum requirements:

To add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction

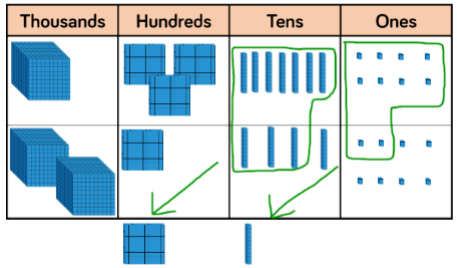
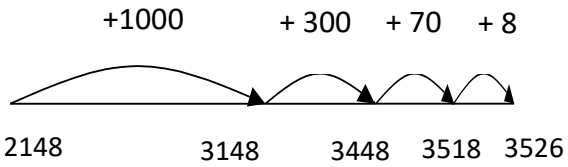
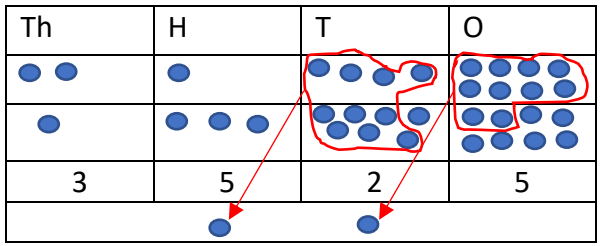
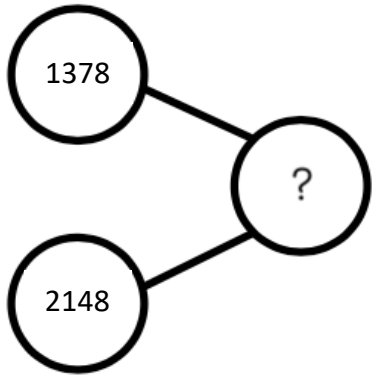
To estimate and use inverse operations to check answers to a calculation

To solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Operation: Addition

Skill: To add numbers with up to 4 digits e.g. 2148 +1378 = 3526

Please note: Children build up to 4 digit numbers. They explore methods using 2 and 3 digit numbers first.

Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters to model the process of adding and exchanging, where necessary, during column addition. Add the two numbers together by combining the ones, then the tens, then the hundreds and then the thousands. If the column totals more than 9, exchange 10 (ones, tens, hundreds, thousands) for 1 (ten, hundred, thousand, ten thousand) before recombining to find the answer. 	Blank number lines – start with the largest number and then add the tens and then the ones.  Bar models or part whole models with drawings/ jottings. Draw representations using place value (PV) grid.  Use digit cards using PV grid	Part whole model  Bar model 3526 2148 | 1378 Written calculations - applying fact families 2148 + 1378 = 3526 3526 = 2148 + 1378 1378 + 2148 = 3526 3526 = 1378 + 2148

		Expanded column method 2000 100 40 8 + 1000 300 70 8 3000 400 110 16 3000 500 20 6 3000 + 500 + 20 + 6 = 3526 Moving to column method (condensed) 2148 + 1378 3526 1 1

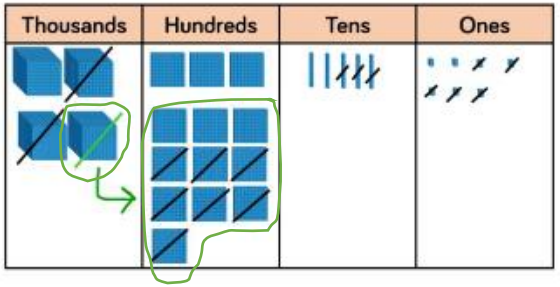
Operation: Subtraction

Skill: To subtract with up to 4 digits, e.g. 4357 – 2735 = 1622.

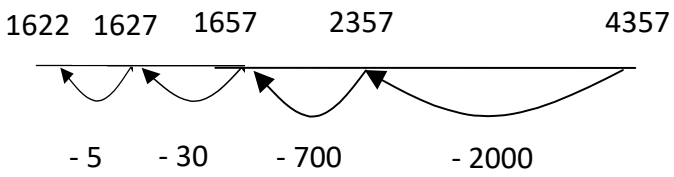
Please note: Children build up to 4 digit numbers. They explore methods using 2 and 3 digit numbers first.

<table>
<tr><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>
Using manipulatives to show how objects can be taken away, e.g. dienes, place value counters. Make the largest whole number and take away the smaller number.

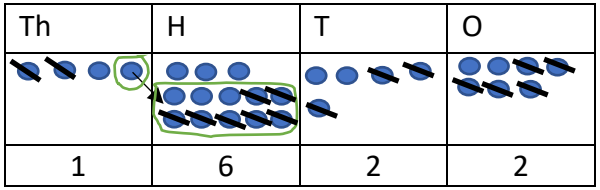
If crossing over place value columns, exchange one ten for ten ones, one hundred for ten tens or one thousand for ten hundreds before subtracting.



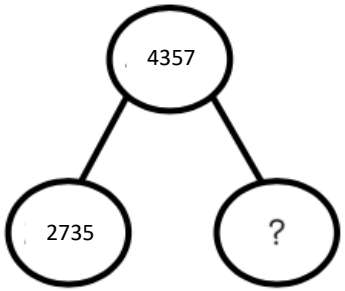
</td>
<td>
Blank number lines – start with the largest number and then subtract the tens and then the ones.



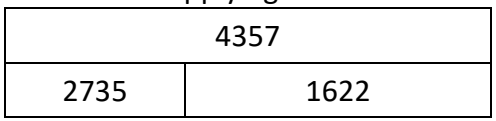
Draw representations using place value (PV) grid.



4357 – 2735 = 1622
</td>
<td>
Part whole model



Bar model – applying fact families



4357 – 2735 = 1622
4357 – 1622 = 2735
1622 = 4357 – 2735
2735 = 4357 – 1622

2735 + 1622 = 4357
1622 + 2735 = 4357
4357 = 2735 + 1622
4357 = 1622 + 2735
</td>
</tr>
</table>

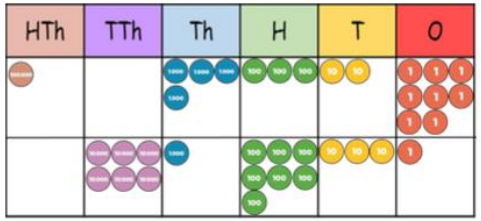
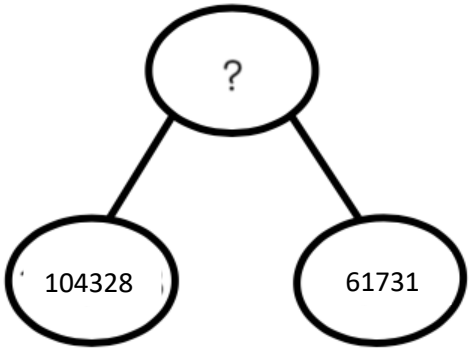
		Expanded column method 3000 1300 ~~4000~~ ~~300~~ 50 7 - 2000 700 30 5 1000 600 20 2 Exchange 1 thousand for 10 hundreds 1000 + 600 + 20 + 2 = 1622 Moving to column method (condensed) 3 13 ~~4~~ ~~3~~57 - 2735 1622

YEAR 5 ADDITION AND SUBTRACTION

National Curriculum requirements:

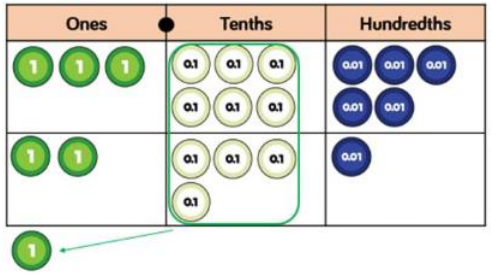
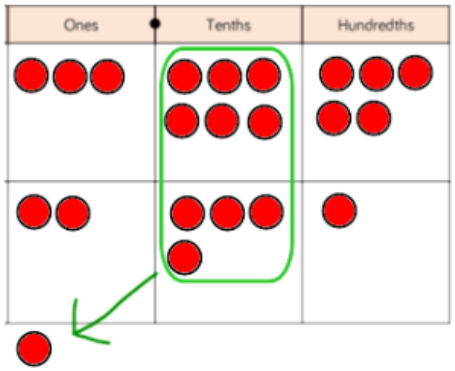
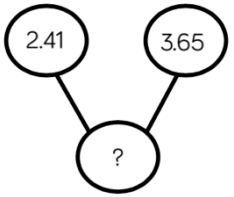
To add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
To add and subtract numbers mentally with increasingly large numbers
To use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Operation: Addition
Skill: To add numbers with more than 4 digits, e.g. 104328 + 61731 = 166059.

Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters to model the process of adding and exchanging, where necessary, during column addition. Add the two numbers together by combining the ones, then the tens, then the hundreds and then the thousands. If the column totals more than 9, exchange 10 (ones, tens, hundreds, thousands) for 1 (ten, hundred, thousand, ten thousand) before recombining to find the answer. 	Bar models or part whole models with drawings/ jottings. Draw representations using place value (PV) grid.	Part whole model  Bar model 166059 104328 | 61731 Written calculations - applying fact families 104328 + 61731 = 166059 61731 + 104328 = 166059 166059 = 104328 + 61731 166059 = 61731 + 104328

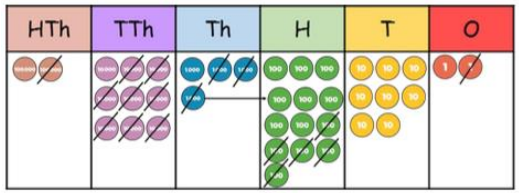
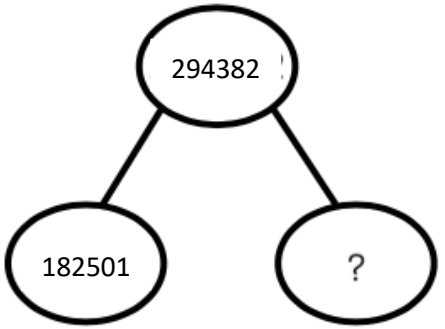
		Column method 1 0 4 3 2 8 + 6 1 7 3 1 1 6 6 0 5 9 1

Operation: Addition
Skill: To add with up to 3 decimal places, e.g. 3.65 + 2.41 = 6.06.

Concrete	Pictorial	Abstract
Place value counters to model the process of adding and exchanging, where necessary, during column addition. Add the two numbers together by combining the hundredths, then tenths and then ones. If the column totals more than 9, exchange 10 (hundredths, tenths, ones) for 1 (tenth, one, ten) before recombining to find the answer. 	Draw representations using place value (PV) grid.  Bar models or part whole models with drawings/ jottings.	Part whole model  Bar model 6.06 3.65 | 2.41 Written calculations - applying fact families 3.65 + 2.41 = 6.06 2.41 + 3.65 = 6.06 6.06 = 3.65 + 2.41 6.06 = 2.41 + 3.65

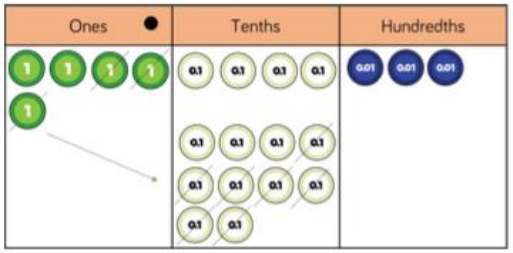
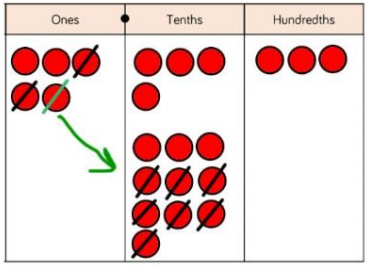
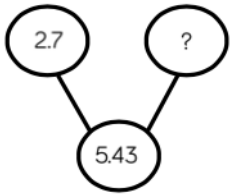
		Column method 3.65 + 2.41 6.06 1

Operation: Subtraction
Skill: To subtract with more than 4 digits, e.g. 294382 – 182501 = 111881.

Concrete	Pictorial	Abstract
Using manipulatives to show how objects can be taken away, e.g. dienes, place value counters. Make the largest whole number and take away the smaller number. If crossing over place value columns, exchange one ten for ten ones, one hundred for ten tens or one thousand for ten hundreds etc. before subtracting. 	Draw representations using place value (PV) grid. Bar models or part whole models with drawings/ jottings.	Part whole model  Bar model – applying fact families 294382 182501 | 111881 294382 – 182501 = 111881 294382 – 111881 = 182501 111881 = 294382 – 182501 182501 = 294382 – 111881

		182501 + 111881 = 294382 111881 + 182501 = 294382 294382 = 182501 + 111881 294382 = 111881 + 182501 Column method 3 13 2 9 ~~4~~ ~~3~~ 8 2 - 1 8 2 5 0 1 1 1 1 8 8 1

Operation: Subtraction
Skill: To subtract with up to 3 decimal places, e.g. 5.43 – 2.7 = 2.73.

Concrete	Pictorial	Abstract
Place value counters to model the process of adding and exchanging, where necessary, during column addition. Subtract the two numbers together by making the largest number and then crossing out the value of the smaller number. If crossing over place value columns, exchange one hundredth for ten tenths, one one for ten tenths etc. before subtracting. 	Draw representations using place value (PV) grid.  Bar models or part whole models with drawings/ jottings.	Part whole model  Bar model – applying fact families 5.43 2.7 | 2.73 Column method 4 14 5 . ~~4~~ 3 - 2 . 7 **0** 2 . 7 3 Use zero as a placeholder

YEAR 6 ADDITION AND SUBTRACTION

National Curriculum requirements:

To perform mental calculations, including with mixed operations and large numbers

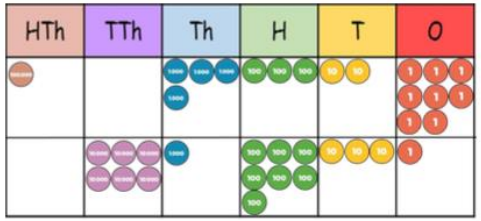
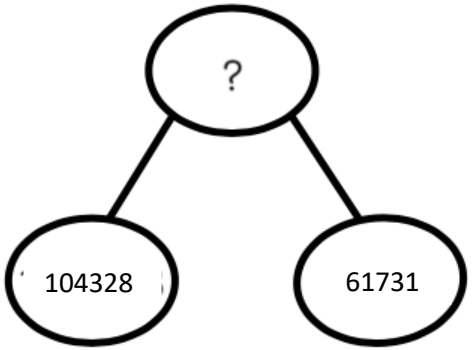
To use their knowledge of the order of operations to carry out calculations involving the four operations

To solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

To solve problems involving addition, subtraction, multiplication and division

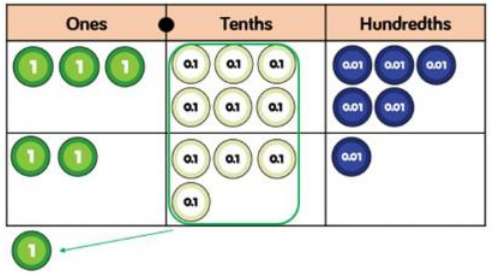
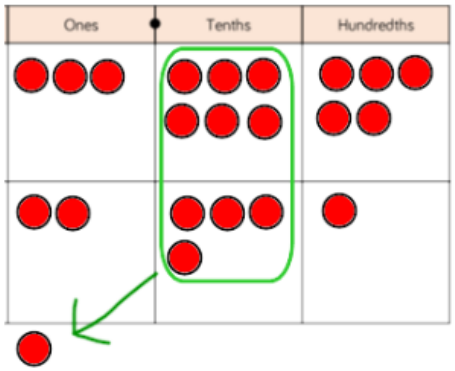
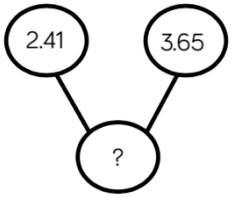
To use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Operation: Addition
Skill: To add numbers with more than 4 digits, e.g. 104328 + 61731 = 166059.

Concrete	Pictorial	Abstract
Numicon/ dienes/ place value counters to model the process of adding and exchanging, where necessary, during column addition. Add the two numbers together by combining the ones, then the tens, then the hundreds and then the thousands. If the column totals more than 9, exchange 10 (ones, tens, hundreds, thousands) for 1 (ten, hundred, thousand, ten thousand) before recombining to find the answer. 	Bar models or part whole models with drawings/ jottings. Draw representations using place value (PV) grid.	Part whole model  Bar model 166059 104328 | 61731 Written calculations - applying fact families 104328 + 61731 = 166059 61731 + 104328 = 166059 166059 = 104328 + 61731 166059 = 61731 + 104328

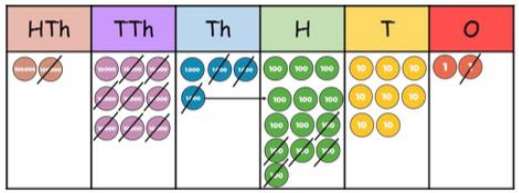
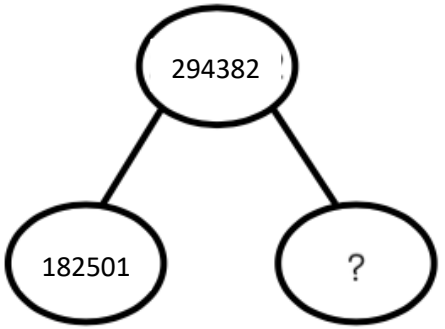
		Column method 104328 + 61731 166059 1

Operation: Addition
Skill: To add with up to 3 decimal places, e.g. 3.65 + 2.41 = 6.06.

Concrete	Pictorial	Abstract
Place value counters to model the process of adding and exchanging, where necessary, during column addition. Add the two numbers together by combining the hundredths, then tenths and then ones. If the column totals more than 9, exchange 10 (hundredths, tenths, ones) for 1 (tenth, one, ten) before recombining to find the answer. 	Draw representations using place value (PV) grid.  Bar models or part whole models with drawings/ jottings.	Part whole model  Bar model 6.06 3.65 | 2.41 Written calculations - applying fact families 3.65 + 2.41 = 6.06 2.41 + 3.65 = 6.06 6.06 = 3.65 + 2.41 6.06 = 2.41 + 3.65

		Column method 3.65 + 2.41 6.06 1

Operation: Subtraction
Skill: To subtract with more than 4 digits, e.g. 294382 – 182501 = 111881.

Concrete	Pictorial	Abstract
Using manipulatives to show how objects can be taken away, e.g. dienes, place value counters. Make the largest whole number and take away the smaller number. If crossing over place value columns, exchange one ten for ten ones, one hundred for ten tens or one thousand for ten hundreds etc. before subtracting. 	Draw representations using place value (PV) grid. Bar models or part whole models with drawings/ jottings.	Part whole model  Bar model – applying fact families 294382 182501 | 111881 294382 – 182501 = 111881 294382 – 111881 = 182501 111881 = 294382 – 182501 182501 = 294382 – 111881

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St Thomas More Catholic Primary School Calculation Policy

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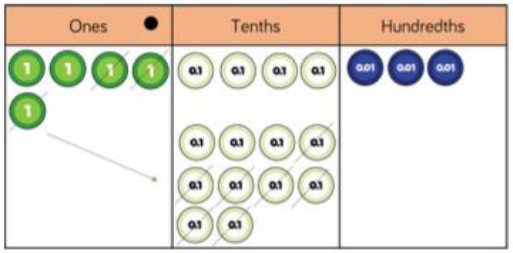
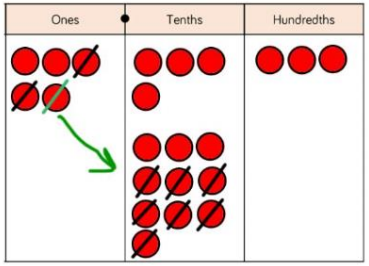
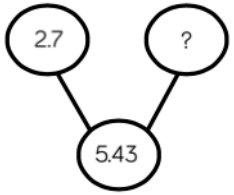
Place value counters to model the process of adding and exchanging, where necessary, during column addition. Subtract the two numbers together by making the largest number and then crossing out the value of the smaller number. If crossing over place value columns, exchange one hundredth for ten tenths, one one for ten tenths etc. before subtracting. 	Draw representations using place value (PV) grid.  Bar models or part whole models with drawings/ jottings.	Part whole model  Bar model – applying fact families 5.43 2.7 | 2.73 Column method 4 14 5 . ~~4~~ 3 - 2 . 7 **0** 2 . 7 3 Use zero as a placeholder