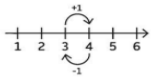
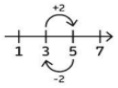
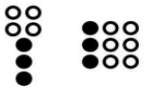
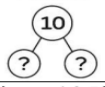
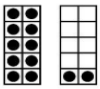
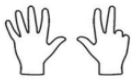
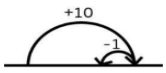
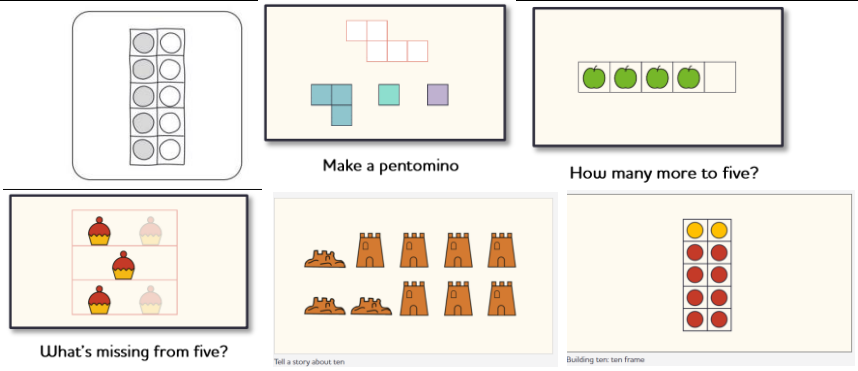
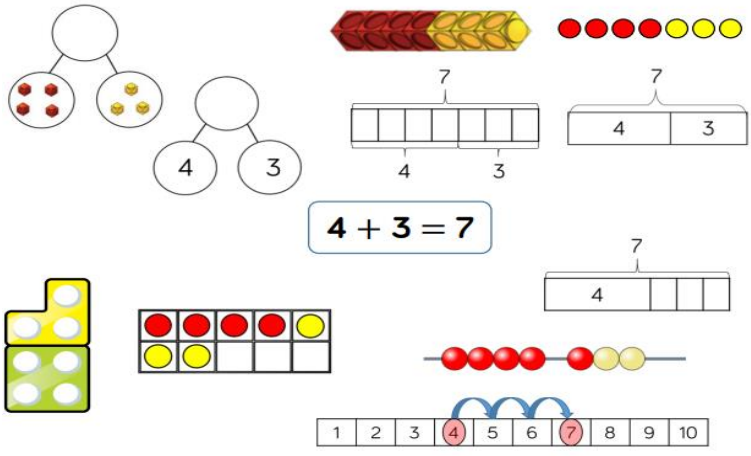
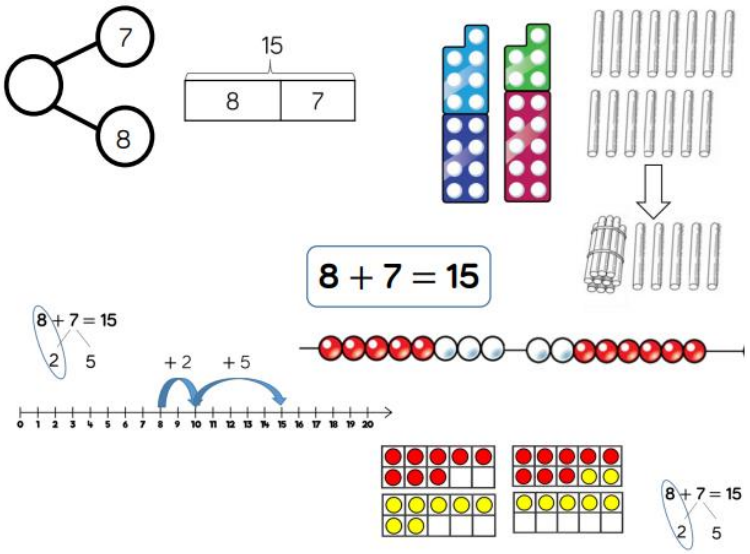
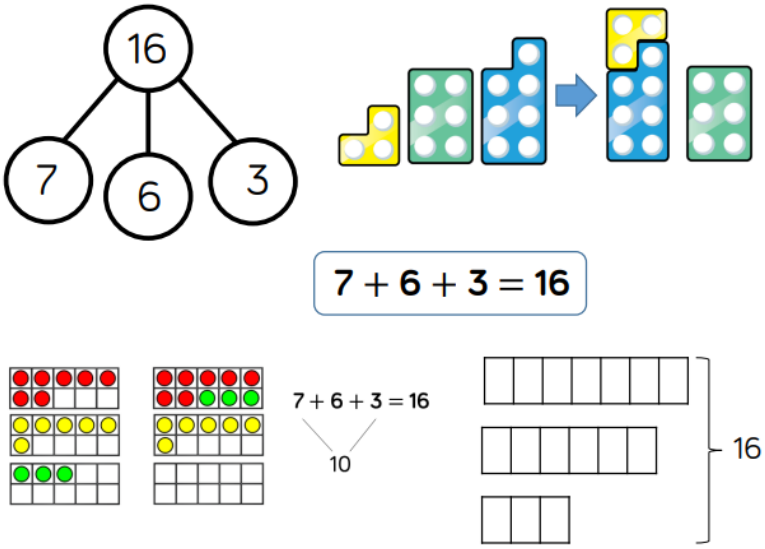
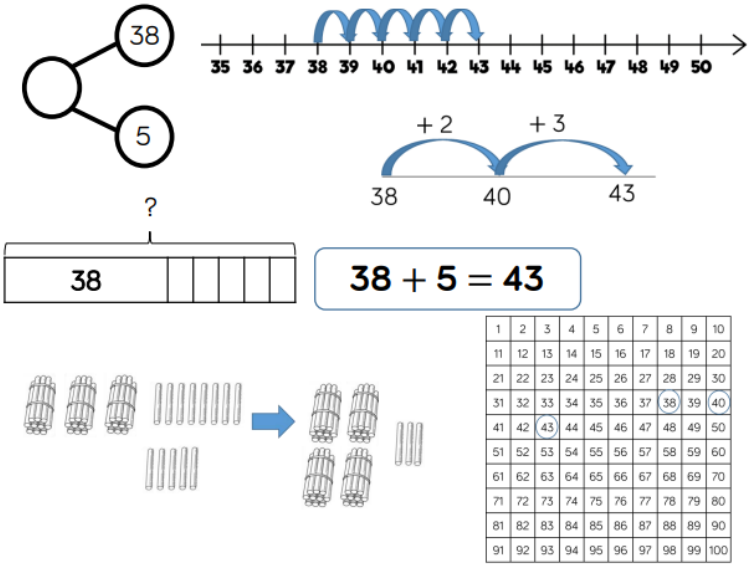
Wales Primary School Calculation Policy

Addition and subtraction

One More, One Less 	When we add one, we get the next counting number. When we subtract one, we get the previous counting number (e.g. 5 – 1 = 4).	**Number Neighbours: Spot the Difference** 	Adjacent numbers have a difference of 1. Adjacent odds and evens have a difference of 2. Spot number neighbours (adjacent, odds or evens) to solve subtractions of adjacent numbers (e.g. 5 – 4 = 1), of adjacent odds (e.g. 9 – 7 = 2) or adjacent evens (e.g. 6 – 4 = 2)
Two More, Two Less: Think Odds and Evens 	If we add two to a number, we go from odd to next odd or even to next even. If we subtract two from a number, we go from odd to previous odd or even to previous even.	**7 Tree and 9 Square** 	Use these visual images to remember addition and subtractions fact families that children can find tricky. For example, visualising the 7 tree helps remember that 7 – 3 = 4. Visualising the 9 square helps remember that 3 + 6 = 9.
Number 10 Fact Families 	Go beyond just recalling the pairs of numbers that add to 10. Make sure that we can also spot additions and subtractions which we can use number bonds to 10 to solve.	**Ten and A Bit** 	The numbers 11 – 20 are made up of 'Ten and a Bit'. Recognising and understanding the 'Ten and a Bit' structure of these numbers enables addition and subtraction facts involving their constituent parts (e.g. 3 + 10 = 13, 17 – 7 = 10, 12 – 10 = 2).
Five and A Bit 	The numbers 6, 7, 8 and 9 are made up of 'five and a bit'. This can be shown on hands, and supports decomposition of these numbers into their five and a bit parts (e.g. 5 + 3 = 8, 9 – 5 = 4).	**Make Ten and Then...** 	Additions which cross the 10 boundary can be calculated by 'Making Ten' first, and then adding on the remaining amount (e.g. 8 + 6 can be calculated by thinking '8 + 2 = 10 and 4 more makes 14'). The same strategy can be applied to subtractions through 10.
Know about 0 	When we add 0 to or subtract 0 from another number, the total remains the same. If we subtract a number from itself, the difference is 0.	**Adjust It** 	Any addition and subtraction can be calculated by adjusting from a fact you know already, (e.g. 6 + 9 is one less than 6 + 10).
Doubles and Near Doubles 	Memorise doubles of numbers to 10, using a visual approach. Then use these known double facts to calculate near doubles and hidden doubles. Once we know 6 + 6 = 12 then 6 +7 and 5 + 7 is easy.	**Swap It** 	When the order of two numbers being added (addends) is exchanged the total remains the same. E.g. 1 + 8 = 8 + 1. Sometimes reversing the order of the two addends makes addition easier to think about conceptually.

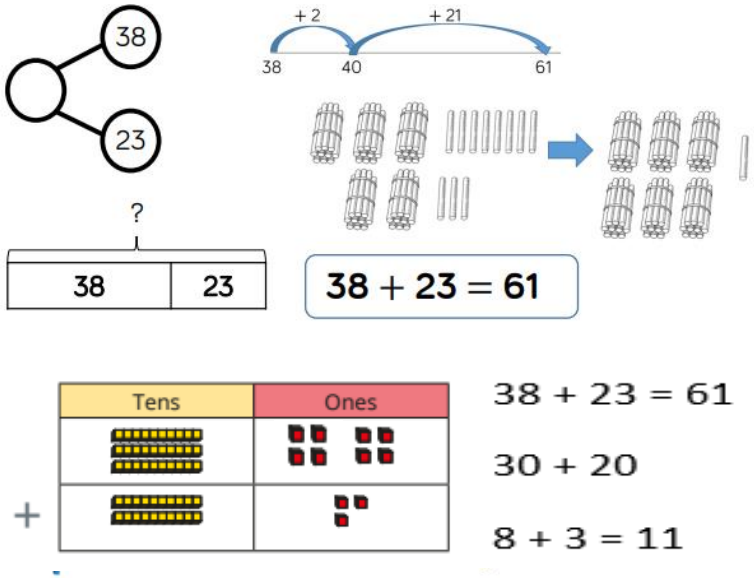
Key skills for addition	Representations / models
(FS2) Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts Concept that + the answer will be greater Number bonds to 5 / 10	 *Subitising, partitioning, tell a story, building a 5/10 frame/ bead bar, what's missing from a 5/10 frame/ bead bar*
(Y1) Add two 1 digit numbers to 10 Number bonds to 10 and within 10	

	Part – whole model, bar model, number shapes, ten frame (within 10), bead strings (10), number tracks
(Y1/2) Add 1 and 2 digit numbers to 20 Add a single digit to a multiple of 10 mentally Number bonds to 10 / 20 Use number line to count on (and back) in different step sizes Partition numbers in different ways e.g. 8 + 7 = 8 + 2 + 5	 *Part – whole model, bar model, number shapes, ten frame (within 20), bead strings (20), number tracks, number lines (labelled) straws*
(Y2) Add 3 1 digit numbers Add more than 2 single digit numbers mentally Look for bonds / doubles / near doubles	 *Part – whole model, bar model, number shapes, ten frame (within 20)*
(Y2/3) Add 1 and 2 digit numbers to 100 Partition numbers in different ways e.g. 32 = 20 + 12, 22+10 Know what needs to be added to a number to make the next multiple of 10 Add 9 by adding 10 and subtract 1 **Written method – numberline / partitioning**	 *Part – whole model, bar model, number lines (labelled and blank), straws, hundred square*

(Y2/3) Add two 2-digit numbers

Partition numbers in different ways e.g.
38 + 23 = 38 + 2 + 21

Written method – partitioning

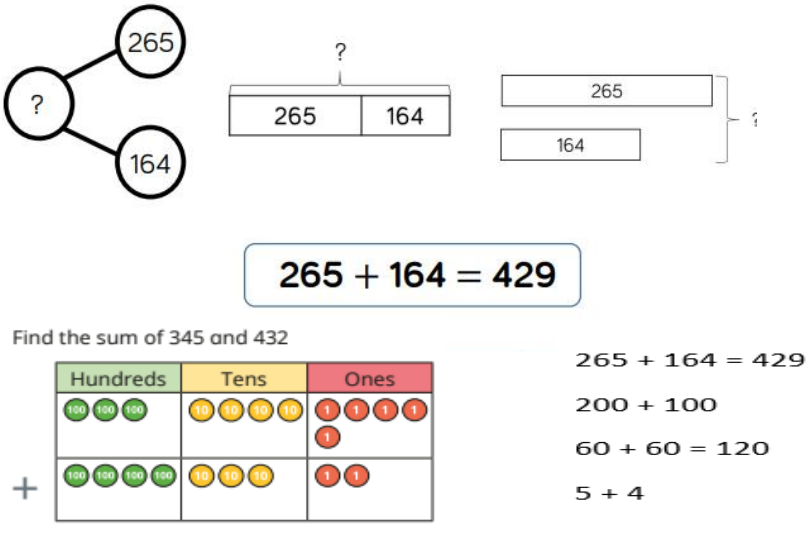


Part-whole model, bar model, number lines (blank), straws, base 10, place value counters

(Y3) Add with up to 3-digits

Know what needs to be added to a 3 digit number to get to the next 100
To add 2 2 digit numbers mentally
Add multiples of 10 mentally

Written method – partitioning

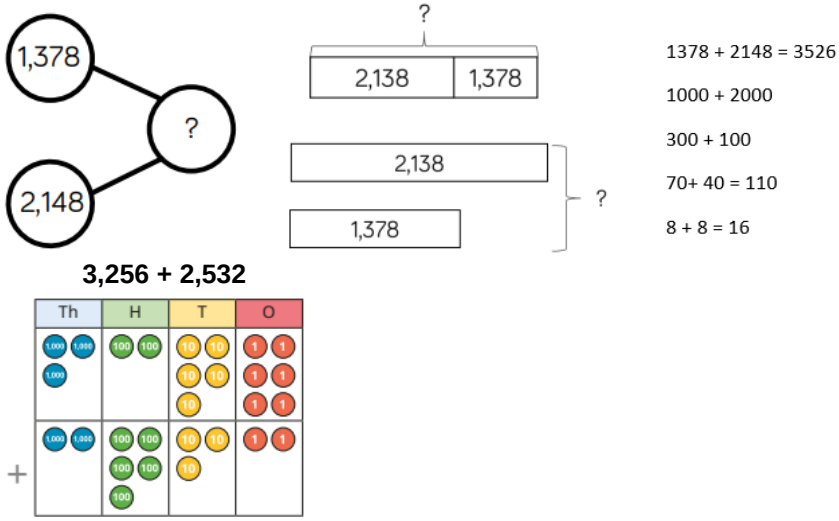


Part-whole model, bar model, base 10, place value counters

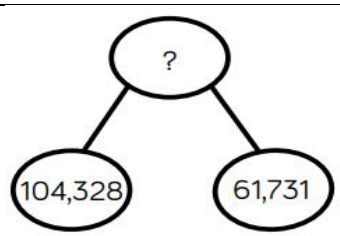
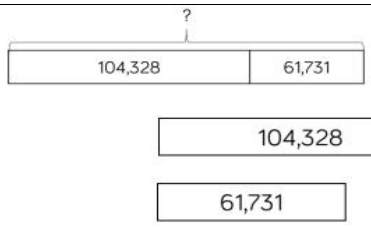
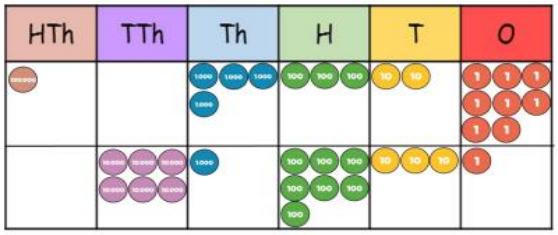
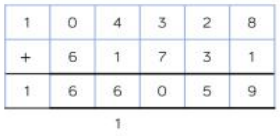
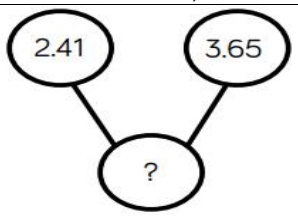
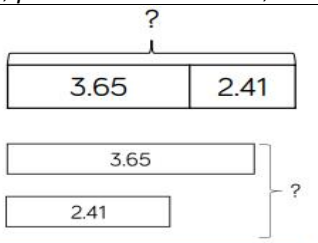
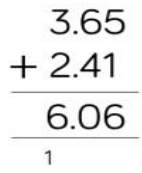
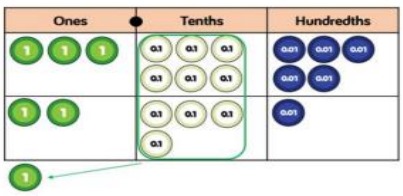
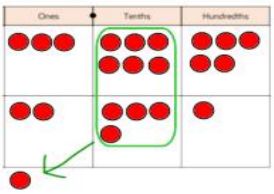
(Y4) Add with up to 4-digits

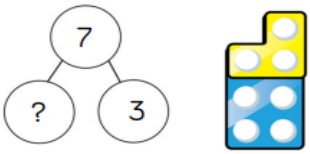
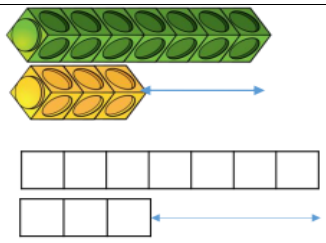
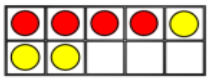
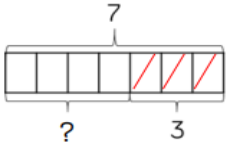
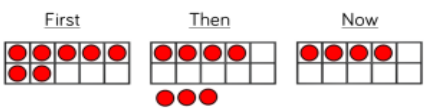
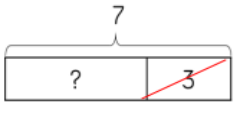
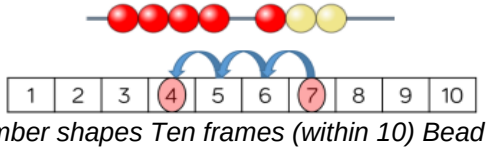
Work out pairs of multiples of 10 mentally
Know what needs to be added to a 4 digit number to get to the nearest 100 / 1000

Written method – partitioning



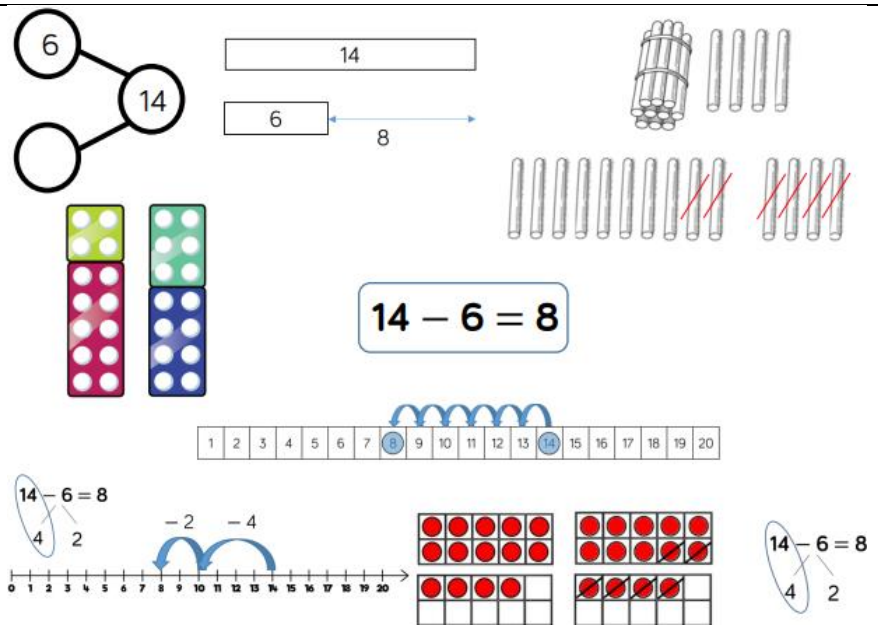
Part-whole model, bar model, base 10, place value counters

(Y5/6) Add with more than 4 digits Use sense of estimation **Written method – column**	  104,328 + 61,731 = 166,059   *Part-whole model, bar model, place value counters, column addition*
(Y5) Add with up to 3 decimal places **Written method – column**	   3.65 + 2.41 = 6.06   *Part-whole model, bar model, place value counters, column addition*

<u>Key skills for subtraction</u>	<u>Representations / models</u>
(FS2) See under addition	
(Y1) Subtract two 1-digit numbers to 10 Know number bonds within 10	   7 − 3 = 4     *Part-whole model Bar model Number shapes Ten frames (within 10) Bead strings (10) Number tracks*

(Y1/2) Subtract 1 and 2-digit numbers to 20

Subtract 9 to a number by subtracting 10 then adding 1
Know number bonds to 20
Use related inverse facts
Know what must be added to a number to get to the next multiple of 10



Part-whole model Bar model Number shapes Ten frames (within 20) Bead string (20) Number tracks Number lines (labelled) Straws

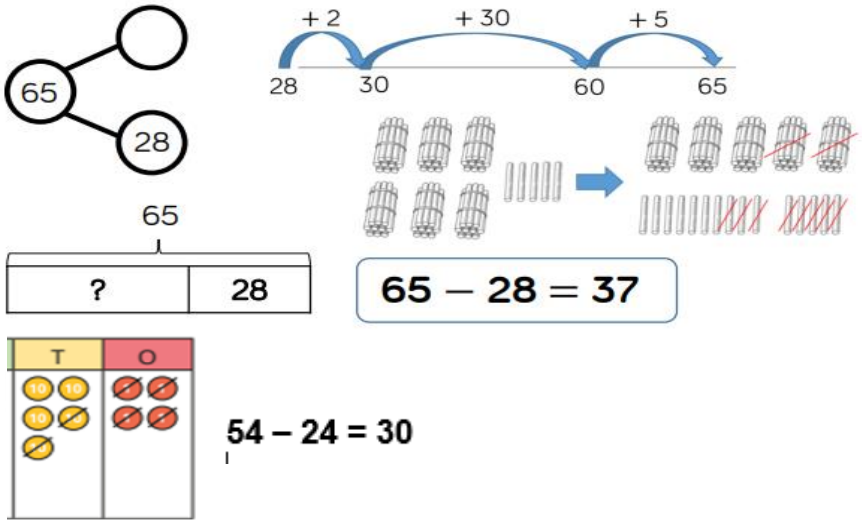
(Y2/3) Subtract 1 and 2-digit numbers to 100

Know what must be added to a number to get to the next multiple of 10
Know pairs of multiples or 10 to 100

(Y2) Subtract two 2-digit numbers

Know pairs of numbers to 100 e.g. 32 + 68 = 100
Know addition and subtraction facts for all numbers to 20 e.g. 13 – 8 = 4 + = 17

Written method – numberline (using place value counters / base 10 only to be used where no crossing boundaries)



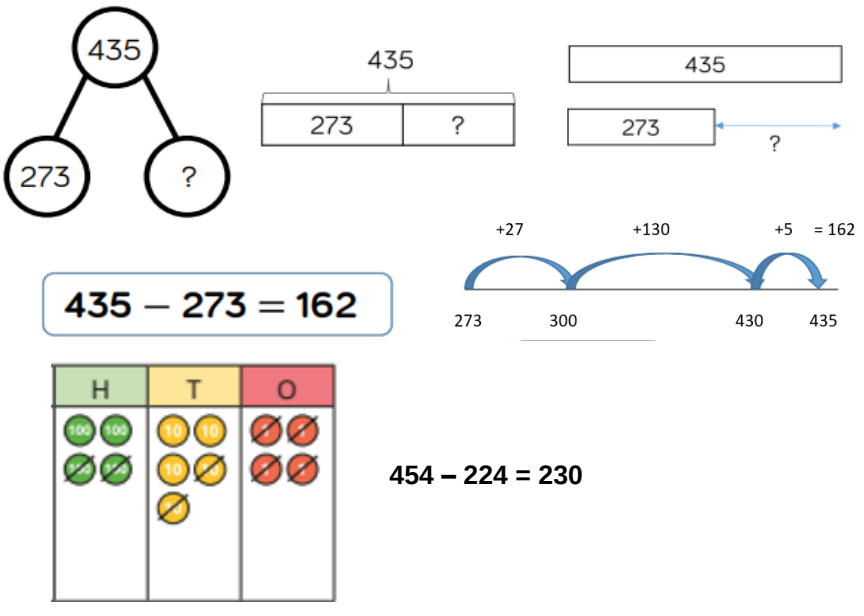
Part-whole model Bar model Number lines (labelled) Number lines (blank) Straws Hundred square Place value counters

(Y3) Subtract with up to 3-digits

Know pairs of numbers to 100 e.g. 32 + 68 = 100
Know what must be added to any 3 digit number to make the next 100
Add 3 numbers mentally (2 digit number, 3 digit number – multiple of 10 and single digit)
Make jottings if needed
Know in multiples of 10 how to get closest to a number e.g. from 300 to 435 would be +130 to get to 430

Written method – numberline

(using place value counters / base 10 only to be used where no crossing boundaries)

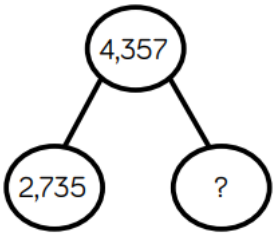


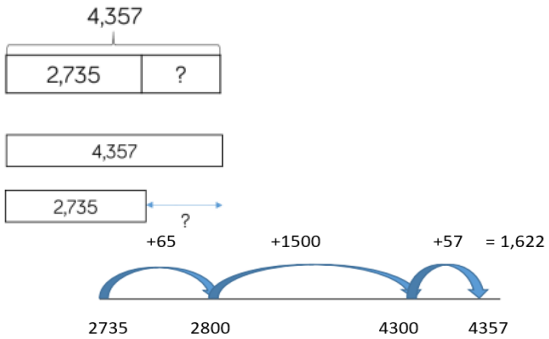
Part-whole model Bar model Base 10 Place value counters

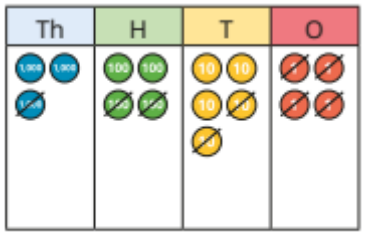
(Y4) Subtract with up to 4-digits

Know pairs of numbers to 100 e.g. 32 + 68 = 100
Know what must be added to any 3 digit number to make the next 100
Add 3 numbers mentally (2 2-digit numbers 4 digit number – multiple of 100)
Make jottings if needed
Know in multiples of 100 how to get closest to a number e.g. from 2800 to 4357 would be +1500 to get to 4300

Written method – numberline (using place value counters / base 10 only to be used where no crossing boundaries)







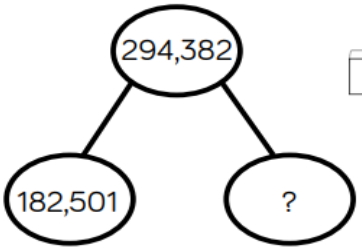
3.454 – 1,224 = 2230

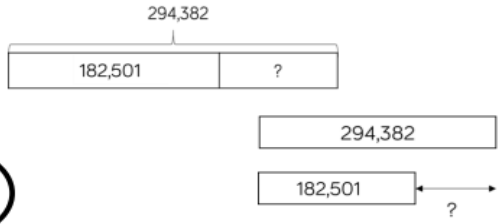
Part-whole model Bar model Base 10 Place value counters

(Y5/6) Subtract with more than 4 digits

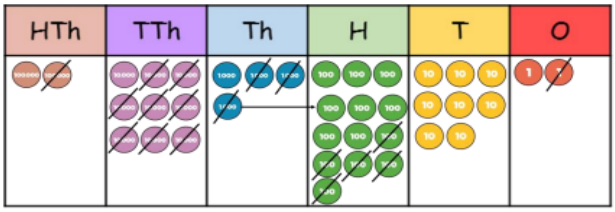
Estimation for sense of answer

Written method – column





294,382 – 182,501 = 111,881



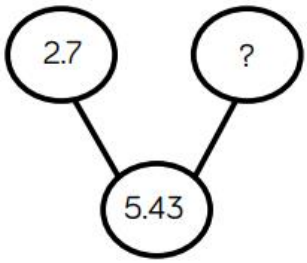
	2	9	3 4	1 3	8	2
–	1	8	2	5	0	1
	1	1	1	8	8	1

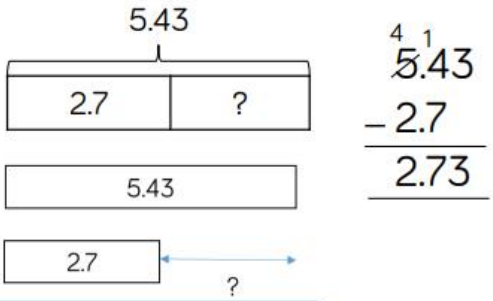
Part-whole model Bar model Place value counters Column subtraction

(Y5/6) Subtract with up to 3 decimal places

Estimation for sense of answer

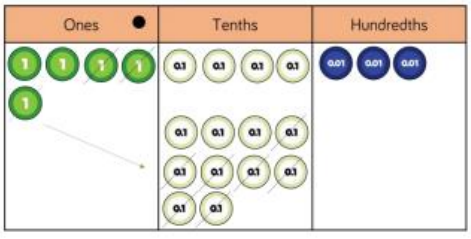
Written method – column

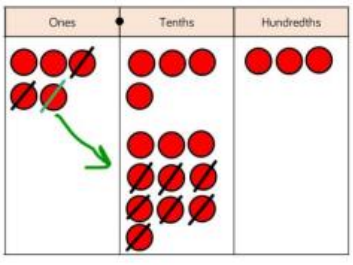




5.43 – 2.7 = 2.73

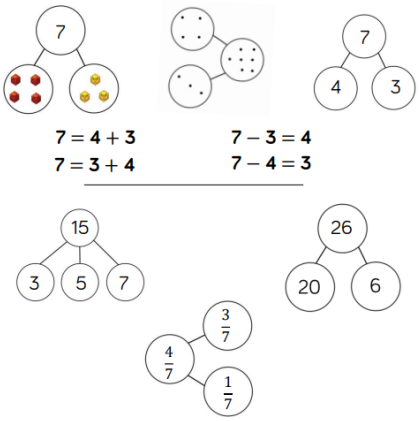
$$\begin{array}{r} {}^{4}\not{5}.{}^{1}43 \\ -\ 2.7 \\ \hline 2.73 \end{array}$$



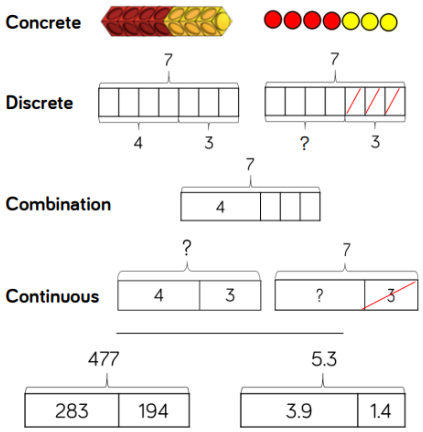


Part-whole model Bar model Place value counters Column subtraction

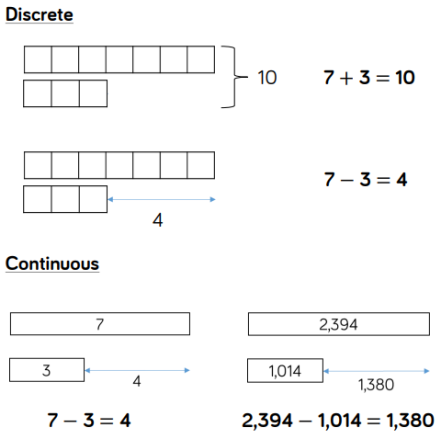
Part-Whole Model



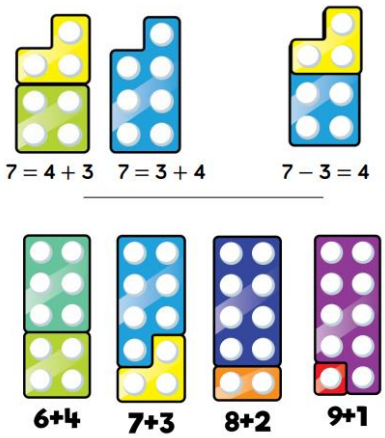
Bar Model (single)



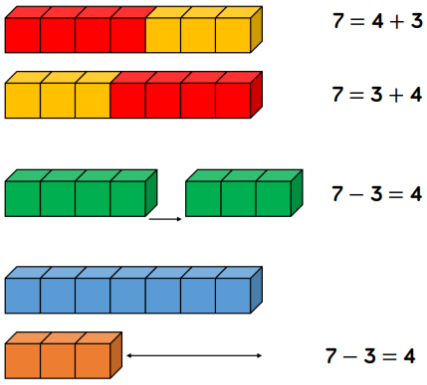
Bar Model (multiple)



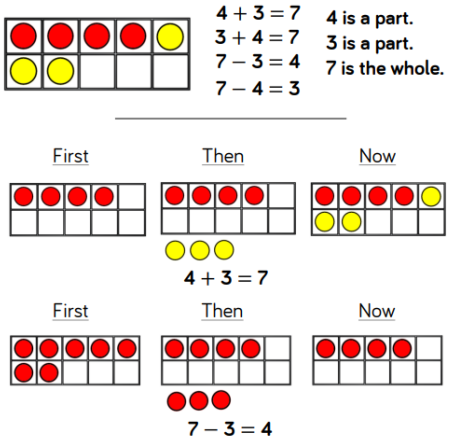
Number Shapes



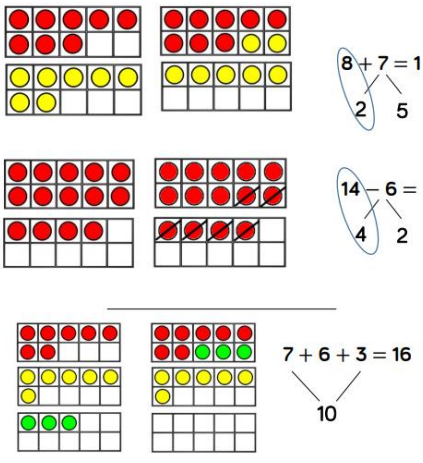
Cubes



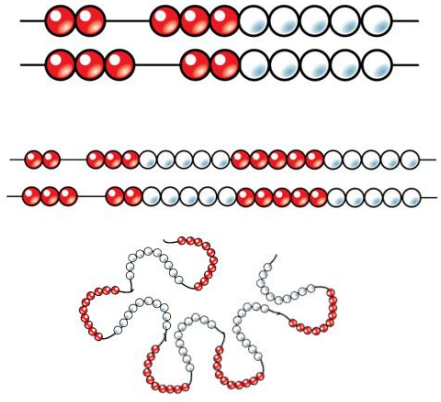
Ten Frames (within 10)



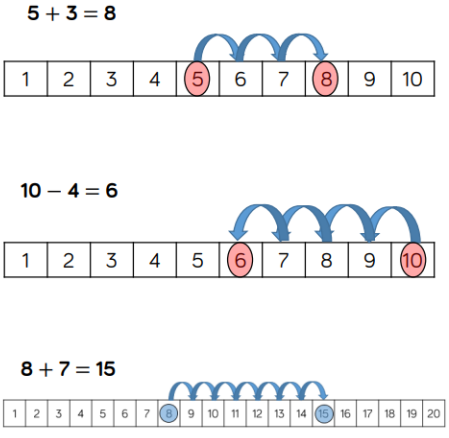
Ten Frames (within 20)



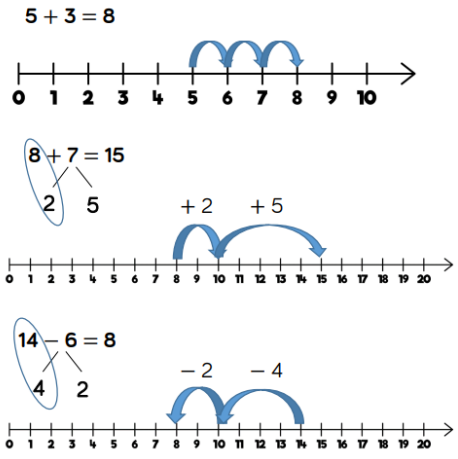
Bead Strings



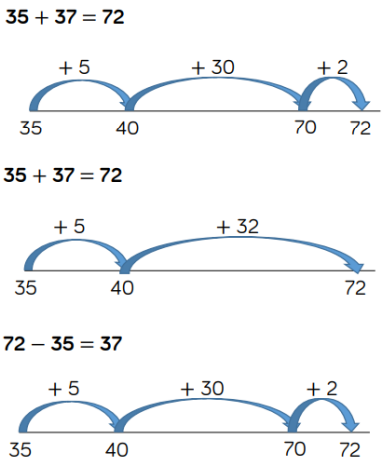
Number Tracks



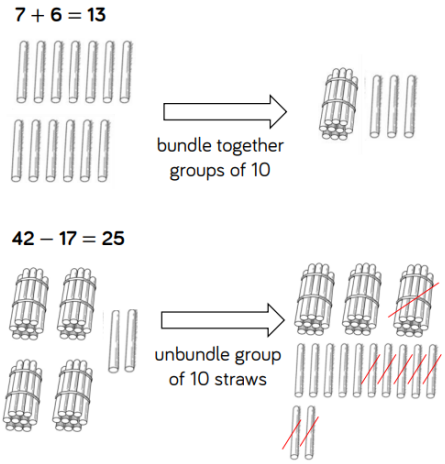
Number Lines (labelled)



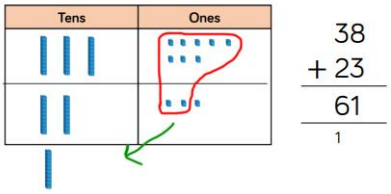
Number Lines (blank)

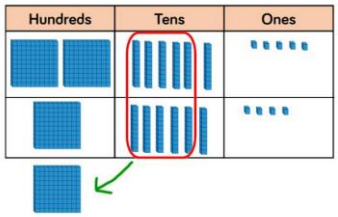


Straws

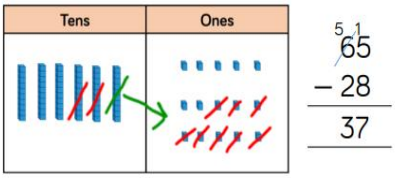


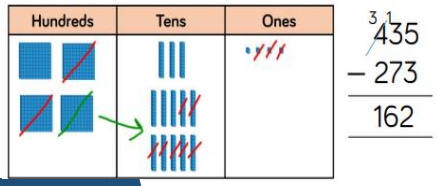
Base 10/Dienes (addition)



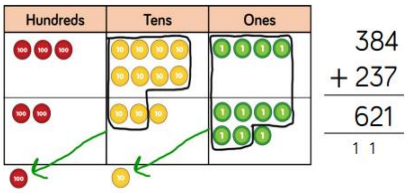


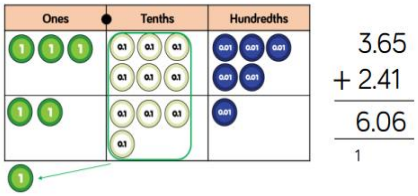
Base 10/Dienes (subtraction)



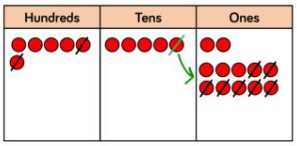


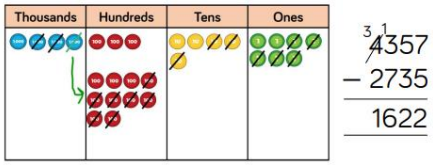
Place Value Counters (addition)



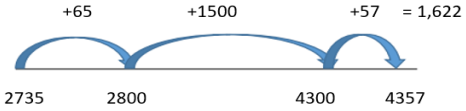


Place Value Counters (Subtraction)





Number line finding the difference



1. Go to next multiple of 10 or 100 (1 or 2digit no.)
2. Go to the closest multiple of 10 or 100 to the number (multiples of 10)
3. Go to the final number (1 or 2digit no.)