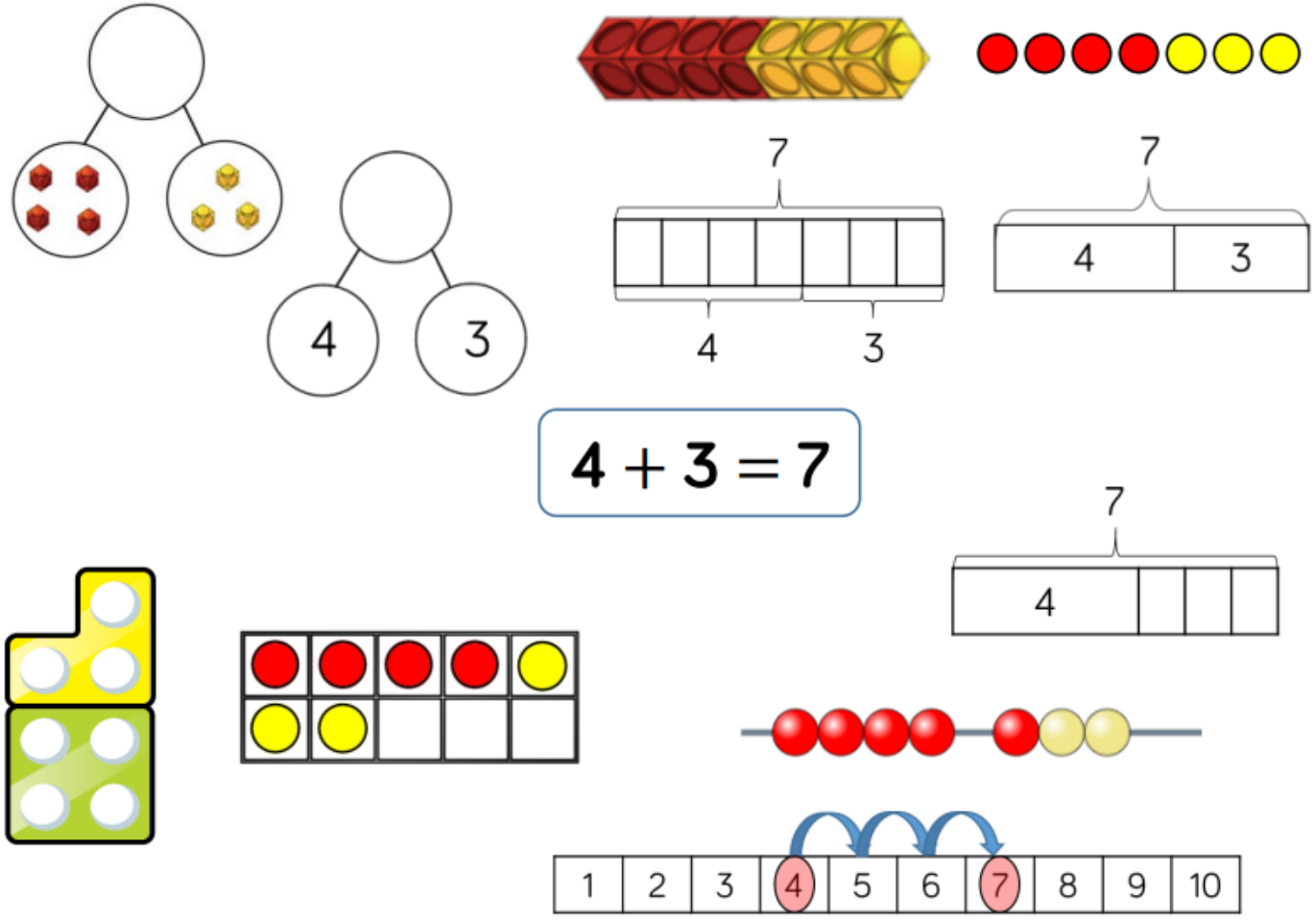
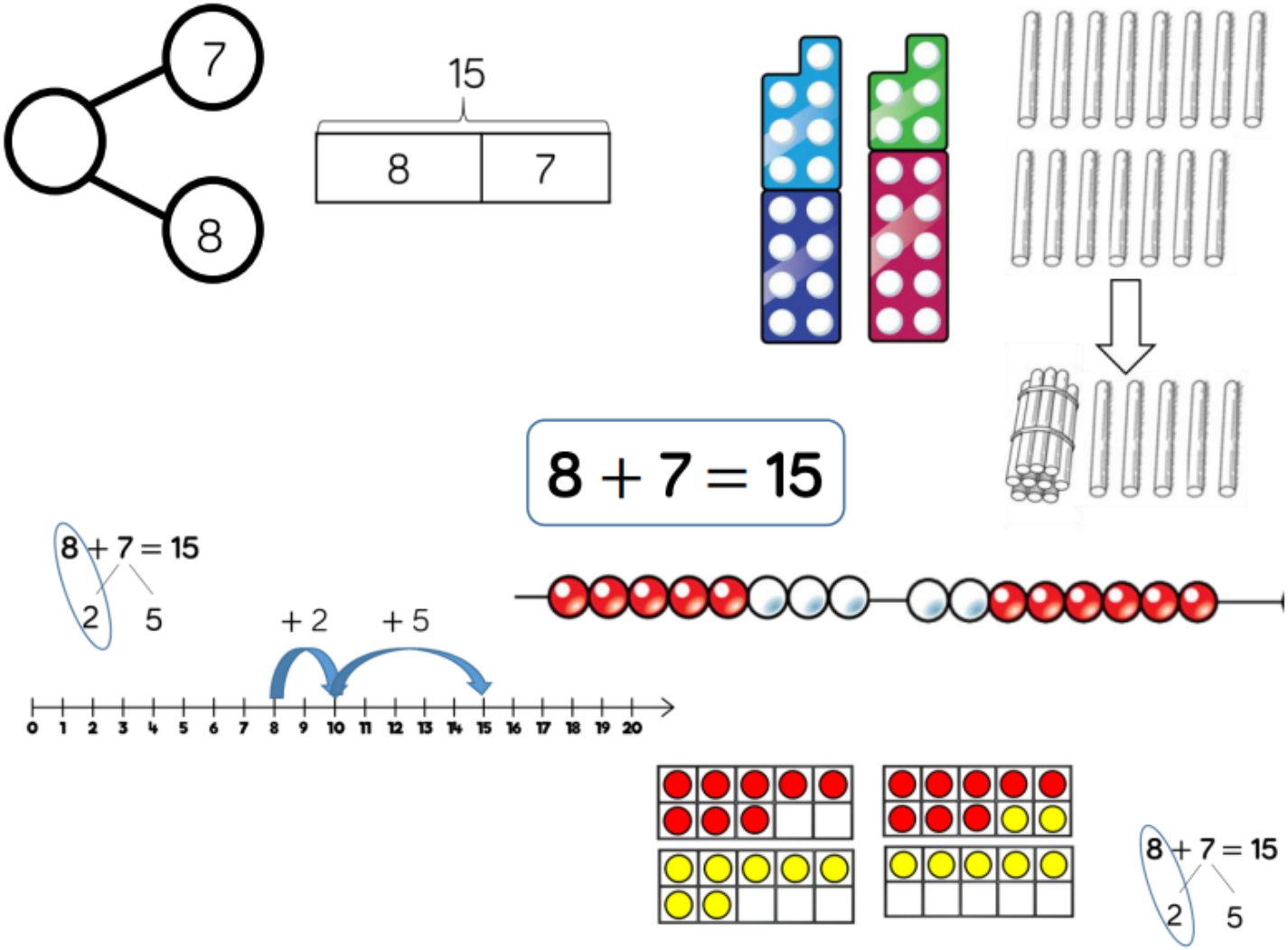
Mathematics Calculation Policy

Addition and Subtraction

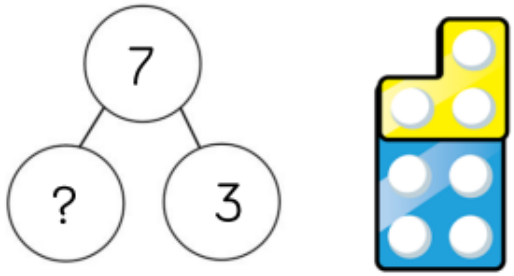
Year 1 Addition and Subtraction	
Objective	**Key Skill**
• read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9.	**Addition** • Read and write numbers to 100 in numerals, incl. 1—20 in words • Recall bonds to 10 and 20, and addition facts within 20 • Count to and across 100 • Count in multiples of 1 2, 5 and 10 • Solve simple 1-step problems involving addition, using objects, number lines and pictorial representations. **Subtraction** • Given a number, say one more or one less. • Count to and over 100, forward and back, from any number. • Represent and use subtraction facts to 20 and within 20. • Subtract with one-digit and two-digit numbers to 20, including zero. • Solve one-step problems that involve addition and subtraction, using concrete objects (ie bead string, objects, cubes) and pictures, and missing number problems. • Read and write numbers from 0 to 20 in numerals and words.
Vocabulary	
Addition add, more, plus, and, put together, make, altogether, total, equal to, equals, double, most, count on, number line **Subtraction** equal to, take, take away, less, subtract, leaves, difference, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_?	

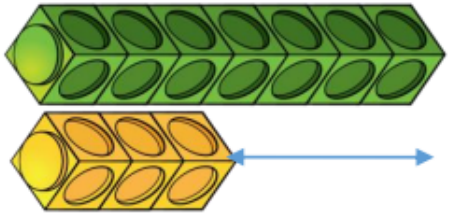
Skill: Add 1-digit numbers within 10	Year: 1
	When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track all support augmentation.

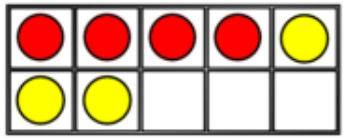
Skill: Add 1 and 2-digit numbers to 20	Year: 1/2
	When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

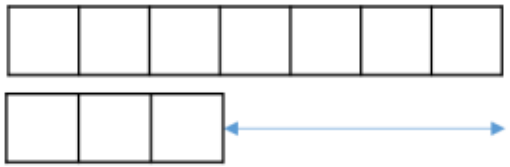
Skill: Subtract 1-digit numbers within 10

Year: 1

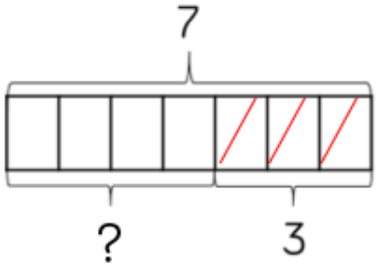


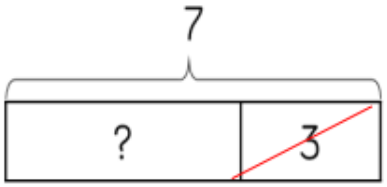


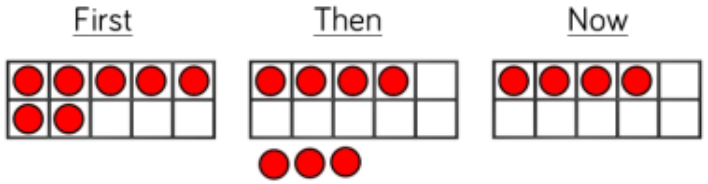


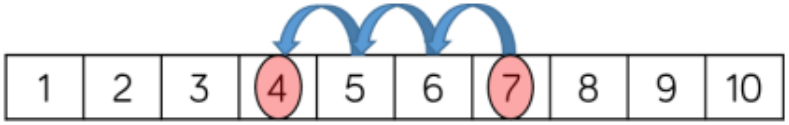


$$7 - 3 = 4$$









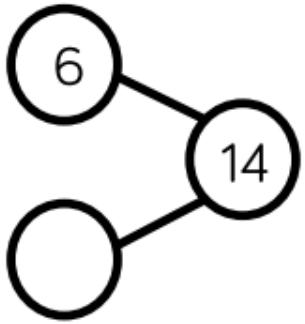
Part-whole models, bar models, ten frames and number shapes support partitioning.

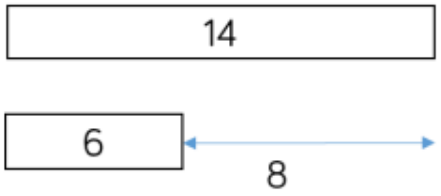
Ten frames, number tracks, single bar models and bead strings support reduction.

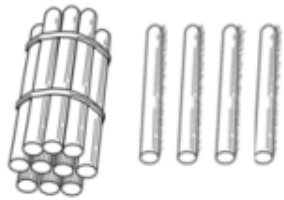
Cubes and bar models with two bars can support finding the difference.

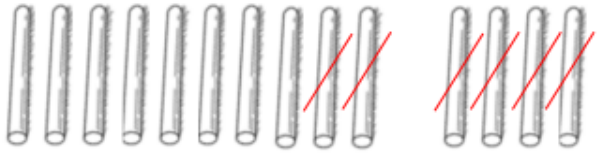
Skill: Subtract 1 and 2-digit numbers to 20

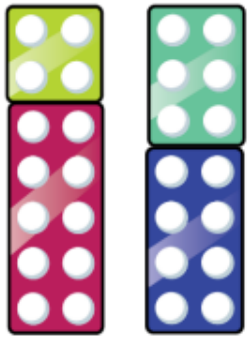
Year: 1/2



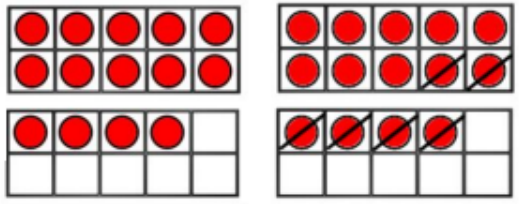


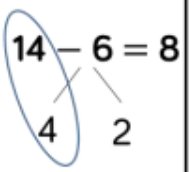






14 − 6 = 8

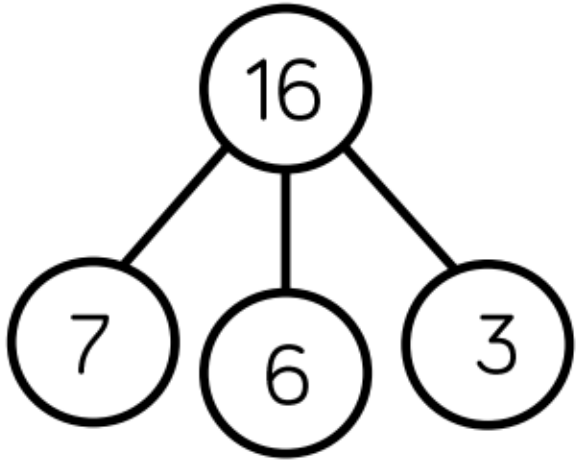
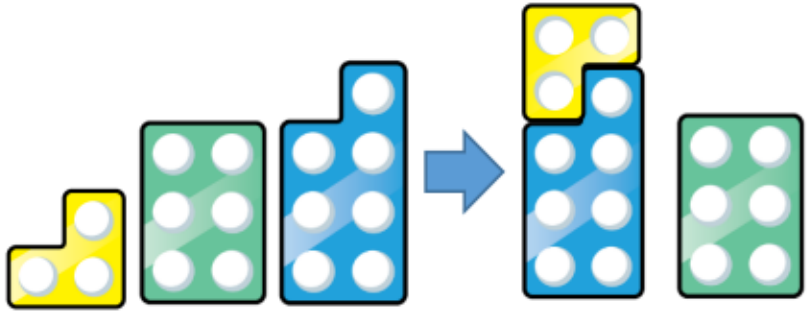
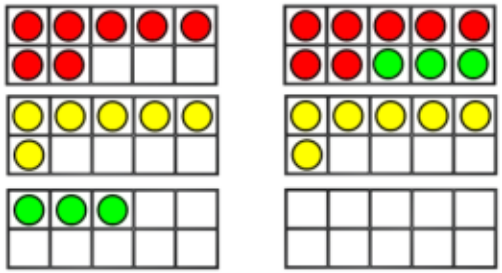
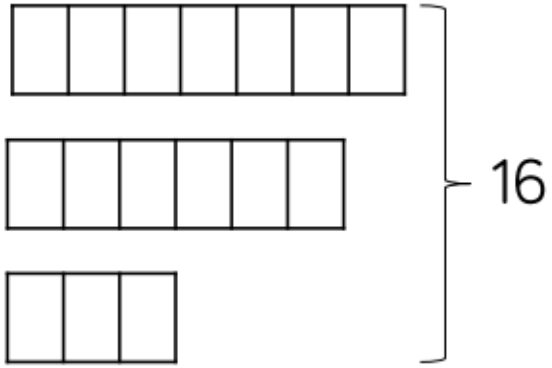




When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

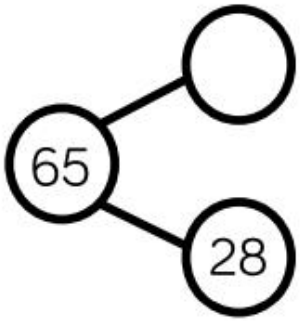
Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

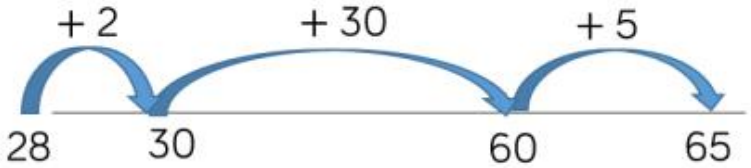
Year 2 Addition and Subtraction	
Objective	**Key Skill**
• solve problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: - a two-digit number and ones - a two-digit number and tens - a two two-digit numbers - adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	**Addition** • Add a 2-digit number and ones (e.g. 27 + 6) • Add a 2-digit number and tens (e.g. 23 + 40) • Add pairs of 2-digit numbers (e.g. 35 + 47) and add three single-digit numbers (e.g. 5 + 9 + 7) • Show that adding can be done in any order (the commutative law). • Recall bonds to 20 and bonds of tens to 100 (30 + 70 etc.) • Count in steps of 2, 3 and 5 and count in tens from any number. • Understand the place value of 2-digit numbers (tens and ones) • Compare and order numbers to 100 using < > and = signs. • Read and write numbers to at least 100 in numerals and words. • Solve problems with addition, using concrete objects, pictorial representations, involving numbers, quantities and measures, and applying mental and written methods. **Subtraction** • Recognise the place value of each digit in a two-digit number. • Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100. • Subtract using concrete objects, pictorial representations, 100 squares
Vocabulary	
Addition add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary **Subtraction** equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? difference, count on, strategy, partition, tens, units	

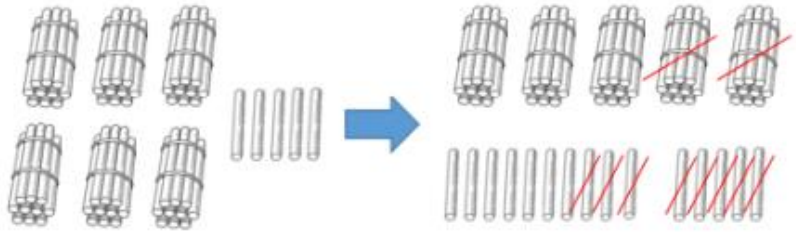
Skill: Add three 1-digit numbers	Year: 2
  $7 + 6 + 3 = 16$  $7 + 6 + 3 = 16$ 10 	When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently. This supports children in their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

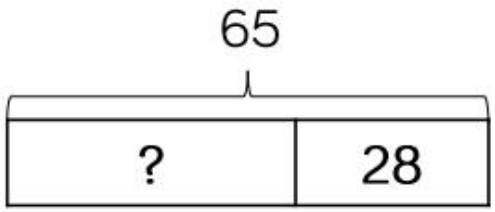
Skill: Subtract 1 and 2-digit numbers to 100

Year: 2

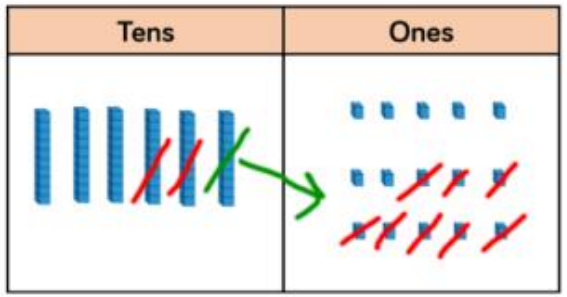




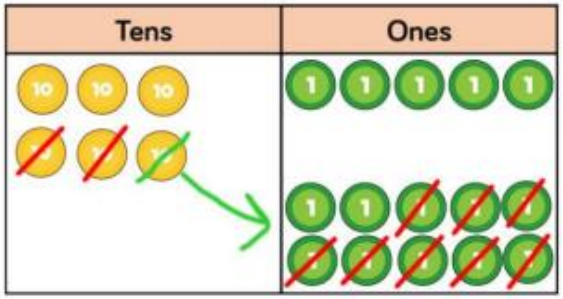




$$65 - 28 = 37$$



$$\begin{array}{r} {}^{5}\cancel{6}\,{}^{1}5 \\ -\ 28 \\ \hline 37 \end{array}$$



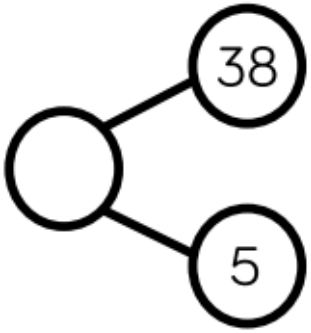
At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

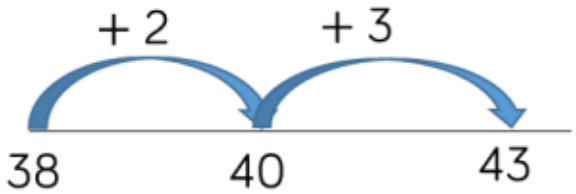
Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.

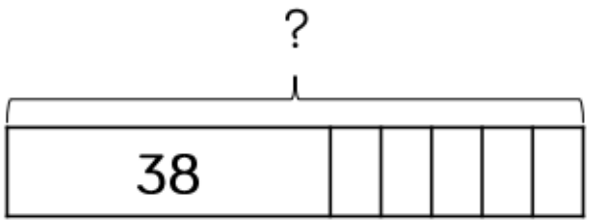
Objective	Key Skill
• Add and subtract numbers mentally - 3 digit number and 1s - 3 digit number and 10s - 3 digit number and 100s • Add and subtract numbers with up to 3 digits using formal written methods of columnar addition and subtraction. • Estimate the answer to a calculation and use inverse operations to check the answers • Solve problems including, missing number problems, using number facts, place value, and more complex addition and subtraction	**Addition** • Read and write numbers to 1000 in numerals and words. • Add 2-digit numbers mentally, incl. those exceeding 100. • Add a three-digit number and ones mentally (175 + 8) • Add a three-digit number and tens mentally (249 + 50) • Add a three-digit number and hundreds mentally (381 + 400) • Estimate answers to calculations, using inverse to check answers. • Solve problems, including missing number problems, using number facts, place value, and more complex addition. • Recognise place value of each digit in 3-digit numbers (hundreds, tens, ones.) • Continue to practise a wide range of mental addition strategies, ie. number bonds, adding the nearest multiple of 10, 100, 100 and adjusting, using near doubles, partitioning and recombining.
Vocabulary	
Addition add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact **Subtraction** equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit	**Subtraction** • Subtract mentally a: 3-digit number and ones, 3-digit number and tens, 3-digit number and hundreds . • Estimate answers and use inverse operations to check. • Solve problems, including missing number problems. • Find 10 or 100 more or less than a given number. • Recognise the place value of each digit in a 3-digit number . • Counting up differences as a mental strategy when numbers are close together or near multiples of 10 (see examples above) • Read and write numbers up to 1000 in numerals and words. • Practise mental subtraction strategies, such as subtracting near multiples of 10 and adjusting

Skill: Add 1-digit and 2-digit numbers to 100

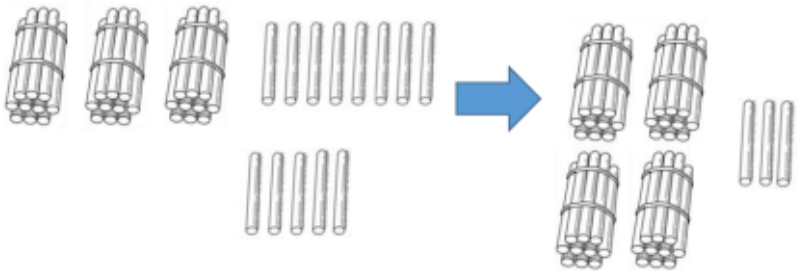
Year: 2/3







$$38 + 5 = 43$$



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

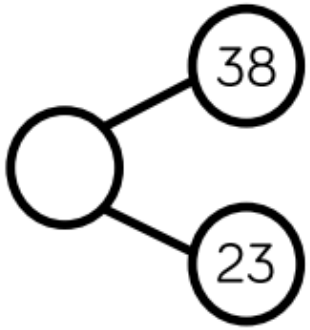
When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

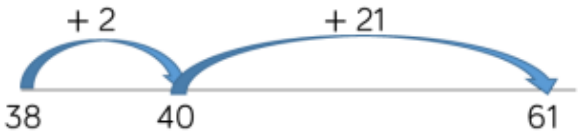
They should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 = 13 so 38 + 5 = 43.

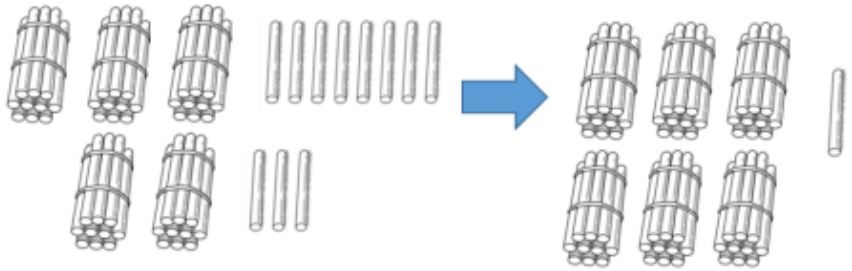
Hundred squares and straws can support children to find the number bond to 10.

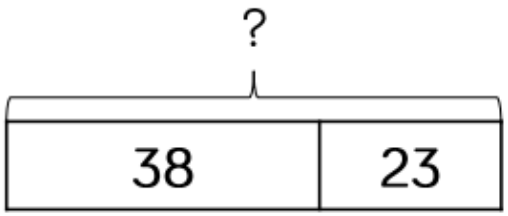
Skill: Add two 2-digit numbers to 100

Year: 2/3

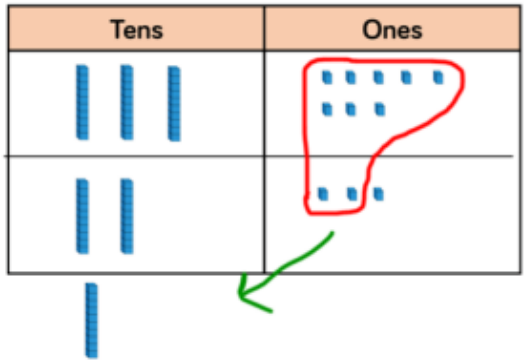




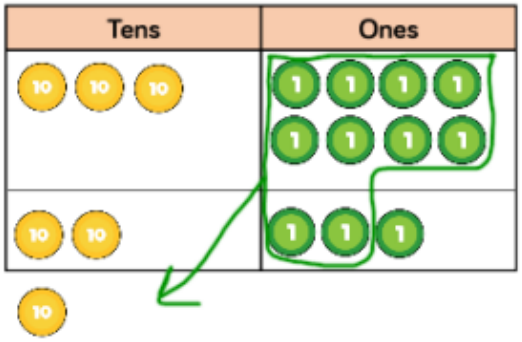




$$38 + 23 = 61$$



$$\begin{array}{r} 38 \\ +\ 23 \\ \hline 61 \\ \hline 1 \end{array}$$

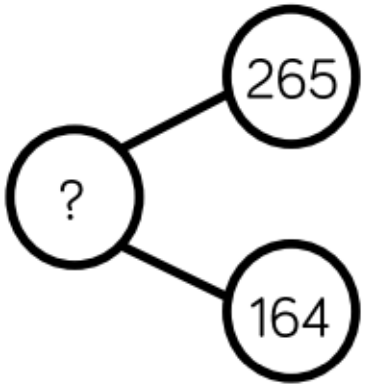


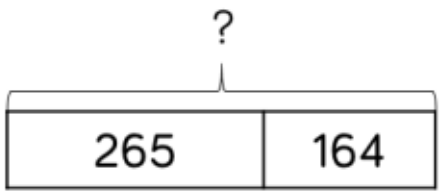
At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

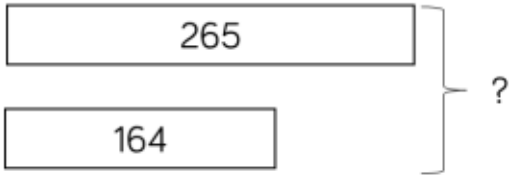
Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

Skill: Add numbers with up to 3 digits

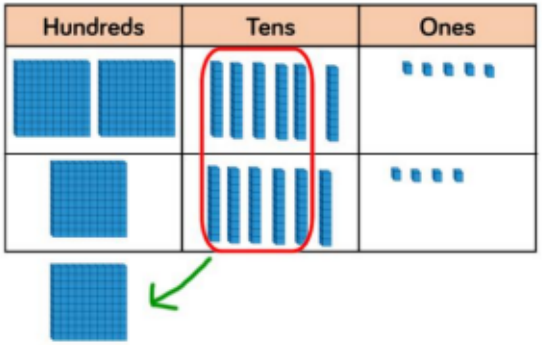
Year: 3



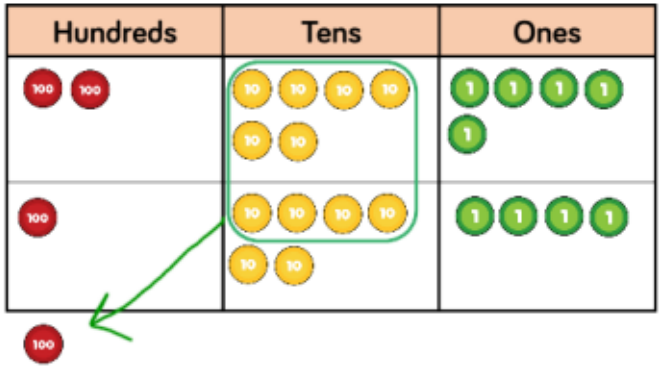




$$265 + 164 = 429$$



$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ \hline 1 \end{array}$$



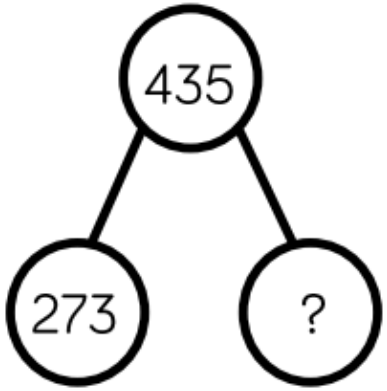
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

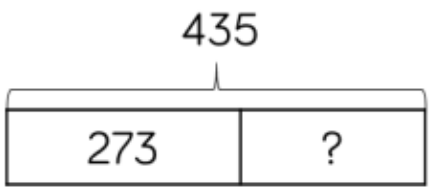
Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

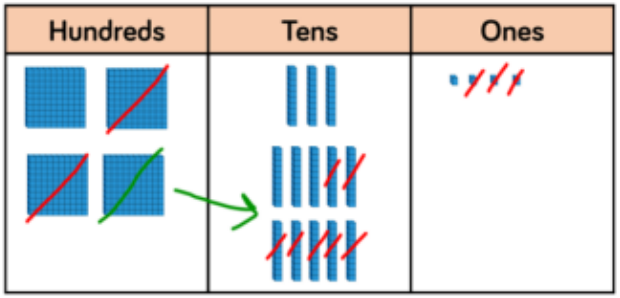
Skill: Subtract numbers with up to 3 digits

Year: 3

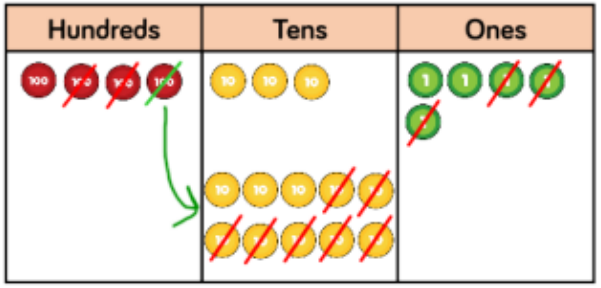




435 − 273 = 262



$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}\cancel{3}5 \\ -\ 273 \\ \hline 262 \end{array}$$



Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Year 4 Addition and Subtraction

Objective

• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
• estimate and use inverse operations to check answers to a calculation
• solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Vocabulary

Addition

add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, „carry", expanded, compact, thousands, hundreds, digits, inverse

Subtraction

equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse

Key Skill

Addition

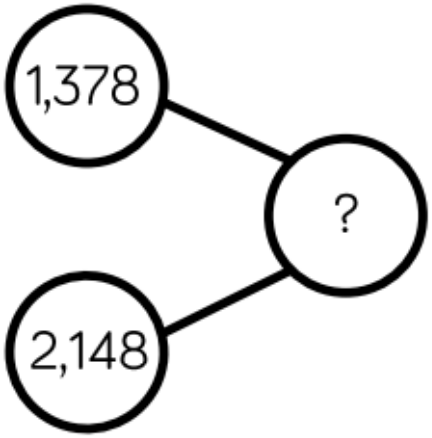
• Select most appropriate method: mental, jottings or written and explain why.
• Recognise the place value of each digit in a four-digit number.
• Round any number to the nearest 10, 100 or 1000.
• Estimate and use inverse operations to check answers.
• Solve 2-step problems in context, deciding which operations and methods to use and why.
• Find 1000 more or less than a given number.
• Continue to practise a wide range of mental addition strategies, ie. number bonds, add the nearest multiple of 10, 100, 1000 and adjust, use near doubles, partitioning and recombining.
• Add numbers with up to 4 digits using the formal written method of column addition.
• Solve 2-step problems in contexts, deciding which operations and methods to use and why.
• Estimate and use inverse operations to check answers to a calculation.

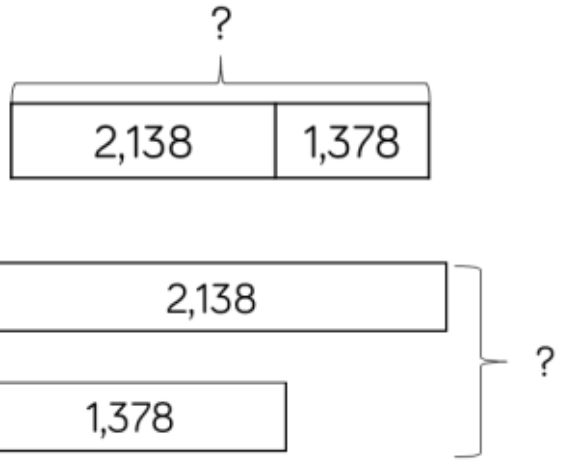
Subtraction

• Subtract by counting on where numbers are close together or they are near to multiples of 10, 100 etc.
• Children select the most appropriate and efficient methods for given subtraction calculations.
• Estimate and use inverse operations to check answers.
• Solve addition and subtraction 2-step problems, choosing which operations and methods to use and why.
• Solve simple measure and money problems involving fractions and decimals to two decimal places.
• Find 1000 more or less than a given number.
• Count backwards through zero, including negative numbers.
• Recognise place value of each digit in a 4-digit number Round any number to the nearest 10, 100 or 1000
• Solve number and practical problems that involve the above, with increasingly large positive numbers.

Skill: Add numbers with up to 4 digits

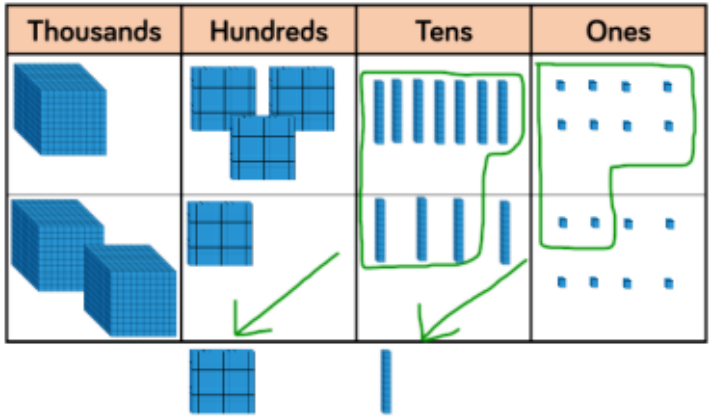
Year: 4





	1	3	7	8
+	2	1	4	8
	3	5	2	6
		1	1	

1,378 + 2,148 = 3,526



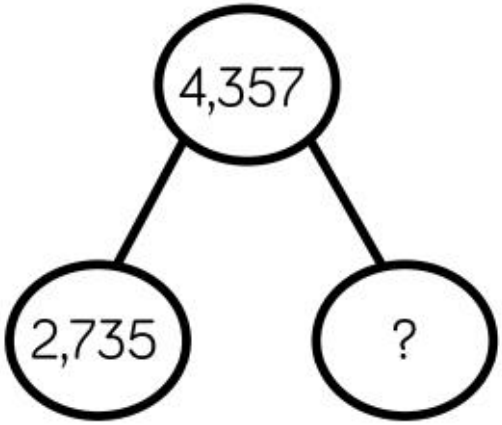
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

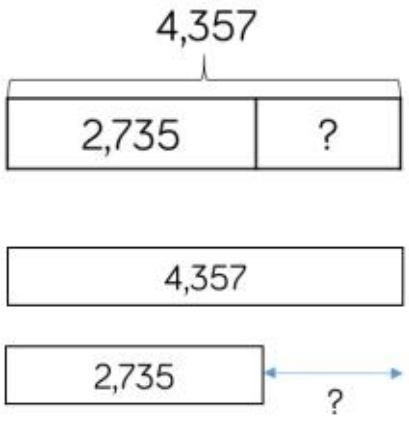
Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Skill: Subtract numbers with up to 4 digits

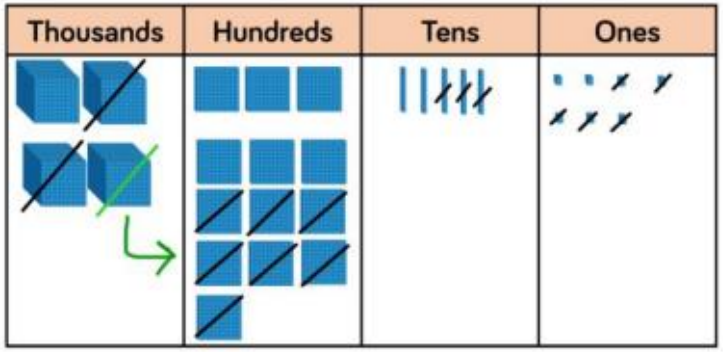
Year: 4

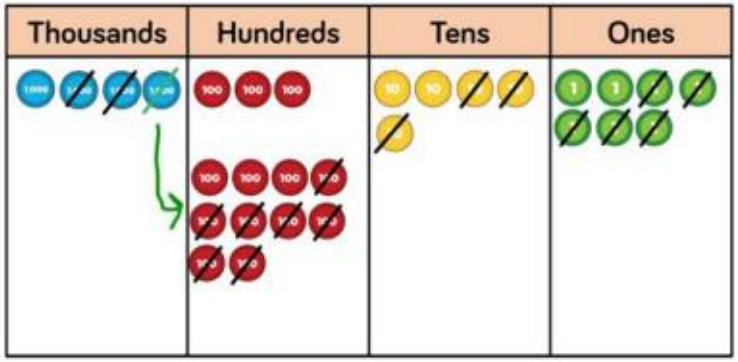




$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}357 \\ -\ 2735 \\ \hline 1622 \end{array}$$

$$4{,}357 - 2{,}735 = 1{,}622$$





Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Year 5 Addition and Subtraction

Objective

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

Vocabulary

Addition

add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, „carry", expanded, compact, vertical, thousands, hundreds, digits, inverse & decimal places, decimal point, tenths, hundredths, thousandths

Subtraction

equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse, tenths, hundredths, decimal point, decimal

Key Skill

Addition

• Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies ie. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds.

• Use rounding to check answers and accuracy.

• Solve multi-step problems in contexts, deciding which operations and methods to use and why.

• Read, write, order and compare numbers to at least 1 million and determine the value of each digit.

• Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.

• Add numbers with more than 4 digits using formal written method of columnar addition.

Subtraction

• Subtract numbers mentally with increasingly large numbers .

• Use rounding and estimation to check answers to calculations and determine, in a range of contexts, levels of accuracy .

• Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.

• Read, write, order and compare numbers to at least 1 million and determine the value of each digit.

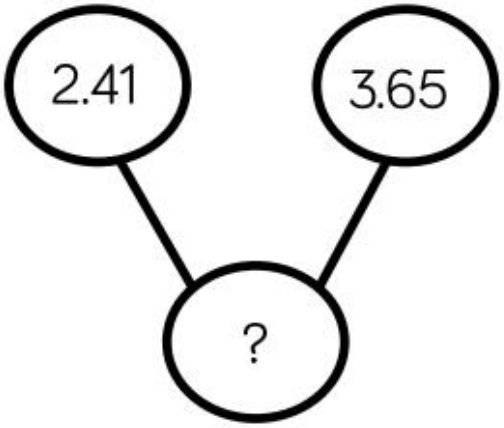
• Count forwards or backwards in steps of powers of 10 for any given number up to 1 million.

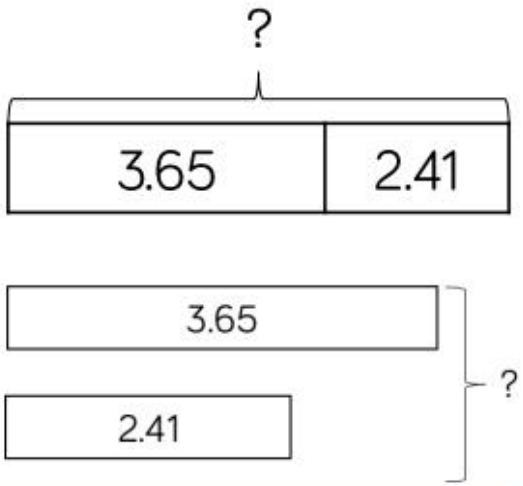
• Interpret negative numbers in context, counting forwards and backwards with positive and negative integers through 0.

• Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.

Skill: Add with up to 3 decimal places

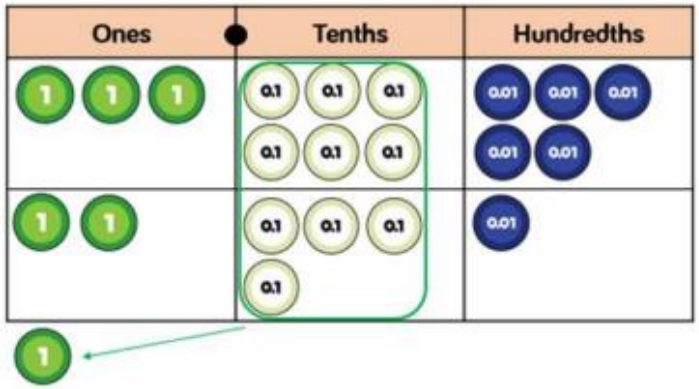
Year: 5

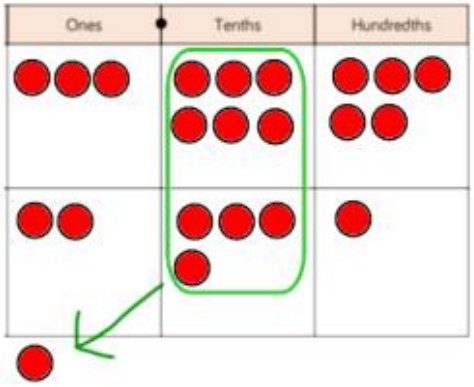




$$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ \hline 1 \end{array}$$

$$3.65 + 2.41 = 6.06$$



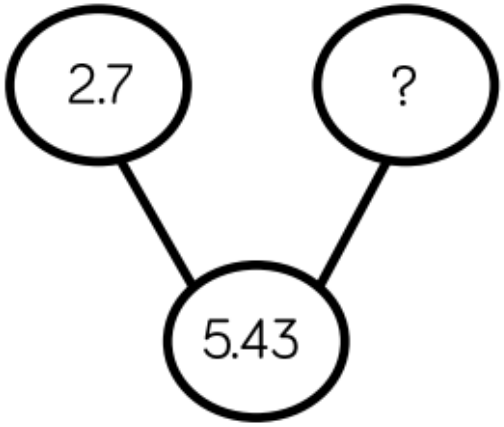


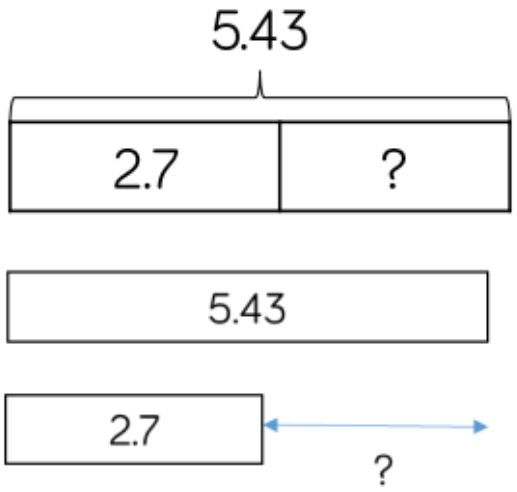
Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Skill: Subtract with up to 3 decimal places

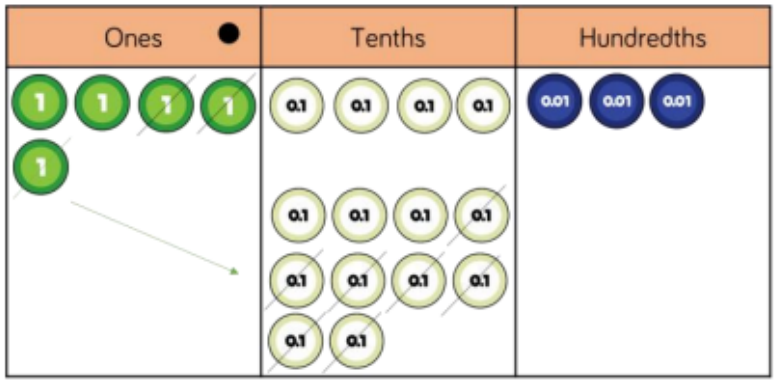
Year: 5

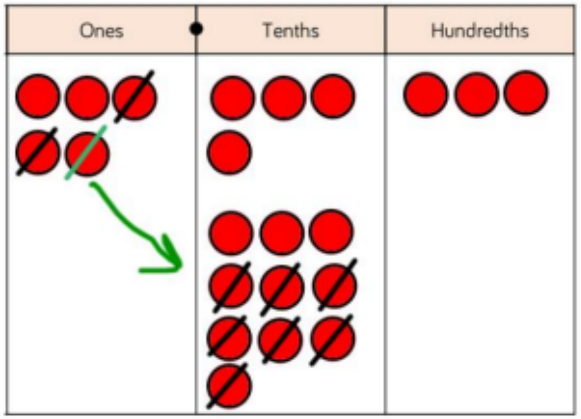




$$\begin{array}{r} {}^{4}\cancel{5}.{}^{1}43 \\ -\ 2.7 \\ \hline 2.73 \end{array}$$

$$5.43 - 2.7 = 2.73$$





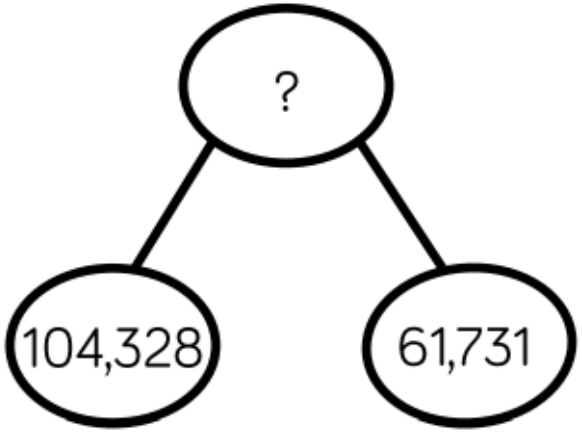
Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

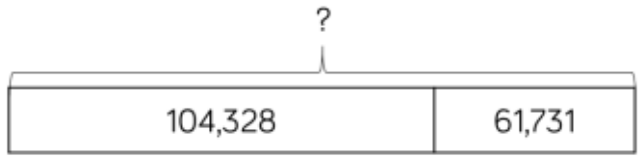
Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

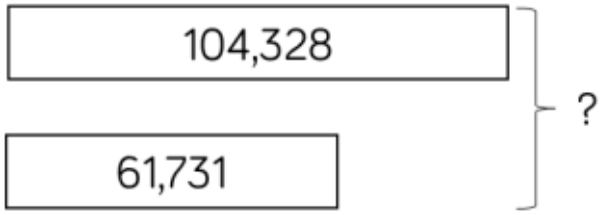
Year 6 Addition and Subtraction	
Objective	**Key Skill**
• perform mental calculations, including with mixed operations and large numbers • use their knowledge of the order of operations to carry out calculations involving the four operations • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	**Addition** • Perform mental calculations, including with mixed operations and large numbers, using and practising a range of mental strategies. • Solve multi-step problems in context, deciding which operations and methods to use and why. • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. • Read, write, order and compare numbers up to 10 million and determine the value of each digit. • Round any whole number to a required degree of accuracy. • Pupils understand how to add mentally with larger numbers and calculations of increasing complexity. **Subtraction** • Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why. • Read, write, order and compare numbers up to 10 million and determine the value of each digit • Round any whole number to a required degree of accuracy • Use negative numbers in context, and calculate intervals across zero. • Children need to utilise and consider a range of mental subtraction strategies, jottings and written methods before choosing how to calculate.
Vocabulary	
Addition add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, „carry", expanded, compact, vertical, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths **Subtraction** equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse, tenths, hundredths, decimal point, decimal	

Skill: Add numbers with more than 4 digits

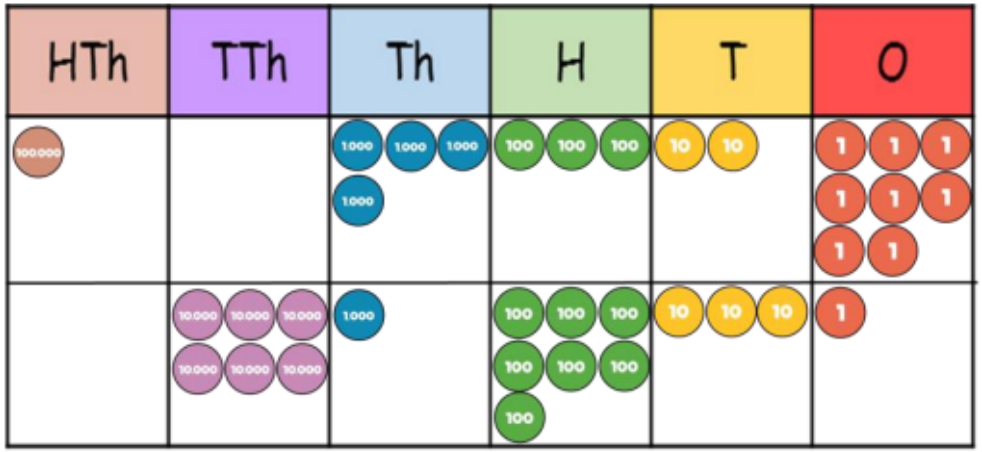
Year: 5/6







104,328 + 61,731 = 166,059



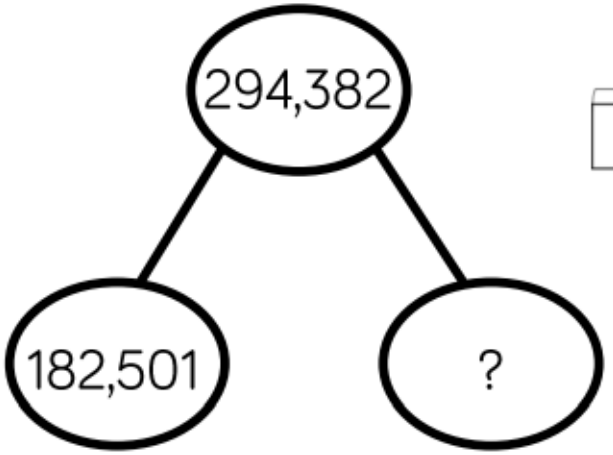
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
		1			

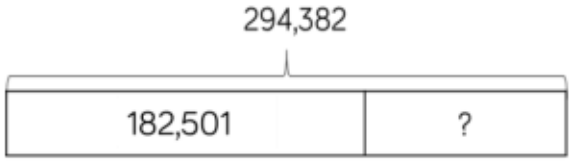
Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

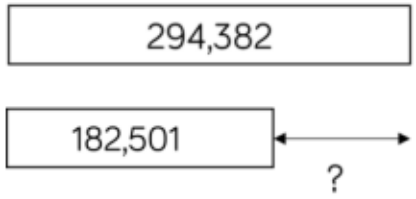
At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

Skill: Subtract numbers with more than 4 digits

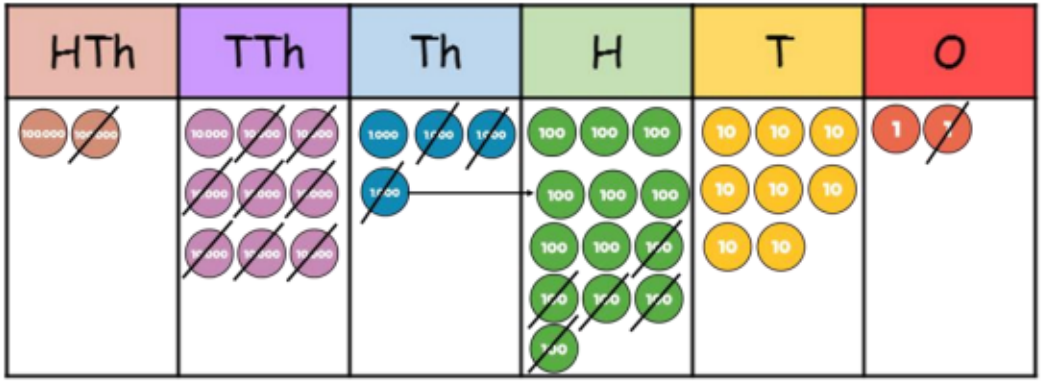
Year: 5/6







294,382 − 182,501 = 111,881



	2	9	$\cancel{3}\ 4$	$^{1}3$	8	2
−	1	8	2	5	0	1
	1	1	1	8	8	1

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.