Written Methods: Addition and Subtraction.

Children need to be taught and encouraged to use written methods for addition and subtraction when larger numbers are involved and when significant place value boundaries are crossed with the renaming of digits. This is to ensure they select the most appropriate method for the numbers involved and that a formal written method is more efficient than solving the problem mentally.

They will use the methods taught to solve word problems; visualising the problems using the bar model. The bar model method, including the part-whole model, is used at each stage of the CPA approach. The process begins with pupils exploring problems via concrete objects. Pupils then progress to drawing pictorial diagrams, and then to abstract algorithms and notations (such as the + and symbols).

Worded problems will be presented with a range of vocabulary linking to addition and subtraction.

<u>Addition:</u> sum, altogether, all, in all, together, total, total number, add, increase, increased by and more than.

<u>Subtraction:</u> minus, subtract, less than, take away, left. Smaller, least, count back, difference between, count on, negative and decrease.

Air Balloon Hill
PRIMARY
School

Written Calculations: Addition and Subtraction

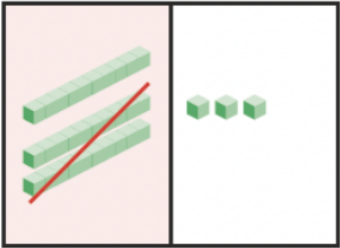| KSI	LKS2	UKS2
1. Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) **2. Add 2-digit numbers and ones. Add 2-digit number and tens. Add two 2-digit numbers. Add three 1-digit numbers.** *Through practical activities in meaningful contexts and informal written methods in Year 1, progressing to column method where appropriate in Year 2.*	*3.* **Add and subtract numbers with up to three digits, using formal written methods of column addition and subtraction where appropriate.** *Add money using both £ and pence in practical contexts.* *4.* **Add numbers with up to 4 digits, using the formal written method of columnar addition.** *Estimate and use inverse operations to check answers to a calculation.* *Add money using both £ and pence in practical contexts.*	**5. Continue to use column method, adding and subtracting numbers with more than 4 digits.** *Addition and subtraction of money and decimals.* **6. Add and subtract several numbers of increasing complexity using columnar addition.** *Use estimation to check answers to calculation and to determine, in the context of a problem, levels of accuracy.*

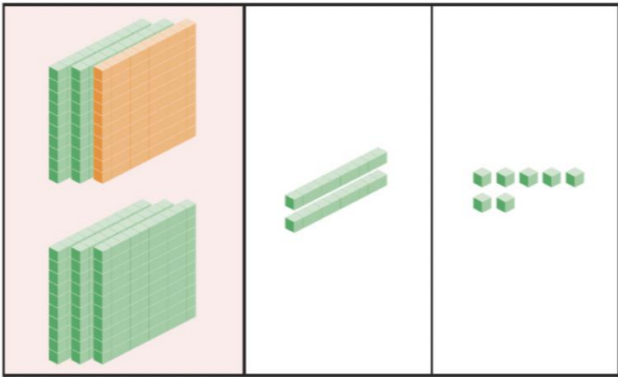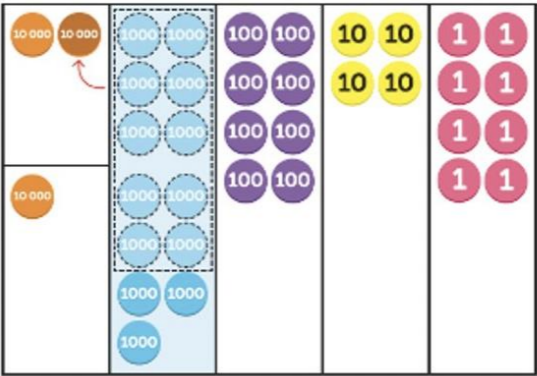| Concrete | *Use Base 10 and place value mats with-2 digit numbers where mental methods are not appropriate. Expanded methods should be used initially (when renaming) before moving onto compact column method.*

Subtract the tens.
3 tens − 2 tens = 1 ten

37 − 24 = 13 | *Use Base 10 and place value mats, starting without renaming, moving towards the renaming of any digit or all digits.*

278 + 349 = 627 | *Use place value counters and place value mats to model and solve the renaming of digits.* |

Pictoral

Continue to use place value charts and base 10 or place value counters. Expanded method can be used to show renaming.
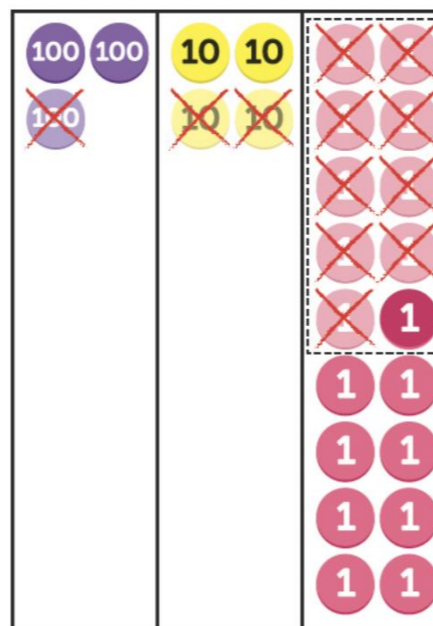
Add the tens.
1 ten + 1 ten + 1 ten = 3 tens
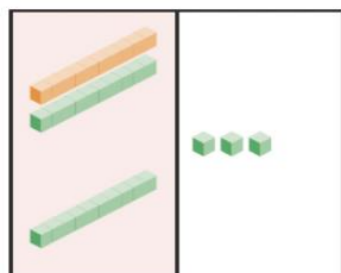
	tens	ones
	1	5
+	1	8
	1	3
+	2	0
	3	3

15 + 18 = 33

Place value counters are used to show the renaming of the ones, tens, hundreds and thousands digit.

$$358$$
$$300 \qquad 40 \qquad 18$$
$$-\,100 \quad -\,20 \quad -\,9$$
$$\overline{200} \quad \overline{\;20\;} \quad \overline{\;9\;}$$

$$3 \;\; \overset{4}{\cancel{5}} \;\; \overset{18}{\cancel{8}}$$
$$-\;1\;\;\;2\;\;\;9$$
$$\overline{\;\;2\;\;\;2\;\;\;9\;\;}$$

358 − 129 = 229

Continue to use place value counters for larger numbers, particularly when renaming. Children can use whiteboards to draw this.

Which is more expensive, 🎲 or ▭? How much more expensive is it?

£1.30	1 0.1 0.1 0.1
£0.80	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

£ 1 . 3 0
− £ 0 . 8 0

£1.30	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1
£0.80	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

£ $\overset{0}{\cancel{1}}$. $\overset{13}{\cancel{3}}$ 0
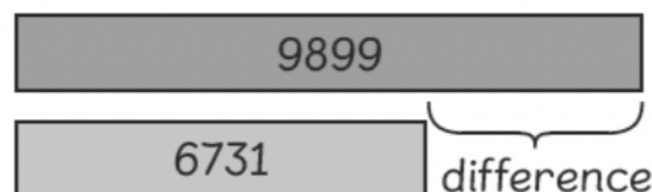− £ 0 . 8 0
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Abstract

Where mental methods are not appropriate, children should be encouraged to use column method with scaffold to support to begin with, before moving onto squared paper for their written methods.

Children are presented with addition and subtraction calculations, often in the context of worded and missing number problems. Bar models are used to support dissecting the problem to determine if addition or subtraction is needed. See 'Sapphire Calculators' in this guide to see how column method is presented in squared paper maths books.

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What is the total population of Kingstown and Queenstown?