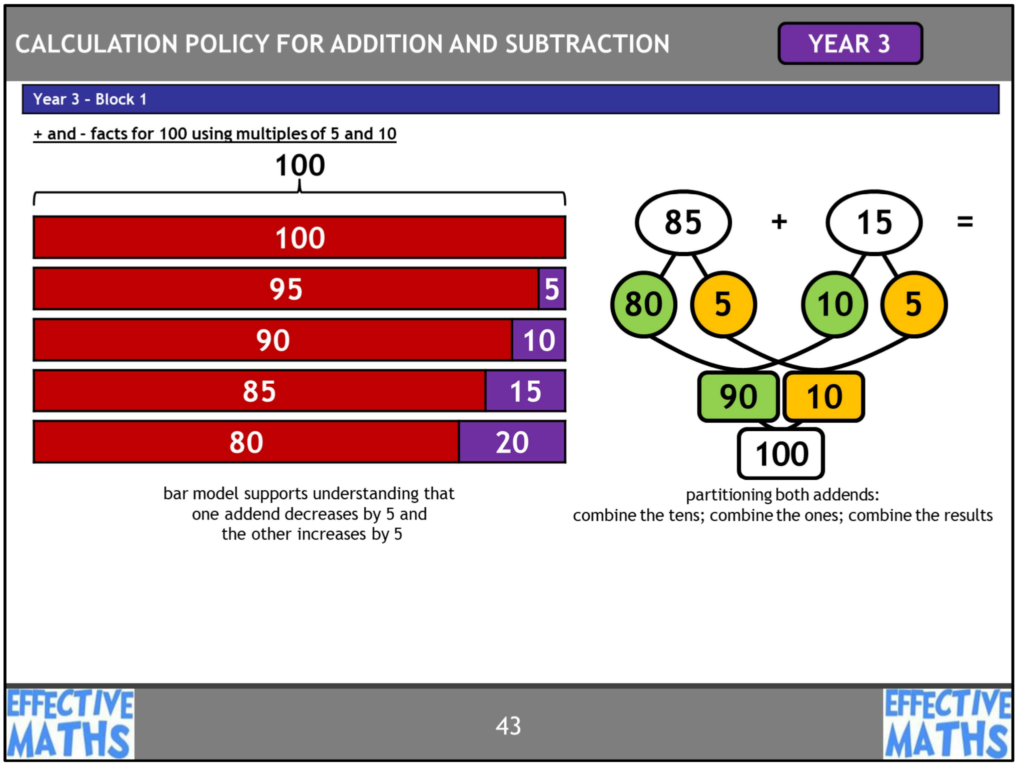
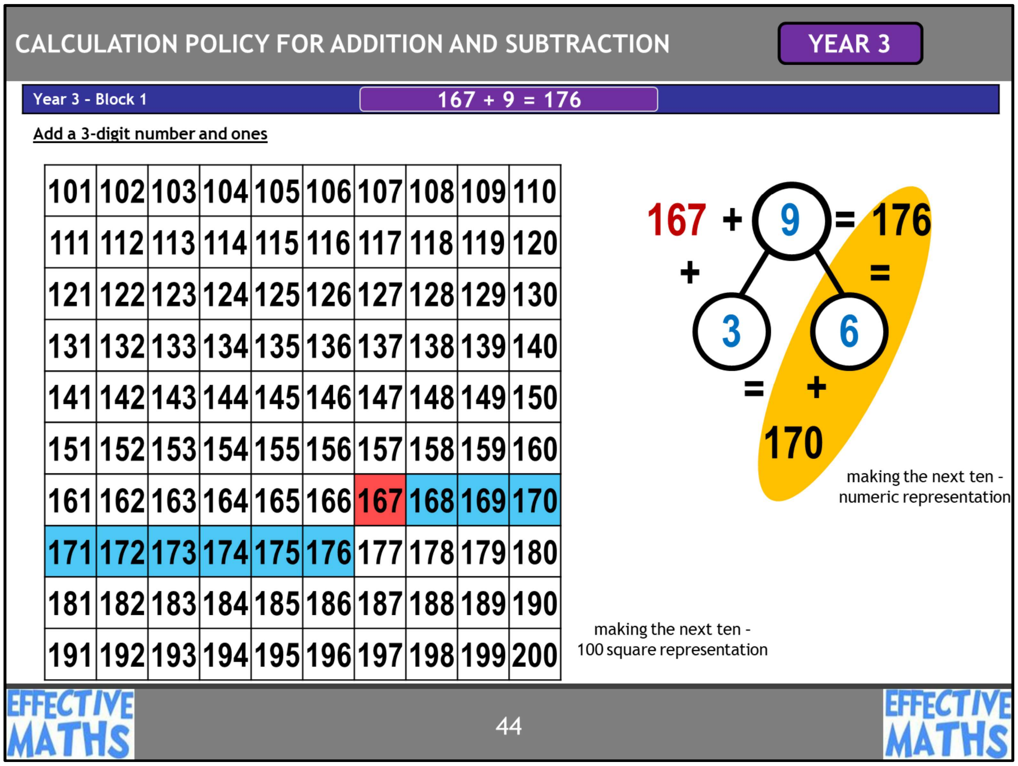


BLOCK 1

<u>+ and - facts for 100 using multiples of 5 and 10</u>

Teaching needs to stress how to avoid common errors when calculating complements to 100, eg:

65 + 45 = 110 instead of 100. See notes in lesson.



<u>Add a 3-digit number and ones</u>
Making the next ten, eg:
167 + 9 = 170 + 3 + 6.

CALCULATION POLICY FOR ADDITION AND SUBTRACTION

YEAR 3

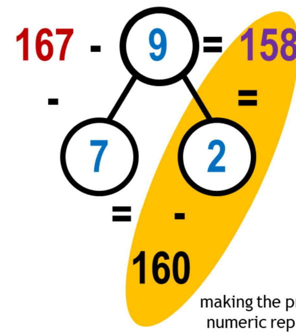
Year 3 - Block 1

167 - 9 = 158

Subtract ones from a three-digit number

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

making the previous ten - 100 square representation

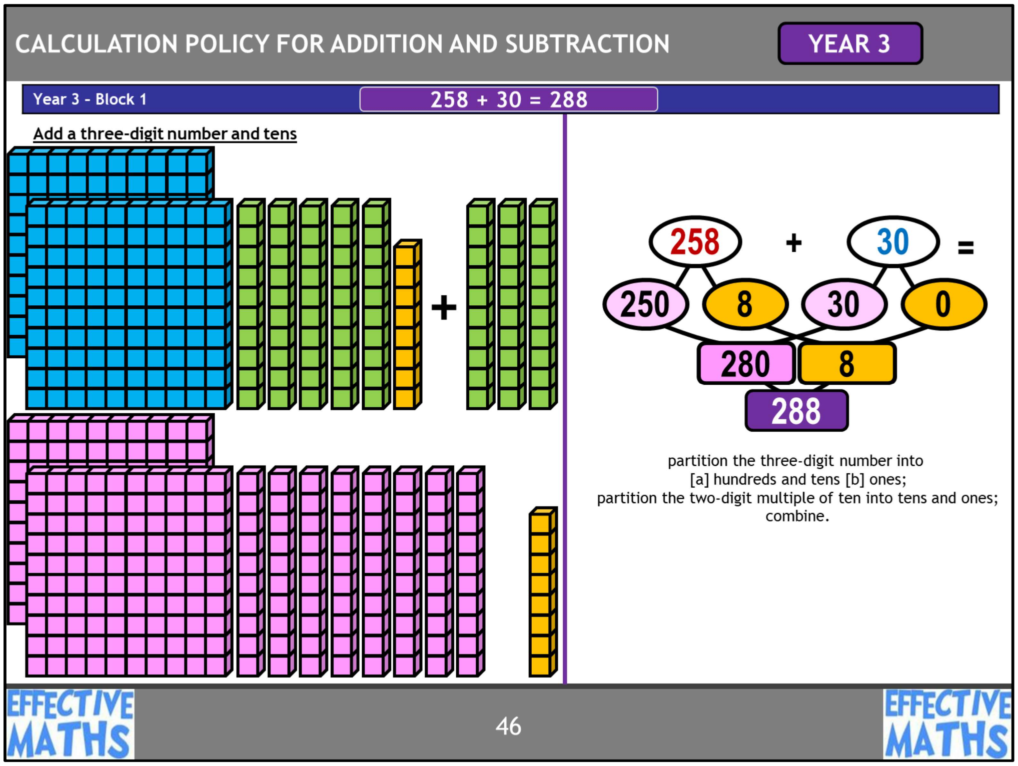


making the previous ten numeric representation

Subtract ones from a three-digit number

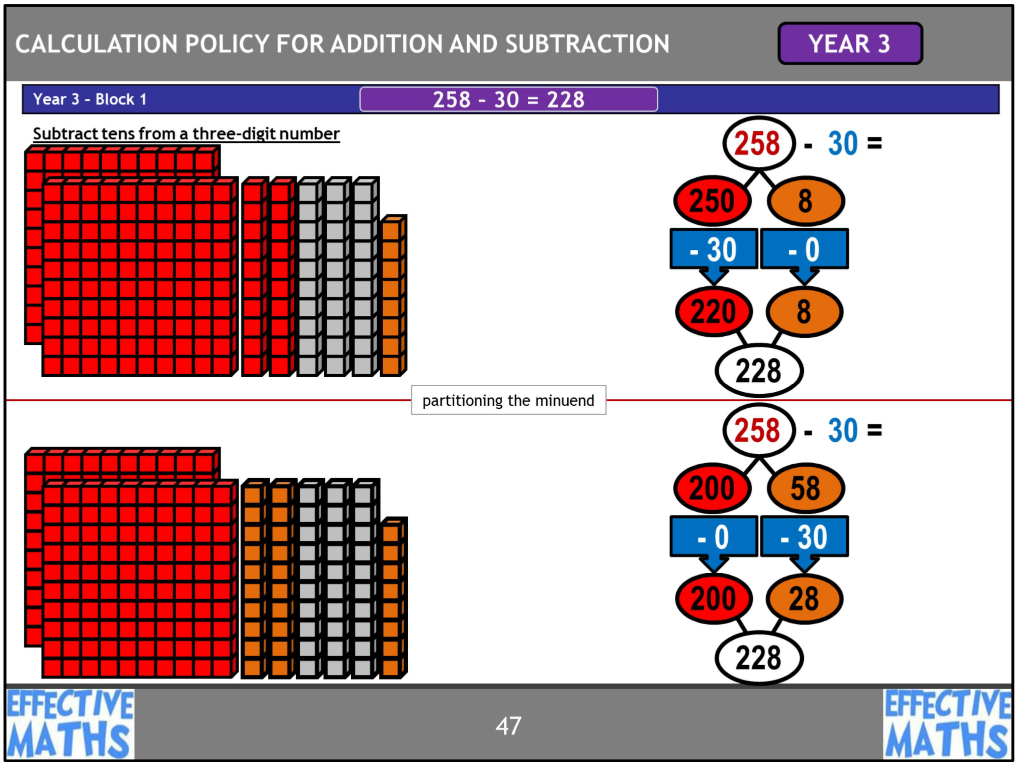
Making the previous ten, eg:

167 – 9 = 167 – 7 – 2.



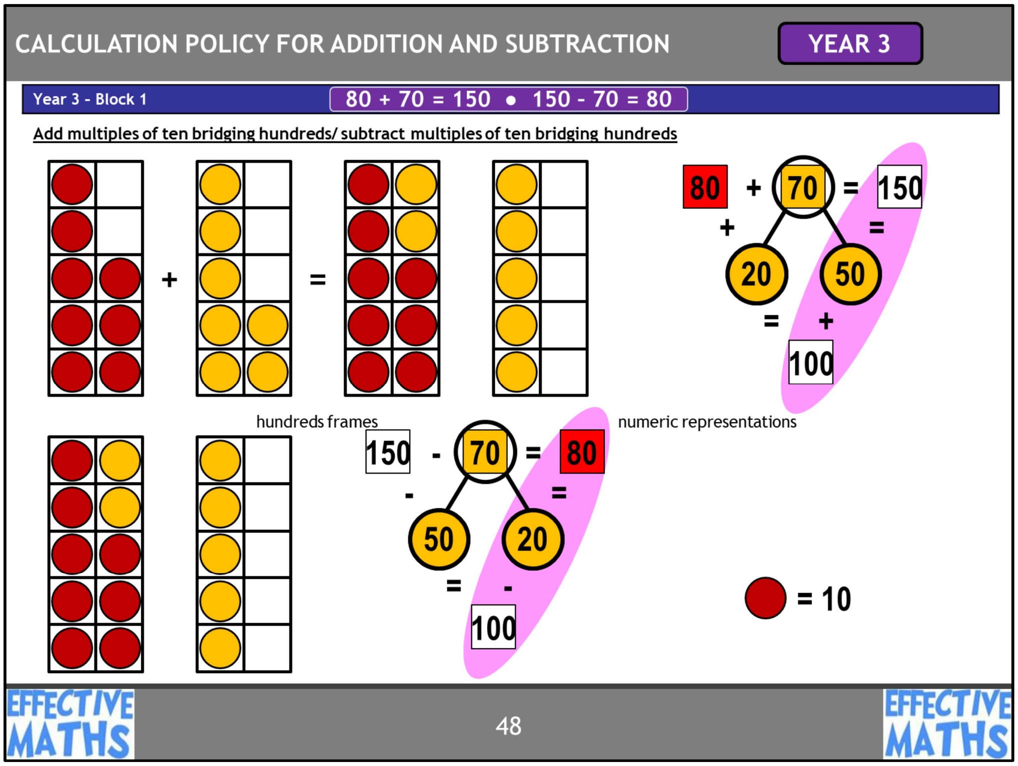
<u>Add a three-digit number and tens</u>
For addition: partition the three-digit number into hundreds and tens and ones, eg:
258 + 30 = 250 + 8 + 30 = 280 + 8.

The point is to create two multiples of ten from both of the addends. One is already a multiple of ten, so we only need to adjust the other.
Counting on in tens is also helpful.



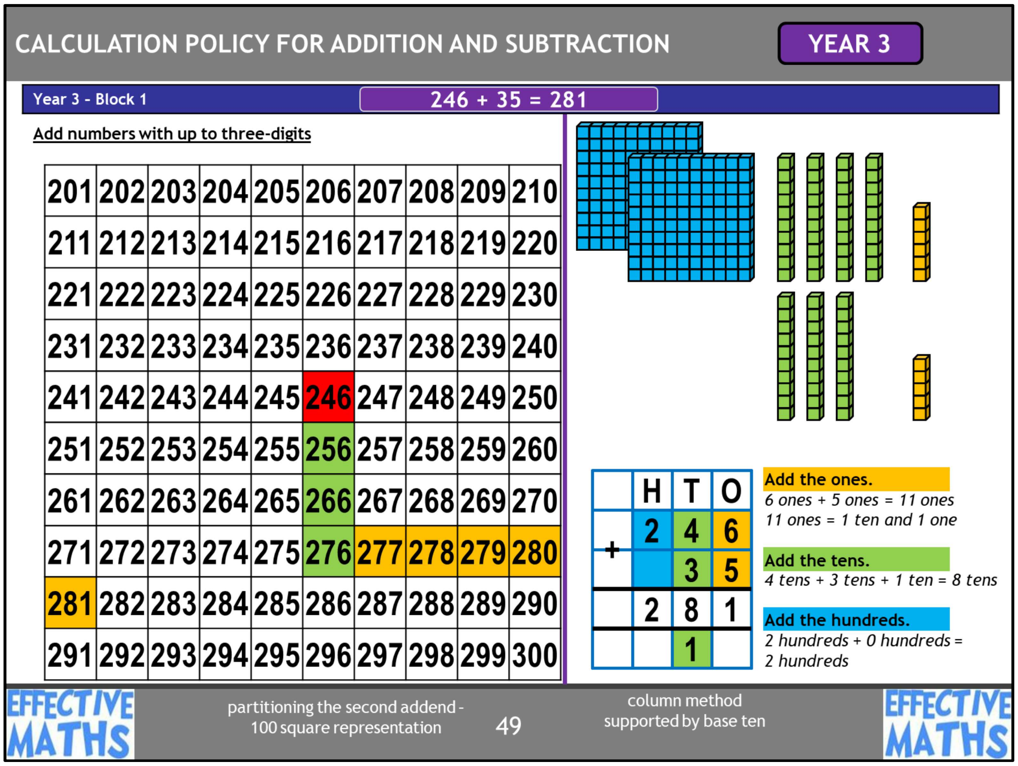
<u>Subtract tens from a three-digit number</u>
For subtraction: partition the minuend, eg:
258 – 30 = 58 – 30 + 200 (the second example above).

The examples above illustrate taking the subtrahend from different parts of the partitioned minuend.



<u>Adding multiples of ten</u>
Making the next hundred, eg:
80 + 60 = 80 + 20 + 40.

If children are not confident with making the next/previous ten, consider focusing on securing this rather than making the next/previous hundred. The ability to bridge through ten is fundamental to securing effective calculation ability.



Add numbers with up to three-digits
(three-digit + two-digit)
Two methods:
- partitioning the second addend;
- column method.

NB In Year 2 children added 2 two-digit numbers. The next step here is to add a three-digit number to a two-digit. In Block 2 they will add 2 three-digit numbers.

Language for the compact column method
The use of accurate language is essential to ensure conceptual understanding of the column method.
Avoid terms like ‘units’ and ‘carry’.

Link to children’s understanding of how base 10 works, perhaps revisiting the trading games played in Y2 place value unit 1.

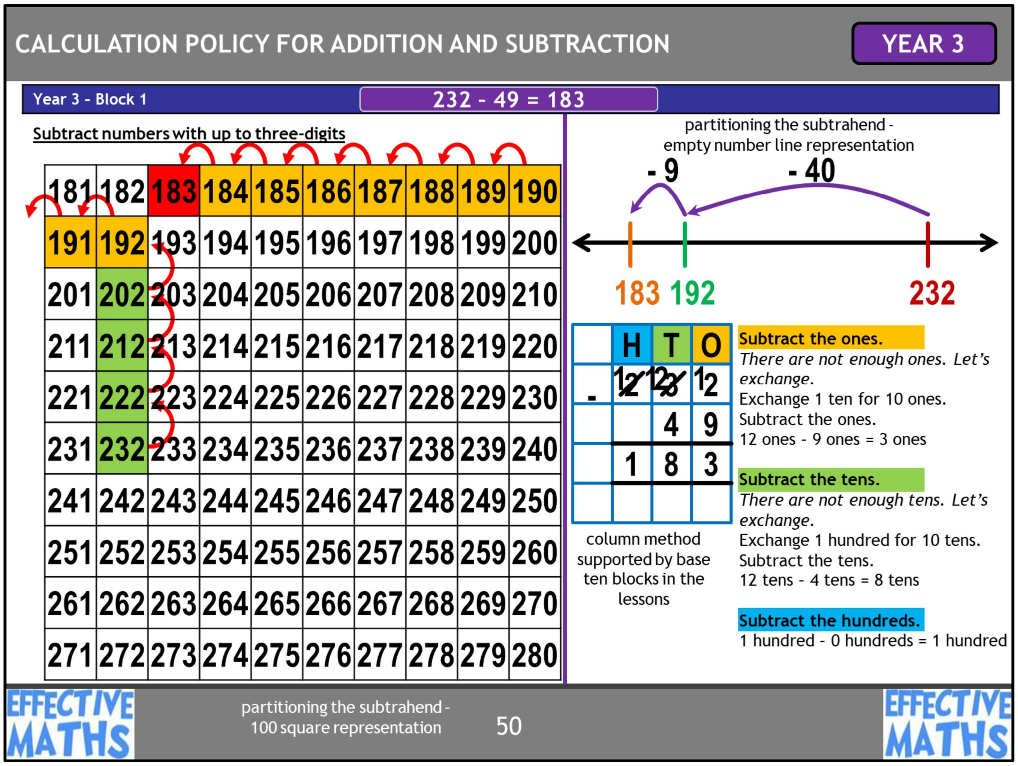
Say:
Add the ones.
6 ones and 5 ones makes 11 ones.
11 ones is the same as 1 ten and 1 one.

Add the tens.

4 tens and 3 tens and 1 ten makes 8 tens.
As you say the above, write:
4<u>0</u> + 3<u>0</u> + 1<u>0</u>= 8<u>0</u>
8<u>0</u> = 80

You are writing and underlining the digit zero as you say 'tens'.
8 tens = 8<u>0</u>

Add the hundreds.
2 hundreds and no hundreds makes 2 hundreds.



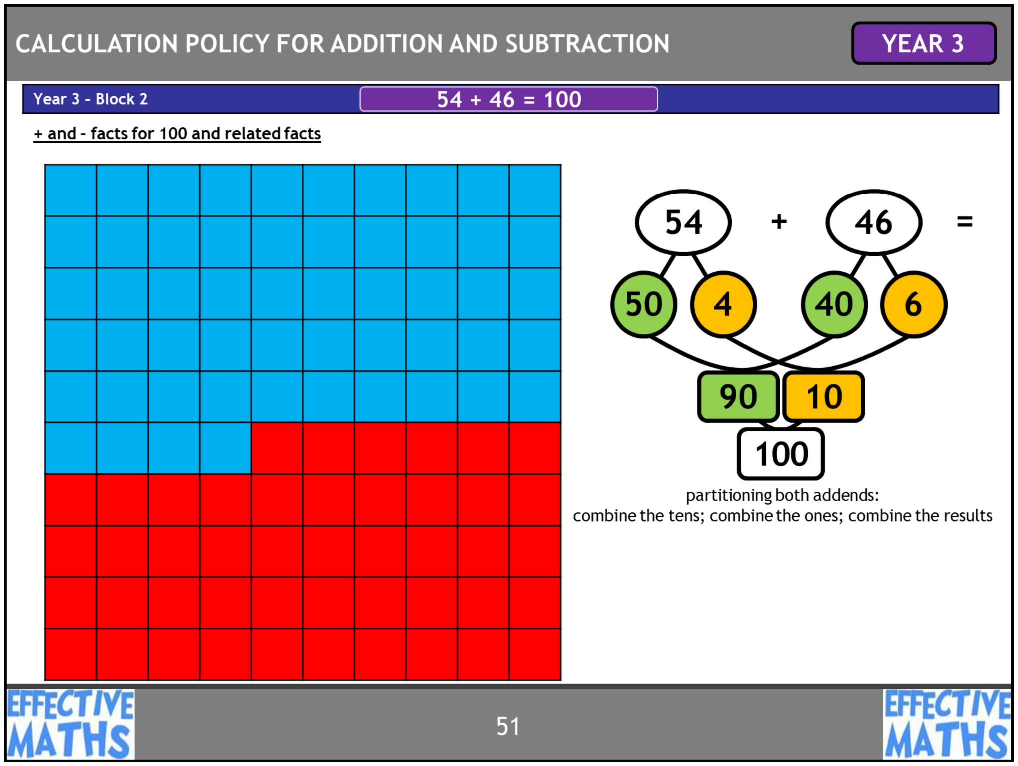
<u>Subtract numbers with up to three-digits</u>
(three-digit - two-digit)
Three methods:

- using hundred square;
- counting back on empty number line;
- column method.

<u>Language for the compact column method</u>

As for addition, accurate use of language is essential to ensure <u>conceptual</u> understanding of the column method.
Do not use the term 'borrow'.
There are not enough ones in the situation *2 ones take away 9 ones*. So we need some more ones. Let's exchange/swap 1 ten for 10 ones. Now we have 12 ones.
12 ones take away 9 ones equals 3 ones.

Similarly, there are not enough tens in the situation *2 tens take away 4 tens*. We need more tens. Let's exchange/swap 1 hundred for 10 tens. Now we have 12 tens.
12 tens take away 8 tens equals 4 tens.



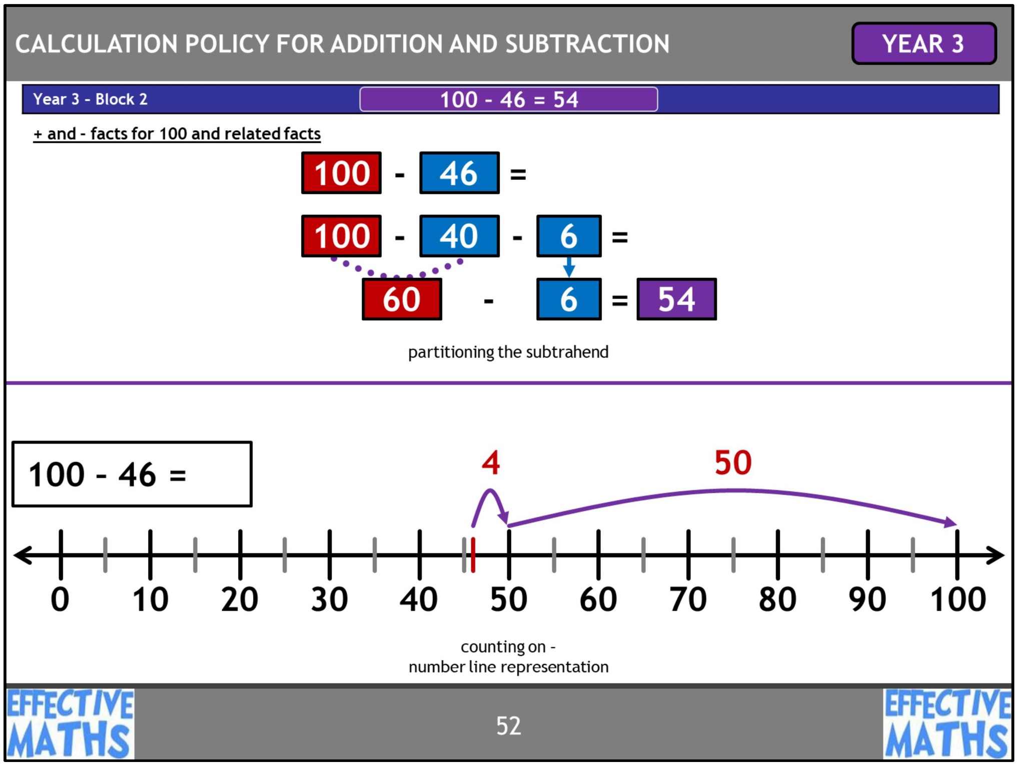
BLOCK 2

<u>+ and - facts for 100 and related facts</u>

For addition:

- partitioning both addends into ten and ones and combining parts, eg:

73 + 27 = 70 + 3 + 20 + 7 = 90 + 10.



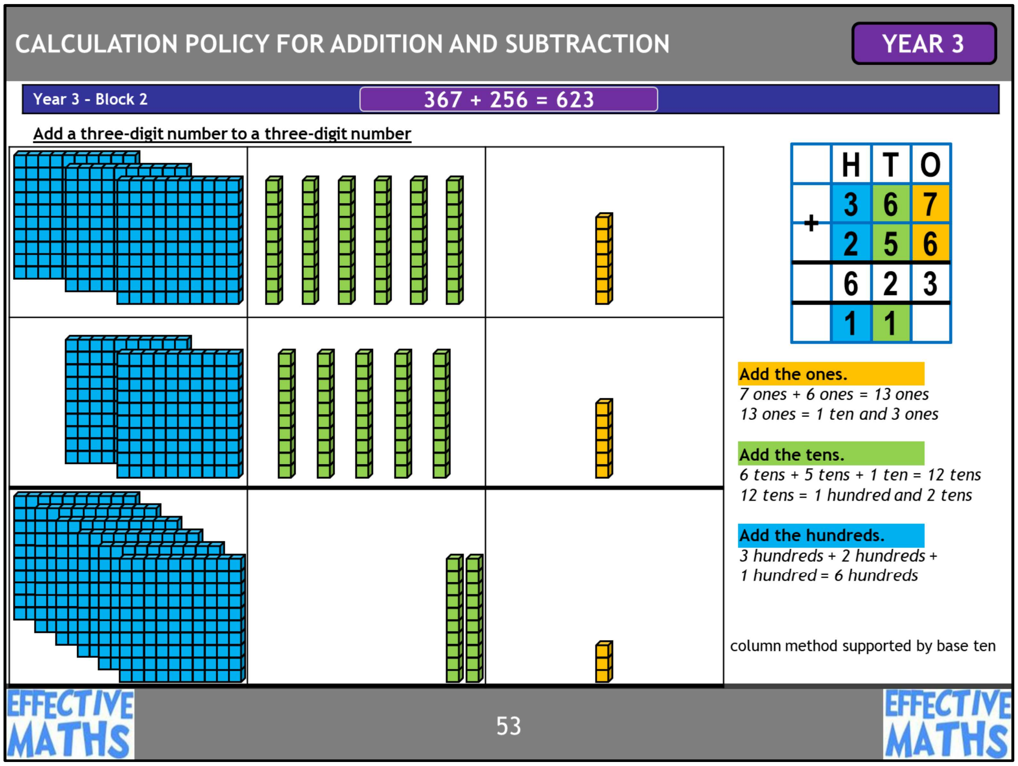
<u>+ and - facts for 100 and related facts</u>

For subtraction:

- partitioning the subtrahend, eg:

100 – 68 = 100 – 60 – 8;

- counting on with number line.



<u>Add a three-digit number to a three-digit number</u>
Column method (exchanging ones to tens and tens to hundreds).

<u>Language for the compact column method</u>
The use of accurate language is essential to ensure <u>conceptual</u> understanding of the column method.
Avoid terms like 'units' and 'carry'.

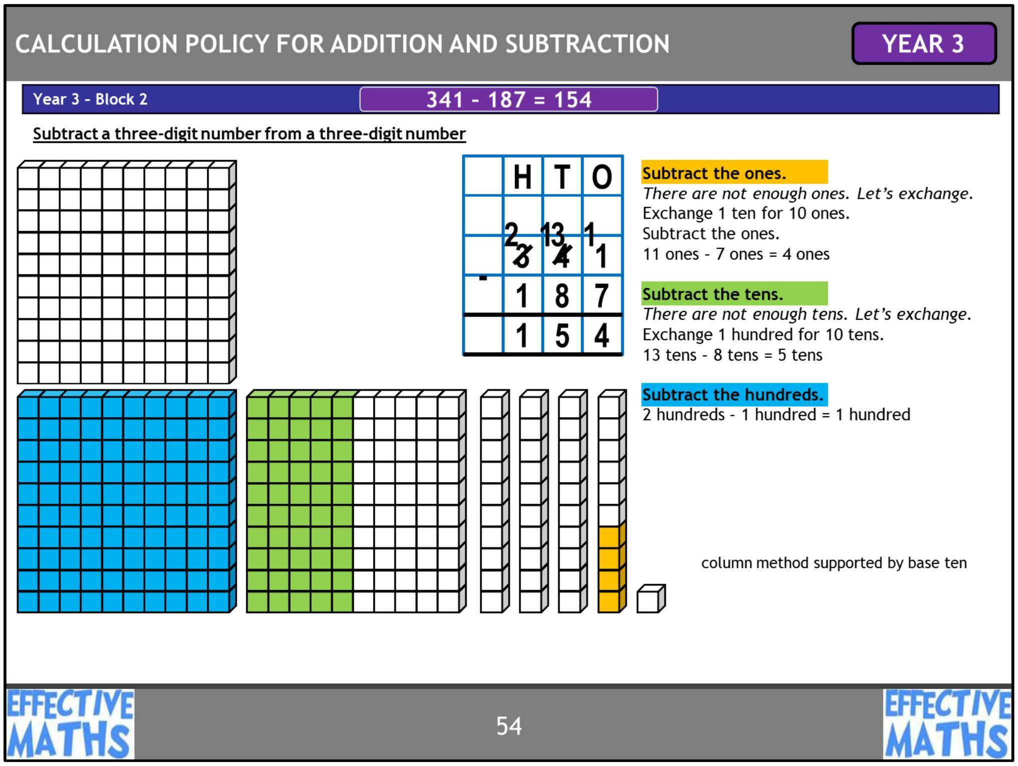
Say:
Add the ones.
7 ones and 6 ones makes 13 ones.
13 ones is the same as 1 ten and 3 ones.

Add the tens.
6 tens and 5 tens and 1 ten makes 12 tens.
As you say the above, write:
$6\underline{0} + 5\underline{0} + 1\underline{0} = 12\underline{0}$
$12\underline{0} = 12$

You are writing and underlining the digit zero as you say 'tens'.
12 tens $= 12\underline{0}$

Add the hundreds.

3 hundreds and 2 hundreds and 1 hundred makes 6 hundreds.
As you say the above, write:
300 + 200 + 100 = 600

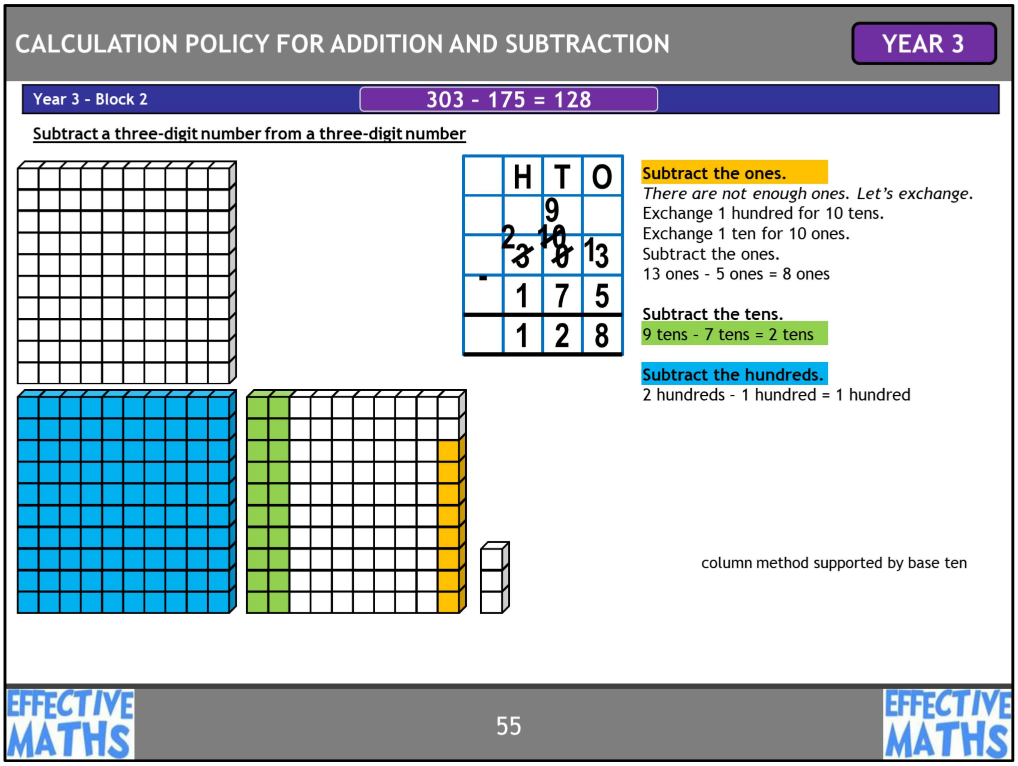


Subtract a three-digit number from a three-digit number
Column method (exchanging hundreds to tens and tens to ones).

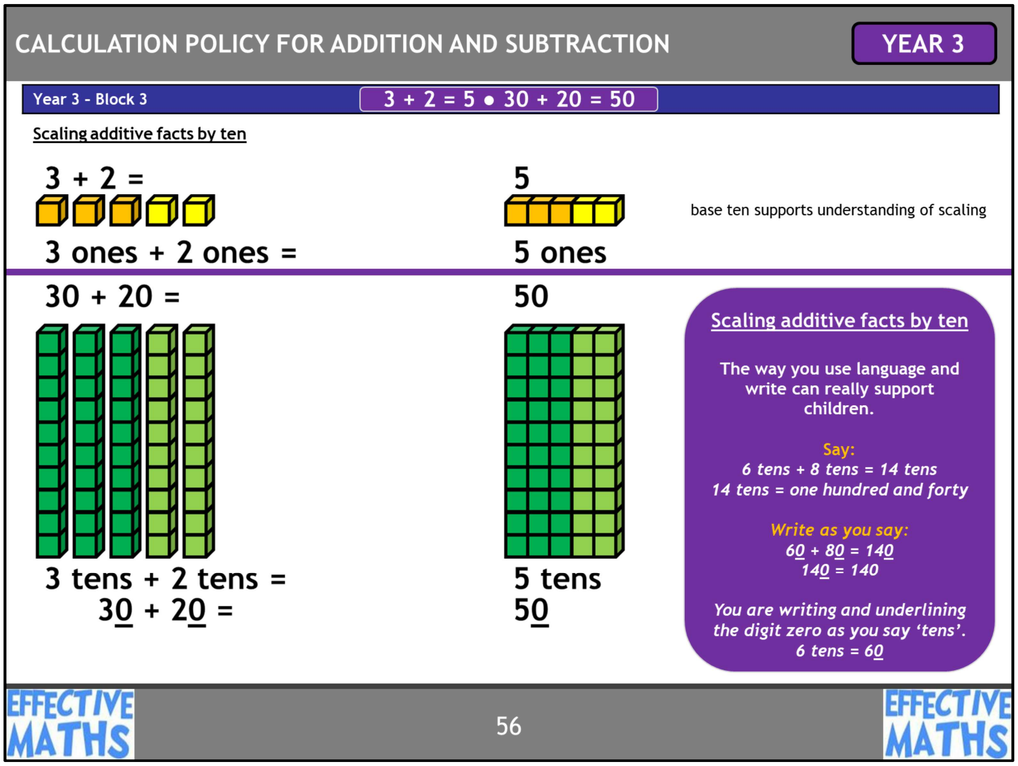
Language for the compact column method

As for addition, accurate use of language is essential to ensure conceptual understanding of the column method.
Do not use the term 'borrow'.
There are not enough ones in the situation *1 one take away 7 ones*. So we need some more ones. Let's exchange/swap 1 ten for 10 ones. Now we have 11 ones.
11 ones take away 7 ones equals 4 ones.

Similarly, there are not enough tens in the situation *3 tens take away 8 tens*. We need more tens. Let's exchange/swap 1 hundred for 10 tens. Now we have 13 tens.
13 tens take away 8 tens equals 5 tens.



<u>Subtract a three-digit number from a three-digit number</u>
Column method (exchanging hundreds to tens and tens to ones).
In this example there is an initial exchange from hundreds to tens, then tens to ones.



BLOCK 3

<u>Scaling additive facts by ten</u>
Use known facts, eg:
3 + 2 = 5 so 3 tens + 2 tens = 5 tens = 50

CALCULATION POLICY FOR ADDITION AND SUBTRACTION

YEAR 3

Year 3 - Block 3

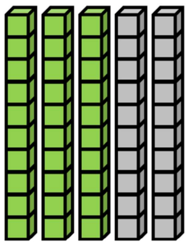
5 - 2 = 3 ● 50 - 20 = 30

Scaling additive facts by ten

5 - 2 = 3

5 ones - 2 ones = 3 ones

50 - 20 = 30



base ten supports understanding of scaling

5 tens - 2 tens = 3 tens

5<u>0</u> - 2<u>0</u> = 3<u>0</u>

EFFECTIVE MATHS

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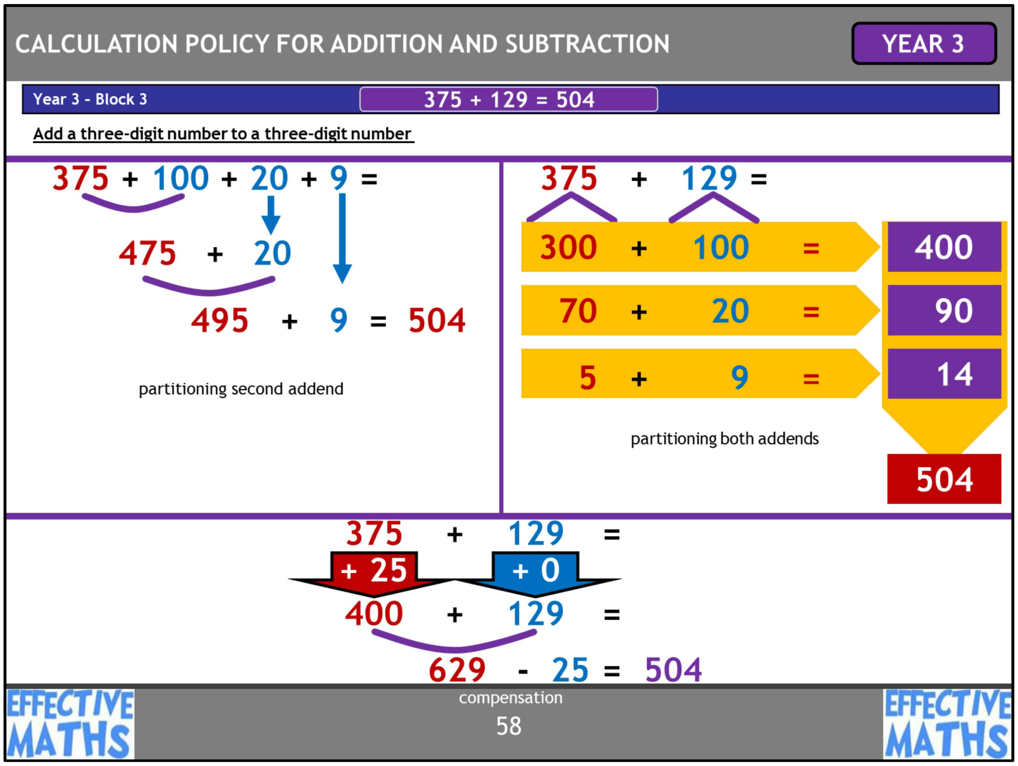
EFFECTIVE MATHS

Scaling additive facts by ten

Use known facts, eg:

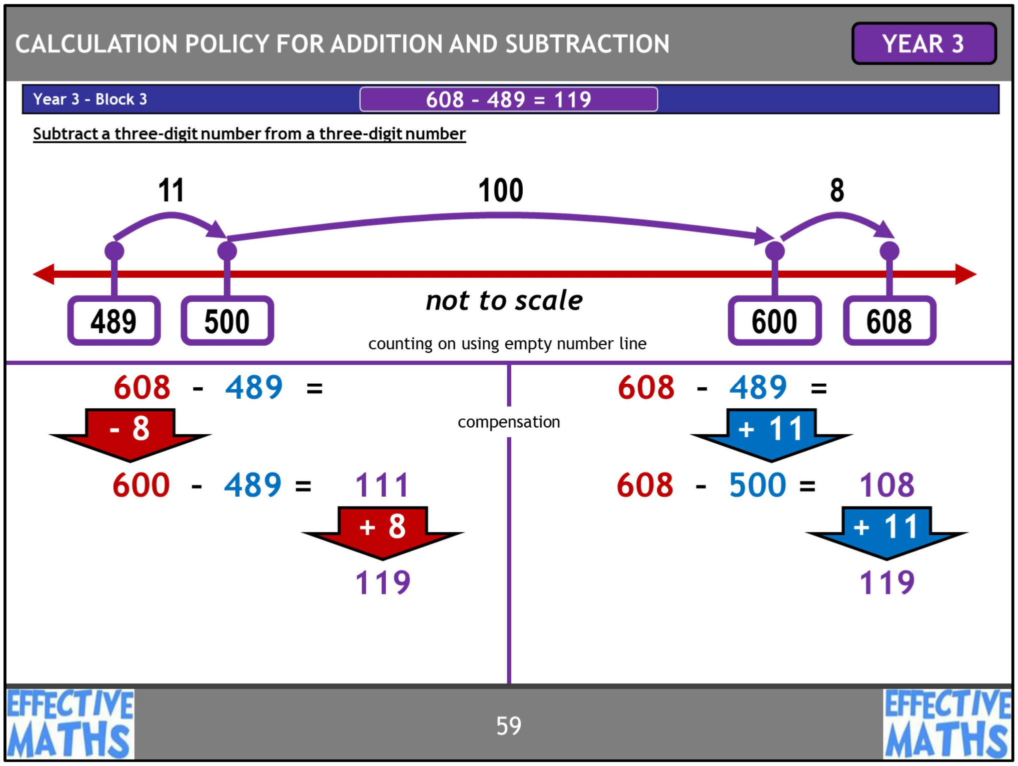
5 – 2 = 3 so 5 tens - 3 tens = 2 tens.



<u>Add a three-digit number to a three-digit number</u>

Three methods:

- partitioning to expand second addend;
- partitioning both addends;
- compensation.



Subtract a three-digit number from a three-digit number
Two methods:

- counting on using empty number line;
- compensation.

Compensation is a powerful strategy that children should be introduced to. It is a sophisticated strategy, and in subtraction children may over generalise and make errors.
Over time, teaching needs to help children see that:

- if the minuend is increased the difference will need to be decreased by the same amount;
- if the minuend is decreased the difference will need to be increased by the same amount;
- if the subtrahend is increased the difference will need to be increased by the same amount;
- if the subtrahend is decreased the difference will need to be decreased by the same amount.

These are not rules to be learnt by rote. Teaching needs to ensure children have the conceptual understanding to support why the rules work.
For example, in the first example above the minuend was **decreased**. So the resulting difference is not big enough because we have subtracted 489 from a smaller minuend: 600 instead of 608. We need to **increase** the difference by 8.

In the second example, the subtrahend is **increased**. So we have taken away more than we need to: 500 instead of 489. The initial difference (108) is therefore too small and needs to be **increased**.

We want children to be fluent with most methods. All children should be exposed to using compensation for subtraction; some children may be usefully encouraged to focus on number line methods, partitioning the subtrahend, partitioning the minuend and column method.