# Voyage

## EDUCATION PARTNERSHIP

# Maths Calculation Policy

## Reviewed September 2023

www.voyage-education.org

# Addition - Year 1  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships. Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

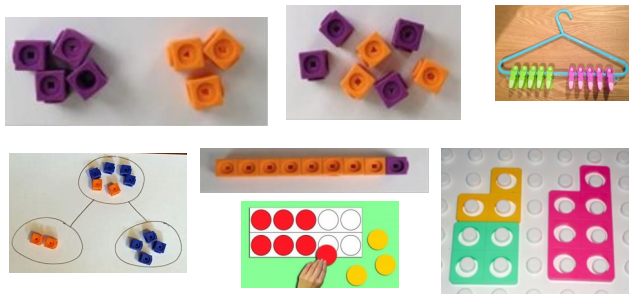**National Curriculum statutory requirements:**

- Represent and use number bonds and related subtraction facts within 20
- Add one-digit and two-digit numbers to 20, including zero
- Read, write and interpret mathematical statements involving addition (+) and equals (=) signs
- Solve one-step problems that involve addition using concrete objects and pictorial representations, and missing number problems such as $7 = ? + 3$

**Non-statutory requirements:**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.
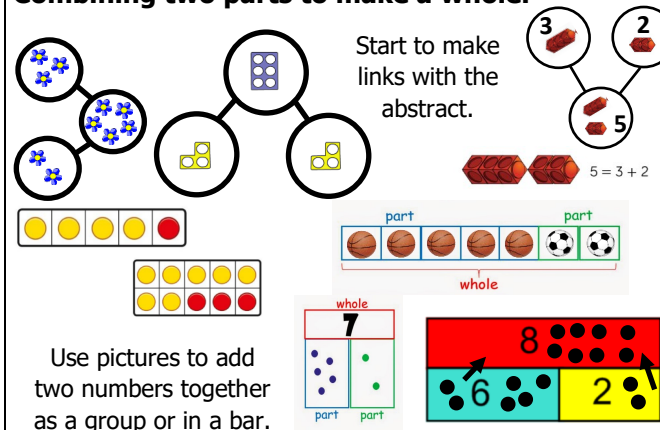
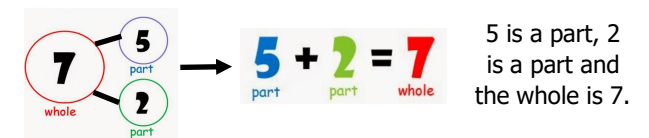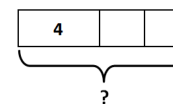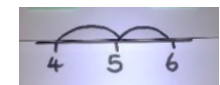| Concrete | Pictorial | Abstract |
|---|---|---|
| **Combining two parts to make a whole.** <br><br>  <br><br> N.B. A range of objects and other manipulatives should also be used here e.g. teddies, stones, counters, sticks. <br> As you progress here, start to make links with the pictorial. | **Combining two parts to make a whole.** <br><br> Start to make links with the abstract. <br><br> $5 = 3 + 2$ <br><br> Use pictures to add two numbers together as a group or in a bar. | **Combining two parts to make a whole.** <br><br> 5 is a part, 2 is a part and the whole is 7. <br><br> Use the part whole diagram to move towards the abstract. <br><br> $3 + 7 = 10$    $9 = 8 + 1$ <br><br> $6 + 4 \bigcirc 3 + 6$     $\bigcirc + \triangle = 4$ |
| **Counting on -** *using cubes, numicon, bead strings etc.* <br><br>  <br><br> Start with the larger number then count on using the smaller number 1 by 1 to find the answer. | **Counting on** - use a numberline which encourages the children to count on, rather than count all. <br><br> Start with the larger number then count on using the smaller number 1 by 1 to find the answer or in one/two jumps. <br><br> $5 + 4 = 9$ <br> $5 + 2 + 2 = 9$ <br> $9 = 5 + 4$ <br><br> $12 + 5 = 17$ <br><br> A bar model can also be used which encourages children to count on. | **Counting on** - the abstract number line: <br> • What is 5 more than 9? <br> • What is the sum of 5 and 5? <br> • What's the total of 12 and 3? <br> • What's the total of 5 and 12? - put larger number first or look at a range of different strategies e.g. $10 + 2$ <br><br> Place the larger number in your head and count on with the smaller number to find your answer. <br><br> Lead on to questions such as this: <br> • $5 + ? = 8$  What do we add to 5 to make 8? |
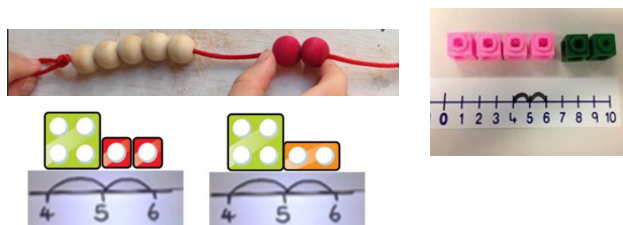
**Key Vocabulary:**

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 1 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**
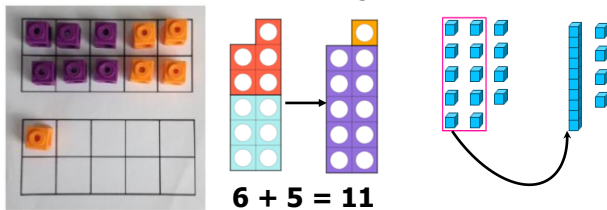
**National Curriculum statutory requirements:**

- Represent and use number bonds and related subtraction facts within 20
- Add one-digit and two-digit numbers to 20, including zero
- Read, write and interpret mathematical statements involving addition (+) and equals (=) signs
- Solve one-step problems that involve addition using concrete objects and pictorial representations, and missing number problems such as 7 = ? + 3

**Non-statutory requirements:**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 − 7 = 9; 7 = 16 − 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

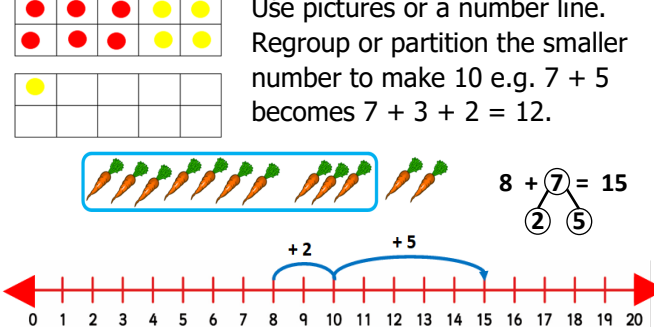| Concrete | Pictorial | Abstract |
|---|---|---|
| **Regrouping to make 10 -** using ten frames, counters/cubes. Base 10 or using Numicon.  **6 + 5 = 11** <br><br> Start with the larger number and use the smaller number to make 10. | **Regrouping to make 10 -** children to draw the ten frame and the counters/cubes.  Use pictures or a number line. Regroup or partition the smaller number to make 10 e.g. 7 + 5 becomes 7 + 3 + 2 = 12.  $8 + 7 = 15$   (2)(5) | **Regrouping to make 10** <br><br> **8 + 6 = 14** <br><br> If I am at eight, how many more do I need to make 10? How many more do I add on now <br><br> **Children to develop an understanding of equality e.g.** <br><br> **6 + ☐ = 11**     **6 + 5 = 5 + ☐** <br><br> **6 + 5 = ☐ + 4** |

**Key Vocabulary:**

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 2  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 2, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

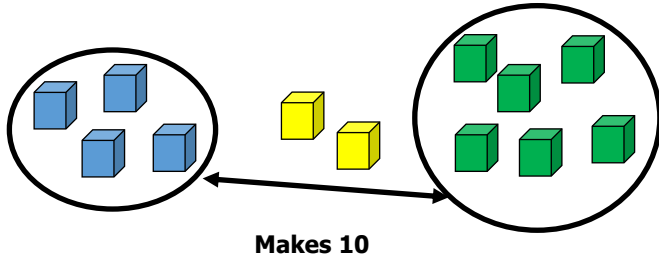**National Curriculum statutory requirements:**

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- Add numbers mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
- Add numbers using concrete objects and pictorial presentations, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
- Show that addition of two numbers can be done in any order
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition using concrete objects and pictorial representations, including those involving numbers, quantities and measures

**Non-statutory requirements:**

- Pupils extend their understanding of the language of addition and subtraction to include sum and difference.
- Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.
- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.
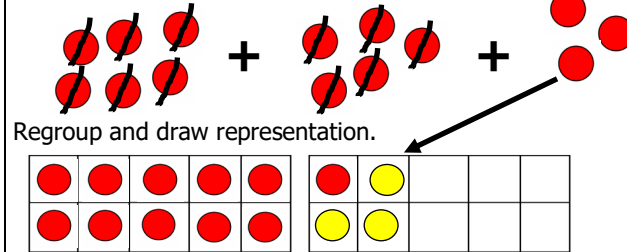
| Concrete | Pictorial | Abstract |
|---|---|---|
| **Adding three single digits** | **Adding three single digits** | **Adding three single digits** |
|  **Makes 10** Combine to make 10 first if possible, or bridge 10 then add third digit.  10 and two more makes 12. |  Regroup and draw representation.  Then add the three more (shown in a different colour here). N.B. Children may not need to draw a tens frame here. | Combine the two numbers that make/bridge ten then add on the third. $$④ + 7 + ⑥ = 10 + 7$$ $$10$$ $$= 17$$ |

**Before this stage ensure that the children are confident at using a range of manipulatives to add numbers before using a place value grid; they should be confident in grouping tens and ones e.g.   $34 + 5 = 39$     (34 is 3 tens and 4 ones. 4 ones and 5 ones are 9 ones. The total is 3 tens and 9 ones.)**

| **23 + 5** **No exchange** | **23 + 5** **No exchange** | **23 + 5** **No exchange** |
|---|---|---|
| **Step 1:** • Make the calculation. **Step 2:** • Combine all the ones. There are 8 ones. **Step 3:** • Move the tens down. There are 2 tens. **Step 4:** • There are 2 tens and 8 ones (28). **$23 + 5 = 8$**  |  | $$\begin{array}{r} 2\ 3 \\ +\ \ \ 5 \\ \hline 2\ 8 \\ \hline \end{array}$$ |

## Key Vocabulary:

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 2 — Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 2, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.
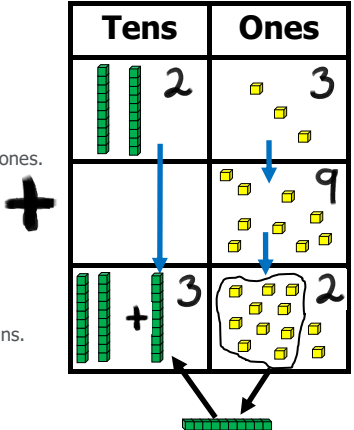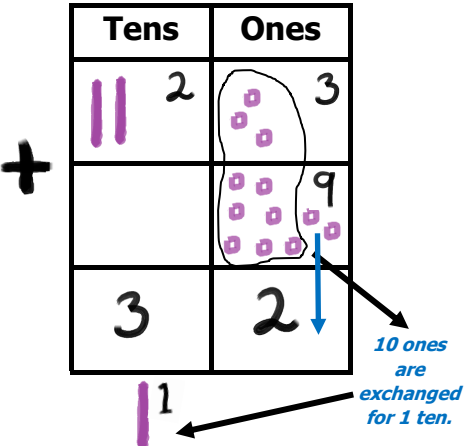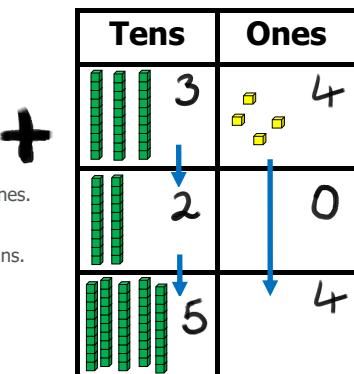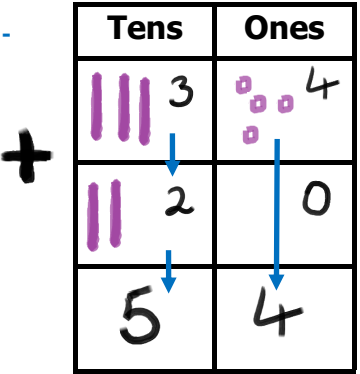Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- Add numbers mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
- Add numbers using concrete objects and pictorial presentations, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
- Show that addition of two numbers can be done in any order
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition using concrete objects and pictorial representations, including those involving numbers, quantities and measures

**Non-statutory requirements:**

- Pupils extend their understanding of the language of addition and subtraction to include sum and difference.
- Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.
- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

| Concrete | Pictorial | Abstract |
|---|---|---|
| **23 + 9** **Exchanging ones** **Step 1:** • Make the calculation. **Step 2:** • Combine all the ones. There are 12 ones. **Step 3:** • Exchange 10 ones for a 10. The 10 must go in the tens column. There are 2 ones left over. **Step 4:** • Combine all the tens. There are 3 tens. **Step 5:** • There are 3 tens and 2 ones (32). **23 + 9 = 32** | **23 + 9** **Exchanging ones** *10 ones are exchanged for 1 ten.* | **23 + 9** **Exchanging ones** |
| **34 + 20** **Adding multiples of 10 only - not bridging a 100** **Step 1:** • Make the calculation. **Step 2:** • Move the ones down. There are 4 ones. **Step 3:** • Combine all the tens. There are 5 tens. **Step 4:** • There are 5 tens and 4 ones (54). **34 + 20 = 54** | **34 + 20** **Adding multiples of 10 only - not bridging a 100** | **34 + 20** **Adding multiples of 10 only - not bridging a 100** |



**Key Vocabulary:**

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 2 — Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 2, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- Add numbers mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
- Add numbers using concrete objects and pictorial presentations, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers
- Show that addition of two numbers can be done in any order
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with addition using concrete objects and pictorial representations, including those involving numbers, quantities and measures

**Non-statutory requirements:**

- Pupils extend their understanding of the language of addition and subtraction to include sum and difference.
- Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.
- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

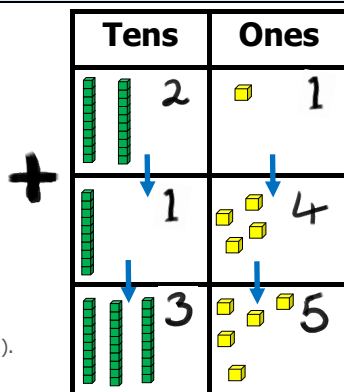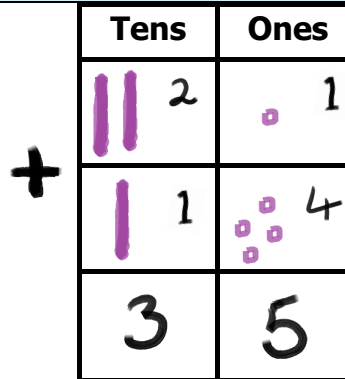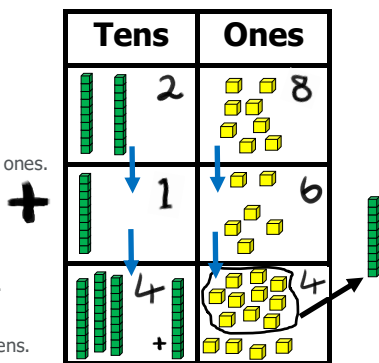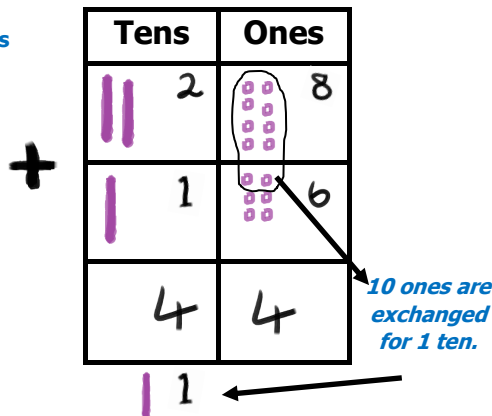| Concrete | Pictorial | Abstract |
|---|---|---|
| **21 + 14** **No exchange** **Step 1:** • Make the calculation. **Step 2:** • Combine all the ones. There are 5 ones. **Step 3:** • Combine all the tens. There are 3 tens. **Step 4:** • There are 3 tens and 5 ones (35). **21 + 14 = 35**  | **21 + 14** **No exchange**  | **21 + 14** **No exchange**  |
| **28 + 16** **Exchanging ones** **Step 1:** • Make the calculation. **Step 2:** • Combine all the ones. There are 14 ones. **Step 3:** • Exchange 10 ones for a 10. **Step 4:** • The 10 must go in the tens column. **Step 5:** • Combine all the tens. There are 4 tens. **Step 6:** • There are 4 tens and 4 ones (44). **28 + 16 = 44**  | **28 + 16** **Exchanging ones**  *10 ones are exchanged for 1 ten.* | **28 + 16** **Exchanging ones**  |

## Key Vocabulary:

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 3  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Add numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Add numbers with up to three digits, using formal written methods of columnar addition
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition.

**Non-statutory requirements:**

- Practise solving varied addition questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar addition with increasingly large numbers up to three digits to become fluent.

| Concrete | Pictorial | Abstract |
|---|---|---|

**321 + 14**
**No exchange**
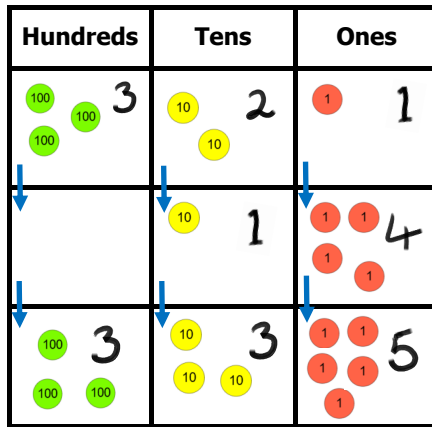
**Step 1:**
- Position the counters on the grid.

**Step 2:**
- Combine the ones.
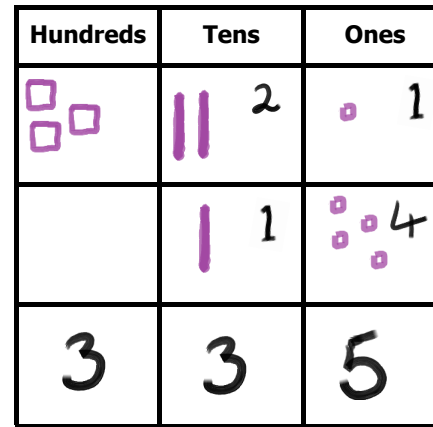  Combine the tens.
  Combine the hundreds.

**Step 3:**
- There are 3 hundreds, 3 tens and 5 ones (335).

**321 + 14 = 335**

**321 + 14**
**No exchange**

**321 + 14**
**No exchange**



**328 + 26**
**Exchanging ones**

**Step 1:**
- Position the counters on the grid.

**Step 2:**
- Combine all the ones.

**Step 3:**
- Exchange 10 ones for a 10. The 10 must go in the tens column. 4 ones are left.

**Step 4:**
- Combine all the tens.

**Step 5:**
- Combine the hundreds.

**Step 6:**
- There are 3 hundreds, 5 tens and 4 ones (354).

**328 + 26 = 354**
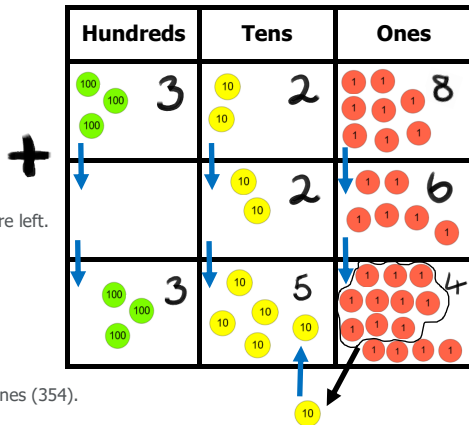
**328 + 26**
**Exchanging ones**
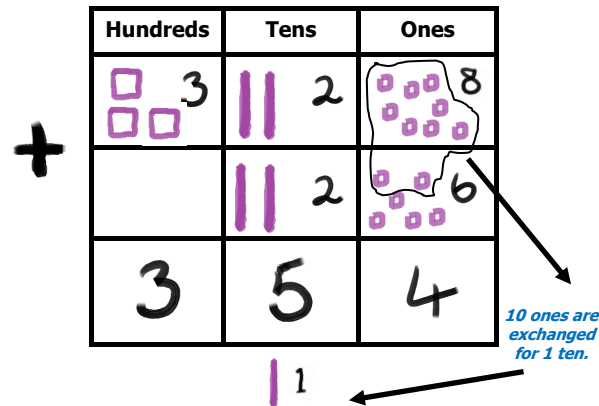
*10 ones are exchanged for 1 ten.*

**328 + 26**
**Exchanging ones**



## Key Vocabulary:

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 3  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

**National Curriculum statutory requirements:**

- Add numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Add numbers with up to three digits, using formal written methods of columnar addition
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition.

**Non-statutory requirements:**

- Practise solving varied addition questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar addition with increasingly large numbers up to three digits to become fluent.

| Concrete | Pictorial | Abstract |
|---|---|---|

**371 + 54**
**Exchanging tens**

**Step 1:**
- Position the counters on the grid.

**Step 2:**
- Combine the ones.

**Step 3:**
- Combine the tens.

**Step 4:**
- Exchange 10 tens for 100. The 100 must go in the hundreds column.

**Step 5:**
- Combine the hundreds.

**Step 6:**
- There are 4 hundreds, 2 tens and 5 ones. **317 + 54 = 425**

**371 + 54**
**Exchanging tens**

*10 tens are exchanged for 1 hundred.*

**371 + 54**
**Exchanging tens**

$$\begin{array}{ccc} 3 & 7 & 1 \\ + & 5 & 4 \\ \hline 4 & 2 & 5 \\ 1 & & \end{array}$$

**368 + 44**
**Exchanging ones and tens**

**Step 1:**
- Position the counters on the grid.

**Step 2:**
- Combine all the ones. Exchange 10 ones for a 10. The 10 must go in the tens column.

**Step 3:**
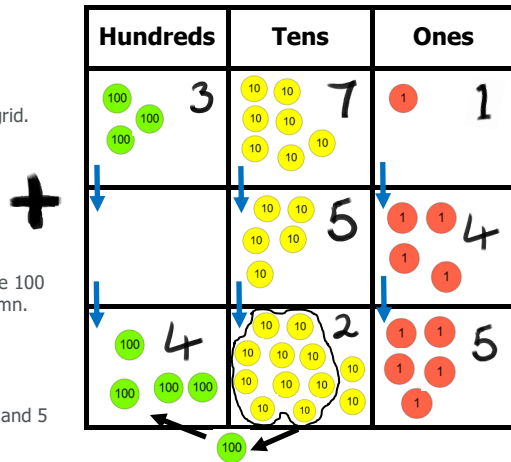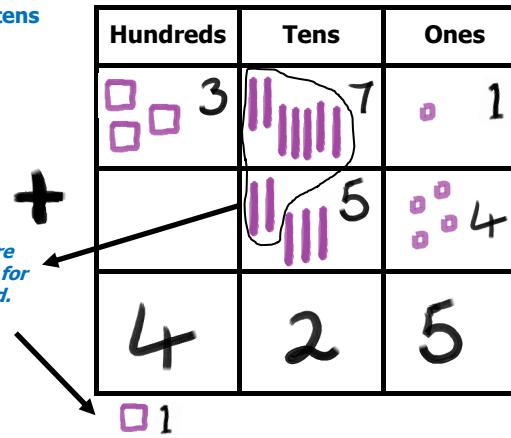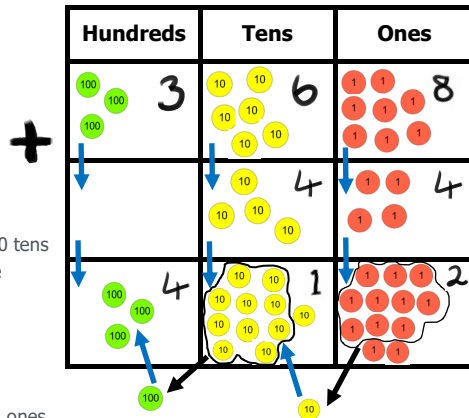- Combine all the tens. Exchange 10 tens for a 100. The 100 must go in the hundreds column.

**Step 5:**
- Combine the hundreds.

**Step 6:**
- There are 4 hundreds, 1 ten and 2 ones.
  **368 + 44 = 412**

**368 + 44**
**Exchanging ones and tens**

*10 tens are exchanged for 1 hundred.*

*10 ones are exchanged for 1 ten.*
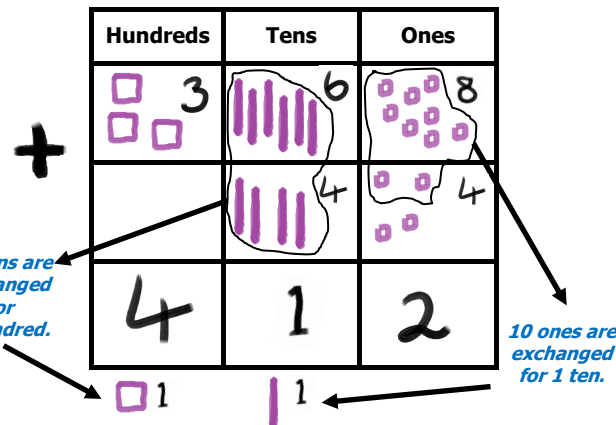
**368 + 44**
**Exchanging ones and tens**

$$\begin{array}{ccc} 3 & 6 & 8 \\ + & 4 & 4 \\ \hline 4 & 1 & 2 \\ 1 & 1 & \end{array}$$

**Key Vocabulary:**

add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange

# Addition - Year 3  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Add numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Add numbers with up to three digits, using formal written methods of columnar addition
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition.

**Non-statutory requirements:**

- Practise solving varied addition questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar addition with increasingly large numbers up to three digits to become fluent.

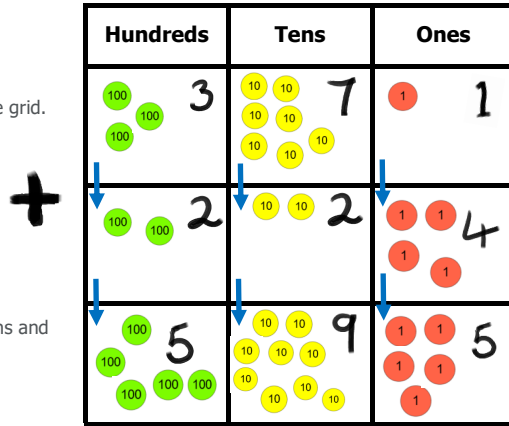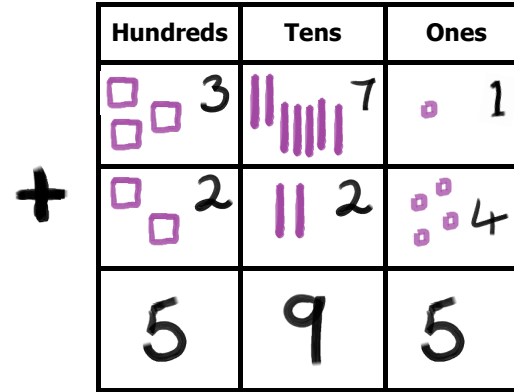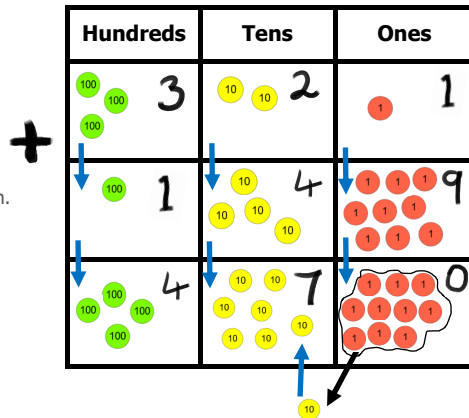| Concrete | Pictorial | Abstract |
|---|---|---|
| **371 + 224** <br> **No exchange** <br><br> **Step 1:** <br> • Position the counters on the grid. <br> **Step 2:** <br> • Combine the ones. <br> **Step 3:** <br> • Combine the tens. <br> **Step 4:** <br> • Combine the hundreds. <br> **Step 5:** <br> • There are 5 hundreds, 9 tens and 5 ones. **371 + 224 = 595** | **371 + 224** <br> **No exchange** | **371 + 224** <br> **No exchange** <br><br> $\begin{array}{r} 371 \\ +\ 224 \\ \hline 595 \\ \hline \end{array}$ |
| **321 + 149** <br> **Exchanging ones** <br><br> **Step 1:** <br> • Position the counters on the grid. <br> **Step 2:** <br> • Combine all the ones. <br> • Exchange 10 ones for a 10. <br> • The 10 must go in the tens column. <br> **Step 3:** <br> • Combine all the tens. <br> **Step 4:** <br> • Combine the hundreds. <br> **Step 5:** <br> • There are 4 hundreds, 7 tens and 0 ones. **321 + 149 = 470** | **321 + 149** <br> **Exchanging ones** <br><br> *10 ones are exchanged for 1 ten.* | **321 + 149** <br> **Exchanging ones** <br><br> $\begin{array}{r} 321 \\ +\ 149 \\ \hline 470 \\ \hline \end{array}$ |
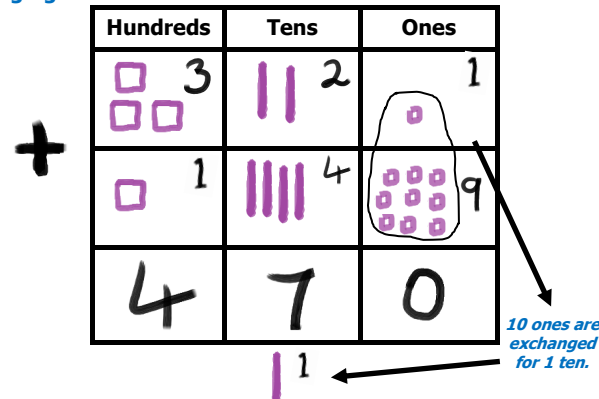
**Key Vocabulary:**

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 3 Calculation Policy

Voyage EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Add numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Add numbers with up to three digits, using formal written methods of columnar addition
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition.

**Non-statutory requirements:**

- Practise solving varied addition questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar addition with increasingly large numbers up to three digits to become fluent.

| Concrete | Pictorial | Abstract |
|---|---|---|

**371 + 278**
**Exchanging tens**

Step 1:
- Position the counters on the grid.

Step 2:
- Combine the ones.

Step 3:
- Combine the tens.

Step 4:
- Exchange 10 tens for 100. The 100 must go in the hundreds column.

Step 5:
- Combine the hundreds.

Step 6:
- There are 6 hundreds, 4 tens and 9 ones. **317 + 278 = 649**

**371 + 278**
**Exchanging tens**

10 tens are exchanged for 1 hundred.

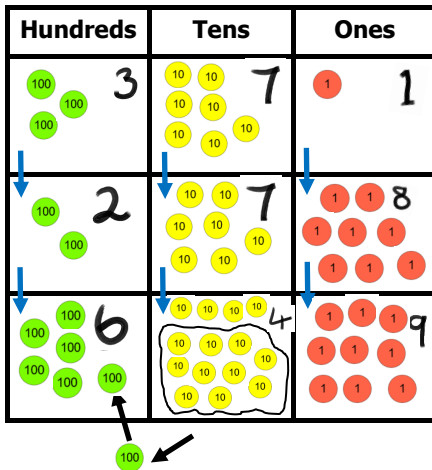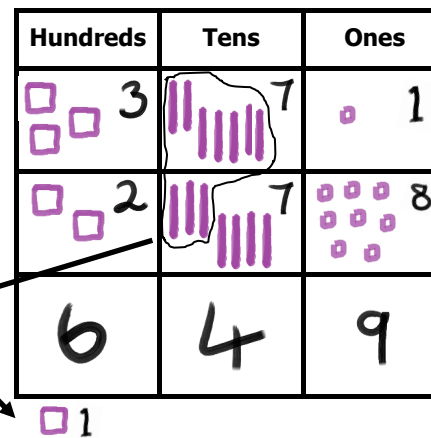**371 + 278**
**Exchanging tens**

$$\begin{array}{r} 3\ 7\ 1 \\ +\ 2\ 7\ 8 \\ \hline 6\ 4\ 9 \\ 1 \end{array}$$

**368 + 345**
**Exchanging ones and tens**

Step 1:
- Position the counters on the grid.

Step 2:
- Combine all the ones. Exchange 10 ones for a 10. The 10 must go in the tens column.

Step 3:
- Combine all the tens. Exchange 10 tens for a 100. The 100 must go in the hundreds column.

Step 4:
- Combine the hundreds.

Step 5:
- There are 7 hundreds, 1 ten and 3 ones.
  **368 + 345 = 713**
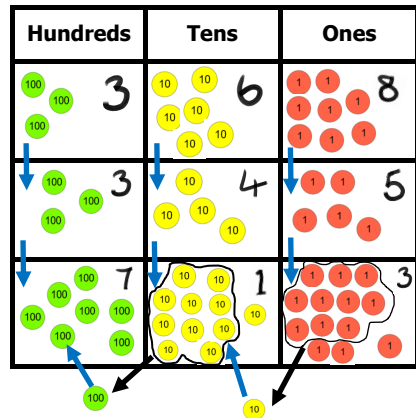
**368 + 345**
**Exchanging ones and tens**

10 tens are exchanged for 1 hundred.
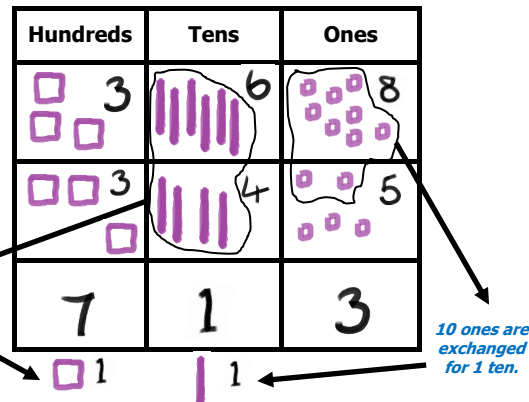
10 ones are exchanged for 1 ten.

**368 + 345**
**Exchanging ones and tens**

$$\begin{array}{r} 3\ 6\ 8 \\ +\ 3\ 4\ 5 \\ \hline 7\ 1\ 3 \\ 1\ \ 1 \end{array}$$

**Key Vocabulary:**

add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make ...?, is the same as, combine, exchange

# Addition - Year 4  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

| Look at the previous learning and recap where appropriate. Throughout Year 4, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.  If they can, then they should. |
|---|

**National Curriculum statutory requirements:**

- Add 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 two-step problems in contexts, deciding which operations and methods to use and why

**Non-statutory requirements:**

- *Pupils continue to practise both mental methods and columnar addition with increasingly large numbers to aid fluency.*
- *Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers.*

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers. This section is split into stages of progression.**

**STAGE 1 - 6234 + 54**
**No exchange**

```
    6  2  3  4
 +        5  4
 ─────────────
    6  2  8  8
```

**STAGE 2 - 6239 + 54**
**Exchanging ones**

```
    6  2  3  9
 +        5  4
 ─────────────
    6  2  9  3
              1
```

**STAGE 3 - 6272 + 54**
**Exchanging tens**

```
    6  2  7  2
 +        5  4
 ─────────────
    6  3  2  6
           1
```

**STAGE 4 - 6278 + 54**
**Exchanging ones and tens**

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

**STAGE 5 - 6415 + 154**
**No exchange**

```
    6  4  1  5
 +     1  5  4
 ─────────────
    6  5  6  9
```

**STAGE 6 - 6416 + 154**
**Exchanging ones**

```
    6  4  1  6
 +     1  5  4
 ─────────────
    6  5  7  0
              1
```

**STAGE 7 - 6245 + 374**
**Exchanging tens**

```
    6  2  4  5
 +     3  7  4
 ─────────────
    6  6  1  9
           1
```

**STAGE 8 - 6225 + 874**
**Exchanging hundreds**

```
    6  2  2  5
 +     8  7  4
 ─────────────
    7  0  9  9
        1
```

**STAGE 9 - 6278 + 374**
**Exchanging ones and tens**

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

**STAGE 10 - 6278 + 814**
**Exchanging ones and hundreds**

```
    6  2  7  8
 +     8  1  4
 ─────────────
    7  0  9  2
        1     1
```

## Key Vocabulary:

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 4 — Calculation Policy

Voyage — EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**Throughout Year 4, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written**

| National Curriculum statutory requirements: | Non-statutory requirements: |
|---|---|
| • Add numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate | • *Pupils continue to practise both mental methods and columnar addition with increasingly large numbers to aid fluency.* |
| • Estimate and use inverse operations to check answers to a calculation | • *Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers.* |
| • Solve addition two-step problems in contexts, deciding which operations and methods to use and why | |

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers.**
**This section is split into stages of progression.**

**STAGE 11 - 6273 + 864**
*Exchanging tens and hundreds*

$$6\ 2\ 7\ 3$$
$$+\ \ \ 8\ 6\ 4$$
$$\overline{7\ 1\ 3\ 7}$$
$$\ \ \ 1\ \ 1$$

**STAGE 12 - 6926 + 484**
*Exchanging ones, tens and hundreds*

$$6\ 9\ 2\ 6$$
$$+\ \ \ 4\ 8\ 4$$
$$\overline{7\ 4\ 1\ 0}$$
$$\ \ 1\ \ 1\ \ 1$$

**STAGE 13 - 6147 + 2352**
*No exchange*

$$6\ 1\ 4\ 7$$
$$+\ 2\ 3\ 5\ 2$$
$$\overline{8\ 4\ 9\ 9}$$

**STAGE 14 - 6147 + 2344**
*Exchanging ones*

$$6\ 1\ 4\ 7$$
$$+\ 2\ 3\ 4\ 4$$
$$\overline{8\ 4\ 9\ 1}$$
$$\ \ \ \ \ \ 1$$

**STAGE 15 - 6147 + 2372**
*Exchanging tens*

$$6\ 1\ 4\ 7$$
$$+\ 2\ 3\ 7\ 2$$
$$\overline{8\ 5\ 1\ 9}$$
$$\ \ \ \ \ 1$$

**STAGE 16 - 6547 + 2942**
*Exchanging hundreds*

$$6\ 5\ 4\ 7$$
$$+\ 2\ 9\ 4\ 2$$
$$\overline{9\ 4\ 8\ 9}$$
$$\ \ \ 1$$

**STAGE 17 - 6547 + 2364**
*Exchanging ones and tens*

$$6\ 5\ 4\ 7$$
$$+\ 2\ 3\ 6\ 4$$
$$\overline{8\ 9\ 1\ 1}$$
$$\ \ \ \ \ 1\ \ 1$$

**STAGE 18 - 6547 + 2724**
*Exchanging ones and hundreds*

$$6\ 5\ 4\ 7$$
$$+\ 2\ 7\ 2\ 4$$
$$\overline{9\ 2\ 7\ 1}$$
$$\ \ 1\ \ \ \ 1$$

**STAGE 19 - 6157 + 2982**
*Exchanging tens and hundreds*

$$6\ 1\ 5\ 7$$
$$+\ 2\ 9\ 8\ 2$$
$$\overline{9\ 1\ 3\ 9}$$
$$\ \ 1\ \ 1$$

**STAGE 20 - 6657 + 2984**
*Exchanging ones, tens and hundreds*

$$6\ 6\ 5\ 7$$
$$+\ 2\ 9\ 8\ 4$$
$$\overline{9\ 6\ 4\ 1}$$
$$\ \ 1\ \ 1\ \ 1$$

## Key Vocabulary:

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 5 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

| Look at the previous learning and recap where appropriate. |
|---|
| **Throughout Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written** |

| **National Curriculum statutory requirements:** | **Non-statutory requirements:** |
|---|---|
| • Add numbers mentally with increasingly large numbers <br> • Add and whole numbers with more than 4 digits, including using formal written methods (columnar addition) <br> • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy <br> • Solve addition multi-step problems in contexts, deciding which operations and methods to use and why | • Pupils practise using the formal written methods of columnar addition with increasingly large numbers to aid fluency. <br> • They practise mental calculations with increasingly large numbers to aid fluency (e.g. 12 462 – 2300 = 10 162). |

| **Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers.** |
|---|
| **This section is split into stages of progression.** |

**Stage 1:  5 digit + 3 digit**
Suggested order of teaching:
- no exchanges
- two exchanges

```
   TTh  Th   H    T    O
 +            H    T    O
 _____
```

**Stage 2:  5 digit + 4 digit**
Suggested order of teaching:
- no exchanges
- one exchange
- three exchanges
- four exchanges

```
   TTh  Th   H    T    O
 +       Th   H    T    O
 _____
```

**Stage 3:  5 digit + 5 digit**
Suggested order of teaching:
- no exchanges
- one exchange
- three exchanges
- four exchanges

```
   TTh  Th   H    T    O
 + TTh  Th   H    T    O
 _____
```

**Stage 4: 6 digit + 3 digit**
Suggested order of teaching:
- no exchanges
- two exchanges

```
  HTh TTh  Th   H    T    O
 +                H    T    O
 _____
```

**Stage 5:  6 digit + 4 digit**
Suggested order of teaching:
- no exchanges
- one exchange
- three exchanges
- four exchanges

```
  HTh TTh  Th   H    T    O
 +            Th   H    T    O
 _____
```

**Stage 6:  6 digit + 5 digit**
Suggested order of teaching:
- no exchanges
- one exchange
- two exchanges
- three exchanges
- four exchanges
- five exchanges

```
  HTh TTh  Th   H    T    O
 +      TTh  Th   H    T    O
 _____
```

**Stage 7:  6 digit + 6 digit**
Suggested order of teaching:
- no exchanges
- one exchange
- two exchanges
- three exchanges
- four exchanges
- five exchanges

```
  HTh TTh  Th   H    T    O
 + HTh TTh  Th   H    T    O
 _____
```

## Key Vocabulary:
*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 5 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**Throughout Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**
- Add numbers mentally with increasingly large numbers
- Add and whole numbers with more than 4 digits, including using formal written methods (columnar addition)
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why

**Non-statutory requirements:**
- Pupils practise using the formal written methods of columnar addition with increasingly large numbers to aid fluency.
- They practise mental calculations with increasingly large numbers to aid fluency (e.g. $12\,462 - 2300 = 10\,162$).

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers.**
**This section is split into stages of progression.**

**STAGE 1 - 2.3 + 4.4**
**No exchange**

```
    2 . 3
 +  4 . 4
 _____
    6 . 7
```

**STAGE 2 - 2.3 + 1.8**
**Exchanging tenths**

```
    2 . 3
 +  1 . 8
 _____
    4 . 1
      1
```

**STAGE 3 - 2.34 + 4.45**
**No exchange**

```
    2 . 3 4
 +  4 . 4 5
 _____
    6 . 7 9
```

**STAGE 4 - 2.34 + 4.47**
**Exchanging hundredths**

```
    2 . 3 4
 +  4 . 4 7
 _____
    6 . 8 1
        1
```

**STAGE 5 - 2.34 + 4.9**
**Exchanging tenths**

```
    2 . 3 4
 +  4 . 9 0
 _____
    7 . 2 4
      1
```
*Place holder needed here.*
*Make sure this is addressed through teaching.*

**STAGE 6 - 2.34 + 0.99**
**Exchanging tenths and hundredths**

```
    2 . 3 4
 +  0 . 9 9
 _____
    3 . 3 3
      1   1
```

**STAGE 7 - 62.3 + 24.4**
**No exchange**

```
    6 2 . 3
 +  2 4 . 4
 _____
    8 6 . 7
```

**STAGE 8 - 62.9 + 20.7**
**Exchanging tenths**

```
    6 2 . 9
 +  2 0 . 7
 _____
    8 3 . 6
        1
```

**STAGE 9 - 69.2 + 29**
**Exchanging ones**

```
    6 9 . 2
 +  2 9 . 0
 _____
    9 8 . 2
    1
```
*Place holder needed here.*
*Make sure this is addressed through teaching.*

**STAGE 10 - 69.2 + 20.9**
**Exchanging tenths and ones**

```
    6 9 . 2
 +  2 0 . 9
 _____
    9 0 . 1
    1   1
```

**Key Vocabulary:**

*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

**Look at the previous learning and recap where appropriate.**
**Throughout Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written**

**National Curriculum statutory requirements:**
- Add numbers mentally with increasingly large numbers
- Add and whole numbers with more than 4 digits, including using formal written methods (columnar addition)
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why

**Non-statutory requirements:**
- Pupils practise using the formal written methods of columnar addition with increasingly large numbers to aid fluency.
- They practise mental calculations with increasingly large numbers to aid fluency (e.g. 12 462 – 2300 = 10 162).

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers.**
**This section is split into stages of progression.**

**STAGE 11 - 62.34 + 24**
**No exchange**

```
   6 2 . 3 4
 + 2 4 . 0 0
 _____
   8 6 . 3 4
```

*Place holder needed here.*
*Make sure this is addressed through teaching.*

**STAGE 12 - 62.34 + 10.48**
**Exchanging hundredths**

```
   6 2 . 3 4
 + 1 0 . 4 8
 _____
   7 2 . 8 2
         1
```

**STAGE 13 - 62.34 + 24.07**
**Exchanging tenths**

```
   6 2 . 3 4
 + 2 4 . 0 7
 _____
   8 6 . 4 1
         1
```

**STAGE 14 - 62.94 + 24.08**
**Exchanging hundredths and tenths**

```
   6 2 . 9 4
 + 2 4 . 0 8
 _____
   8 7 . 0 2
       1 1
```

**STAGE 15 - 62.91 + 27.09**
**Exchanging hundredths, tenths and ones**

```
   6 2 . 9 1
 + 2 7 . 0 9
 _____
   9 0 . 0 0
     1 1 1
```

**STAGE 16 including:**
- no exchanges
- two exchanges

```
   H  T  O . t
 + H  T  O . t
 _____
   H  T  O . t
```

**STAGE 17 including:**
- no exchanges
- one exchange
- two exchanges
- three exchanges
- four exchanges

```
   H  T  O . t  h
 + H  T  O . t  h
 _____
   H  T  O . t  h
```

**STAGE 18 including:**
- no exchanges
- one exchange
- two exchanges
- three exchanges
- four exchanges

```
   Th H  T  O . t
 + Th H  T  O . t
 _____
   Th H  T  O . t
```

**STAGE 19 including:**
- no exchanges
- one exchange
- two exchanges
- three exchanges
- four exchanges
- five exchanges

```
   Th H  T  O . t  h
 + Th H  T  O . t  h
 _____
   Th H  T  O . t  h
```

**STAGE 20 including:**
- no exchanges
- one exchange
- two exchanges
- three exchanges
- four exchanges
- five exchanges

```
   TTh Th H  T  O . t
 + TTh Th H  T  O . t
 _____
   TTh Th H  T  O . t
```

**Key Vocabulary:**
*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Addition - Year 6  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate thus developing the Year 5 experiences.**
**Throughout Year 6, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**
- Perform mental calculations, including with mixed operations and large numbers
- Solve problems involving addition, including multi-step problems in contexts, deciding which operations and methods to use and why
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why

**Non-statutory requirements:**
- Pupils practise addition for larger numbers, using the formal written methods.
- They undertake mental calculations with increasingly large numbers and more complex calculations.
- Pupils round answers to a specified degree of accuracy, e.g. to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.
- Pupils explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$.

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

---

**STAGE 1: whole numbers with the same number of places**
No exchange, one exchange, multiple exchanges
*E.g. maximum expectation shown below (though can go into 10 million)*

|   | M | HTh | TTh | Th | H | T | O |
|---|---|-----|-----|----|---|---|---|
|   | M | HTh | TTh | Th | H | T | O |
| + | M | HTh | TTh | Th | H | T | O |
|   | M | HTh | TTh | Th | H | T | O |

**STAGE 2: whole numbers with a different number of places**
No exchange, one exchange, multiple exchanges
*E.g. maximum expectation shown below though second number can be any number up to and into the HTh*

|   | M | HTh | TTh | Th | H | T | O |
|---|---|-----|-----|----|---|---|---|
|   | M | HTh | TTh | Th | H | T | O |
| + |   |     | TTh | Th | H | T | O |
|   | M | HTh | TTh | Th | H | T | O |

**STAGE 3: decimal numbers with the same number of places**
No exchange, one exchange, multiple exchanges
*E.g. maximum expectation shown below (though can go into 10 million) and only up to thousandths)*

|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |
|---|---|-----|-----|----|---|---|---|---|---|---|----|
|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |
| + | M | HTh | TTh | Th | H | T | O | . | t | h | th |
|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |

---

**STAGE 4: decimal numbers with a different number of places**
No exchange, one exchange, multiple exchanges
**E.g 1**

|   | TTh | Th | H | T | O | . | t |   |
|---|-----|----|---|---|---|---|---|---|
|   |     |    |   |   |   |   |   |   |
| + |     |    | H | T | O | . | t | h |
|   | TTh | Th | H | T | O | . | t |   |

**N.B. you can go up to a million and up to thousandths**

**STAGE 4: decimal numbers with a different number of places**
No exchange, one exchange, multiple exchanges
**E.g 2**

| HTh | TTh | Th | H | T | O | . | t | h |    |
|-----|-----|----|---|---|---|---|---|---|----|
|     |     | Th | H | T | O | . | t | h | th |
| +   |     |    |   |   |   |   |   |   |    |
| TTh | Th  | H  | T | O | . | t | h | th |    |

**N.B. you can go up to a million and up to thousandths**

**STAGE 4: decimal numbers with a different number of places**
No exchange, one exchange, multiple exchanges
**E.g 3**

|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |
|---|---|-----|-----|----|---|---|---|---|---|---|----|
|   |   | HTh | TTh | Th | H | T | O | . | t |   |    |
| + |   |     | TTh | Th | H | T | O | . | t | h | th |
|   |   |     |     |    |   |   |   |   |   |   |    |

**N.B. you can go up to a million and up to thousandths**

---

**Key Vocabulary:**
*add, addition, more, plus, increase, sum, total, altogether, difference, same as, equals, sign, units/ones, inverse, how many more to make …?, is the same as, combine, exchange*

# Subtraction - Year 1 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

**National Curriculum statutory requirements:**

- Represent and use number bonds and related subtraction facts within 20
- Subtract one-digit and two-digit numbers to 20, including zero
- Read, write and interpret mathematical statements involving subtraction (−) and equals (=) signs
- Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$
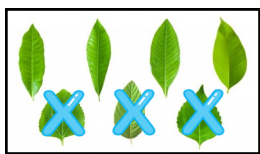
**Non-statutory requirements:**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.
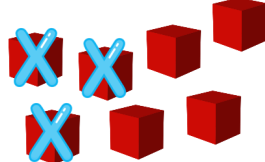
| Concrete | Pictorial | Abstract |
|---|---|---|
| **Taking away by removing objects (within 10)** <br><br> N.B. Children to physically remove the objects not cross out. <br><br>  <br><br> $7 - 3 = 4$    $7 - 3 = 4$ <br><br> *3 less than 7 is 4*    *7 subtract 3 is 4* <br><br> A range of objects and other manipulatives should also be used here e.g. teddies, stones, counters, sticks. <br><br> As you progress here, start to make links with the pictorial. | **Taking away by removing objects (within 10)** <br><br> Children to draw and cross out representations to show taking away. <br><br>  <br><br> $8 - 3 = 5$    *3 less than 8 is 5*    *8 subtract 3 is 5* <br><br> Begin to use a bar model to show these representations also. <br><br>  | **Taking away by removing objects (within 10)** <br><br> | 6 | | | |---| | 2 | ? | <br> $6 - 2 = ?$ <br><br>  <br><br> $9 - 4 = ?$ <br><br> $? = 8 - 7$ |
| **Counting back (within 10)** - *using cubes, numicon, bead strings etc.* <br><br>  <br><br> Move objects away from the group, counting backwards. <br><br> Move the beads along the bead string as you count backwards. | **Counting back (within 10)** - *do this pictorially and through the use a numberline. Counting back in ones.* <br><br>  <br> 0 1 2 3 4 5 6 7 8 9 10    $8 - 3 = 5$ <br><br>  <br> 1 2 3 4 5 6 7 8    $8 - 3 = 5$ | **Counting back (within 10)** <br><br> Put 9 in your head and count back 4. <br><br> What number are you at? <br><br> $9 - 4 = ?$ |
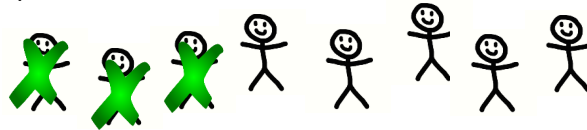
**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 1 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

**National Curriculum statutory requirements:**

- Represent and use number bonds and related subtraction facts within 20

- Subtract one-digit and two-digit numbers to 20, including zero

- Read, write and interpret mathematical statements involving subtraction (–) and equals (=) signs

- Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$

**Non-statutory requirements:**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.
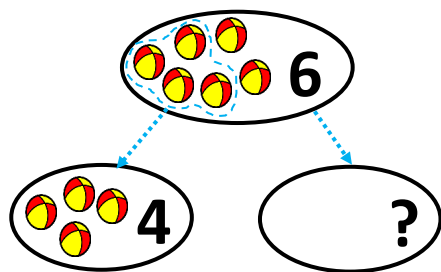
- Pupils combine and increase numbers, counting forwards and backwards.

- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

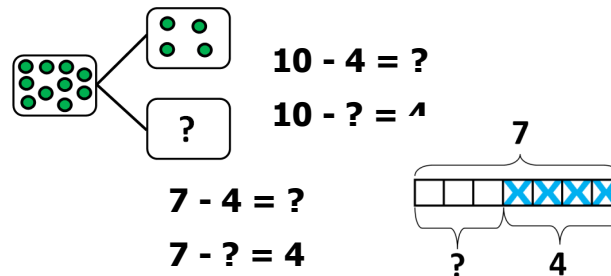| Concrete | Pictorial | Abstract |
|---|---|---|
| **Find a missing part (within 10)** <br><br> Children separate a whole into parts and understand how one part can be found by subtraction. *(Links to addition.)* <br><br> If **6** is the whole and **4** is one of the parts, what is the other part? <br><br> $6 - 4 = ?$ <br> $6 - ? = 4$ | **Finding a missing part (within 10)** <br><br> Use pictorial representations to show the part. <br><br> Children represent a whole and a part and understand how to find the missing part by subtraction. <br><br> $10 - 4 = ?$ <br> $10 - ? = 4$ <br><br> $7 - 4 = ?$ <br> $7 - ? = 4$ | **Finding a missing part (within 10)** <br><br> Children use a part-whole model to support the subtraction to find a missing part. <br><br> $9 - 3 = ?$ <br> $9 - ? = 3$ <br><br> Make links to addition. <br><br> $\square - \square = \square$ <br> $\square - \square = \square$ <br> $\square + \square = \square$ <br> $\square + \square = \square$ |
| **Finding the difference** <br><br> Arrange the two groups so that the difference between them can be worked out (like a bar model). <br><br> 7 is 4 more than 3. <br> 3 is 4 less than 7. <br> The difference between 7 and 3 is 4. | **Finding the difference** <br><br> Represent objects using sketches or counters to support finding the difference. <br><br> $5 - 3 = 2$ <br> The difference between 5 and 3 is 2. <br> 5 is 2 more than 3 and 3 is 2 less than 5. <br><br> $8 - 5 = 3$ <br> The difference between 8 and 3 is 5. <br> 8 is 5 more than 3 and 3 is 5 less than 5. | **Finding the difference** <br><br> Children understand 'find the difference' as subtraction. <br><br> The difference between 10 and 4 is 6. <br><br> $10 - 6 = 4$ <br><br> 10 is 6 more than 4 and 4 is 6 less than 10. |
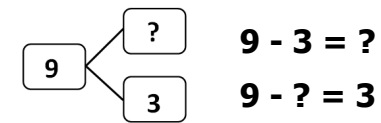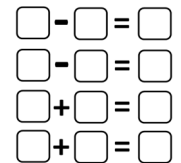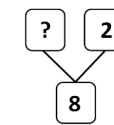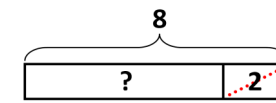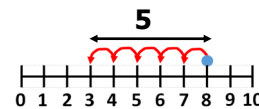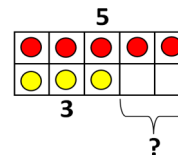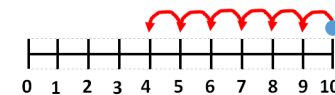
**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 1 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

**National Curriculum statutory requirements:**

- Represent and use number bonds and related subtraction facts within 20

- Subtract one-digit and two-digit numbers to 20, including zero

- Read, write and interpret mathematical statements involving subtraction (−) and equals (=) signs

- Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$

**Non-statutory requirements:**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.

- Pupils combine and increase numbers, counting forwards and backwards.

- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

| Concrete | Pictorial | Abstract |
|---|---|---|
| **Subtraction of one-digit number within 20 (not bridging 10).** Use a bead string, for example, to subtract 1s efficiently.  Make links to known number facts e.g. **5 - 2 = 3** **15 - 2 = 13** | **Subtraction of one-digit number within 20 (not bridging 10).**  Make links to known number facts e.g. **6 - 4 = 2** **16 - 4 = 12** | **Subtraction of one-digit number within 20 (not bridging 10).** Calculate subtractions using known number facts with confidence e.g. *I know 8 - 7 = 1 so I can use this number fact to help me to answer 18 - 7 = ?* *I know 10 - 6 = 4 so I can use this number fact to help me to answer 20 - 6 = ?* Use prior learning on subtraction to find the difference to find missing parts with in 20 but not bridging 10. |
| **Subtraction within 20 (10s and 1s)** Use objects to subtract the ten and then the remaining ones e.g. 17 - 11 (consider the arrangement of the objects).  **Subtract the 10**    **Subtract the 1** **17 - 11**   **17 - 10 = 7**   **7 - 1 = 6**   **17 - 11 = 6** | **Subtraction within 20 (10s and 1s)** Draw/use ten frames to represent the efficient method of subtracting 10s and 1s.  **Subtract the 10**        **Subtract the 1s** **19 - 14**   **19 - 10 = 9**   **9 - 4 = 5**   **19 - 14 = 5** | **Subtraction within 20 (10s and 1s)** Use a part whole model to support the calculation.  20 - 13 20 - 10 = 10 10 - 3 = 7 20 - 13 = 7 |
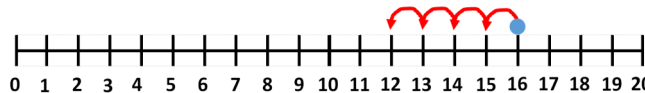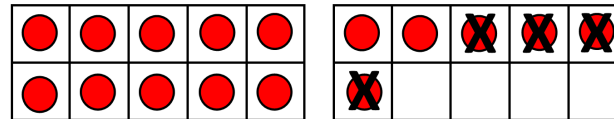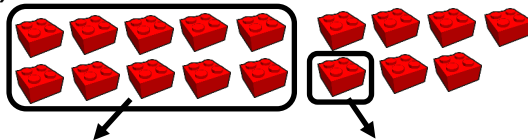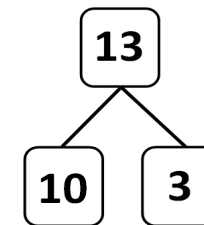
**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 1 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

**National Curriculum statutory requirements:**

- Represent and use number bonds and related subtraction facts within 20
- Subtract one-digit and two-digit numbers to 20, including zero
- Read, write and interpret mathematical statements involving subtraction (−) and equals (=) signs
- Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? − 9$

**Non-statutory requirements:**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 − 7 = 9; 7 = 16 − 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

| Concrete | Pictorial | Abstract |
|---|---|---|
| **Subtraction bridging 10 (using number bonds).** Arrange objects into a 10 and some 1s, then split the subtracting number into parts using knowledge of number bonds e.g. **14 - 7** <br> **7 is 4 and 3** <br> I can take away the 4 and then the 3. <br> **14 - 7 = 7** | **Subtraction bridging 10 (using number bonds).** Represent the calculation using tens frames and number lines e.g. **16 - 9** <br><br> With 9, I can take away the 6 and then the 3. <br> Subtract 3    Subtract 6 <br> 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 <br><br> **16 - 9 = 7** | **Subtraction bridging 10 (using number bonds).** Use a part-whole model to support the method e.g. 15 - 8 <br><br> 8 <br> 15 |
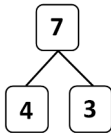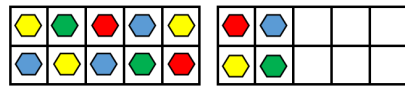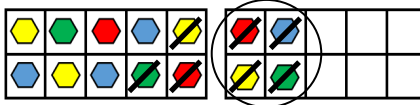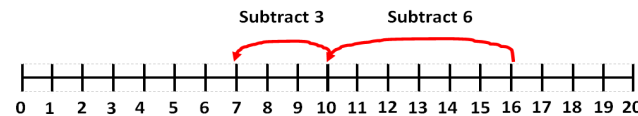
**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 2 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 2, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

- Subtract numbers mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers

- Subtract numbers using concrete objects and pictorial presentations, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers

- Show that subtraction of two numbers cannot be done in any order

- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

- Solve problems with subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures

**Non-statutory requirements:**

- Pupils extend their understanding of the language of addition and subtraction to include sum and difference.

- Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.

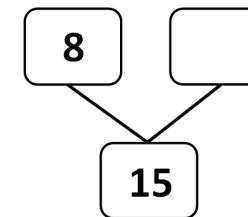- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

| Concrete | Pictorial | Abstract |
|---|---|---|
| Before this stage ensure that the children are confident at using a range of manipulatives to subtract numbers before using a place value grid; they should be confident in grouping tens and ones e.g. 27 - 5 = 22 (27 is 2 tens and 7 ones. 7 ones subtract 2 ones are 5 ones. The total is 2 tens and 5 ones.) | | |

**38 - 5** No exchange

**Step 1:**
- Position the Base 10 on the grid (top row).

**Step 2:**
- **Ones** column (8 ones subtract 5 ones). Move down 5 ones from the top to the middle row and then subtract them away. Move the remaining 3 ones down from the top to the bottom row.

**Step 3:**
- **Tens** column (3 tens subtract 0 tens). Move down 3 tens from the top row to the bottom row.

**Step 4:**
- There are 3 tens and 3 ones (33). **38 - 5 = 33**



**38 - 5** No exchange



**38 - 5** No exchange

$$\begin{array}{cc} 3 & 8 \\ - & 5 \\ \hline 3 & 3 \end{array}$$

**52 - 6** Exchanging 10s

**Step 1:**
- Position the base 10 on the grid (top row).

**Step 2:**
- **Ones** column (2 ones subtract 6 ones) - there needs to be an exchange here. Go to the tens column and exchange 1 ten for 10 ones. Add the 10 ones to the ones (top row) - you now have 12 ones. You have 4 tens left in the tens column - cross out the 5 and change to a 4 to show this.

**Step 3:**
- **Ones** column - now move down 6 counters from the top to the middle row and then subtract them away. Move the remaining 6 counters down from the top to the bottom row.

**Step 4:**
- **Tens** column (4 tens subtract 0 tens) - move down 4 tens from the top row to the bottom row.

**Step 5:**
- There are 4 tens and 6 ones (46). **52 - 6 = 46**
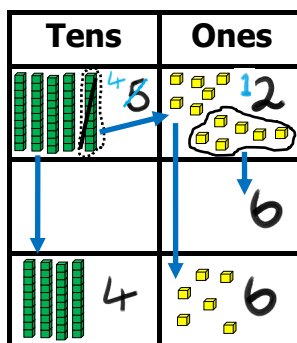


**52 - 6** Exchanging 10s
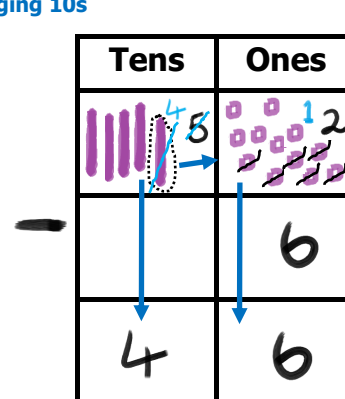


**52 - 6** Exchanging 10s

$$\begin{array}{cc} {}^{4}\!\!\!\not{5} & {}^{1}2 \\ - & 6 \\ \hline 4 & 6 \end{array}$$

**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 2 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 2, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.

**National Curriculum statutory requirements:**

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- Subtract numbers mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers
- Subtract numbers using concrete objects and pictorial presentations, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers
- Show that subtraction of two numbers cannot be done in any order
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
- Solve problems with subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures

**Non-statutory requirements:**

- Pupils extend their understanding of the language of addition and subtraction to include sum and difference.
- Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.
- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

| Concrete | Pictorial | Abstract |
|---|---|---|

Before this stage ensure that the children are confident at using a range of manipulatives to subtract numbers before using a place value grid; they should be confident in grouping tens and ones e.g.  27 - 5 = 22    (27 is 2 tens and 7 ones. 7 ones subtract 2 ones are 5 ones. The total is 2 tens and 5 ones.)

## 59 - 27  No exchange

**Concrete**

Step 1:
- Position the counters on the grid (top row).
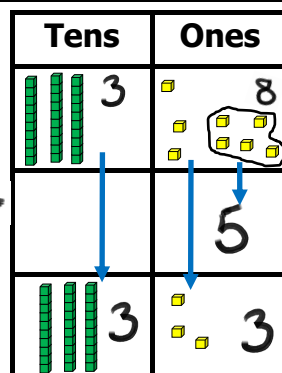
Step 2:
- **Ones** column (9 ones subtract 7 ones) - move down 7 ones from the top to the middle row and then subtract them away. Move the remaining 2 ones down from the top to the bottom row.
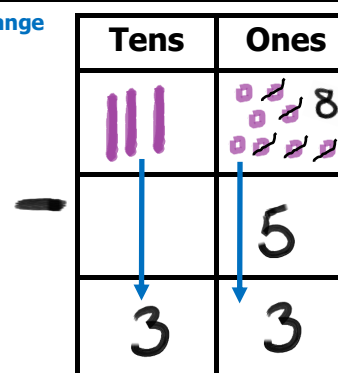
Step 3:
- **Tens** column (5 tens subtract 2 tens) - move down 2 tens from the top row to the middle row and then subtract them away. Move the remaining 3 tens down from the top to the bottom row.

Step 4:
- There are 3 tens and 2 ones (32). **59 - 27 = 32**



**59 - 27  No exchange** (Pictorial)



**59 - 27  No exchange** (Abstract)



## 73 - 29  Exchanging 10s

**Concrete**

Step 1:
- Position the counters on the grid (top row).

Step 2:
- **Ones** column (3 ones subtract 9 ones) - there needs to be an exchange here. Go to the tens column and exchange 1 ten for 10 ones. Add the 10 ones to the ones (top row) - you now have 13 ones. You have 6 tens left in the tens column - cross out the 7 and change to a 6 to show this.

Step 3:
- **Ones** column - now move down 9 counters from the top to the middle row and then subtract them away. Move the remaining 4 counters down from the top to the bottom row.

Step 4:
- **Tens** column (6 tens subtract 2 tens) - move down 2 tens from the top row to the middle row and then subtract them away. Move the remaining 4 tens down from the top to the bottom row.

Step 5:
- There are 4 tens and 4 ones (44). **73 - 29 = 44**



**73 - 29  Exchanging 10s** (Pictorial)



**73 - 29  Exchanging 10s** (Abstract)



**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 3 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

• Subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
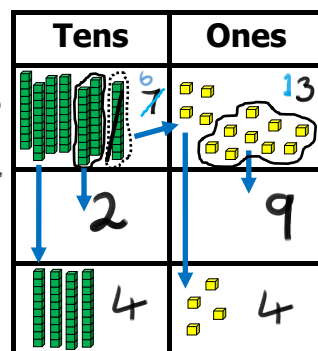
• Subtract numbers with up to three digits, using formal written methods of columnar subtraction

• Estimate the answer to a calculation and use inverse operations to check answers

• Solve problems, including missing number problems, using number facts, place value, and more complex subtraction.

**Non-statutory requirements:**

• Practise solving varied subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.

• Use understanding of place value and partitioning, and practise using columnar subtraction with increasingly large numbers up to three digits to become fluent.

| Concrete | Pictorial | Abstract |
|---|---|---|

### 346 - 24 No exchange

**Step 1:**
• Position the counters on the grid (top row).
**Step 2:**
• **Ones** column (6 ones subtract 4 ones) - move down 4 ones from the top to the middle row and then subtract them away. Move the remaining 2 ones down from the top to the bottom row.
**Step 3:**
• **Tens** column (4 tens subtract 2 tens) - move down 2 tens from the top row to the middle row and then subtract them away. Move the remaining 2 tens down from the top to the bottom row.
**Step 4:**
• **Hundreds** column (3 hundreds subtract 0 hundreds) - move the 3 hundreds down into the bottom row.
**Step 5:**
• There are 3 hundreds, 2 tens and 2 ones (322). **346 - 24 = 322**

### 346 - 24 No exchange

### 346 - 24 No exchange

$$
\begin{array}{r}
3\ 4\ 6 \\
-\ \ \ 2\ 4 \\
\hline
3\ 2\ 2
\end{array}
$$

### 342 - 25 Exchanging tens

**Step 1:**
• Position the counters on the grid (top row).
**Step 2:**
• **Ones** column (2 ones subtract 5 ones) - there needs to be an exchange here. Go to the tens column and exchange 1 ten for 10 ones. Add the 10 ones to the ones (top row) - you now have 12 ones. You have 3 tens left in the tens column - cross out the 4 and change to a 3 to show this.
**Step 3:**
• **Ones** column - now move down 5 counters from the top to the middle row and then subtract them away. Move the remaining 7 counters down from the top to the bottom row.
**Step 4:**
• **Tens** column (3 tens subtract 2 tens) - move down 2 tens from the top row to the middle row and then subtract them away. Move the remaining 1 ten down from the top to the bottom row.
**Step 5:**
• **Hundreds** column (3 hundreds subtract 0 hundreds) - move the 3 hundreds down into the bottom row.
**Step 6:**
• There are 3 hundreds, 1 ten and 7 ones (317). **342 - 25 = 317**
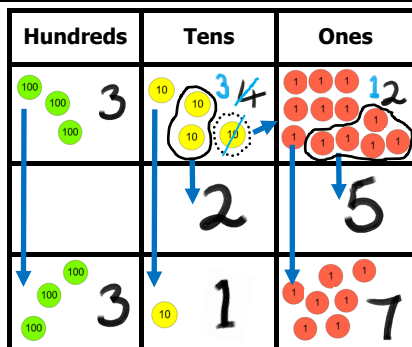
### 342 - 25 Exchanging tens
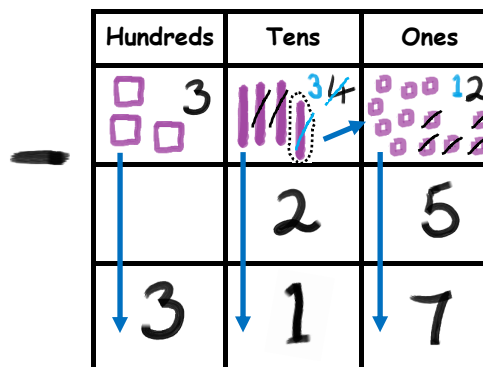
### 342 - 25 Exchanging tens

$$
\begin{array}{r}
3\ \ {}^{3}\!\!\!\not{4}\ \ {}^{1}2 \\
-\ \ \ \ 2\ 5 \\
\hline
3\ \ 1\ \ 7
\end{array}
$$

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 3 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Subtract numbers with up to three digits, using formal written methods of columnar subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex subtraction.

**Non-statutory requirements:**

- Practise solving varied subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar subtraction with increasingly large numbers up to three digits to become fluent.

| Concrete | Pictorial | Abstract |
|---|---|---|

## 346 - 74 Exchanging hundreds
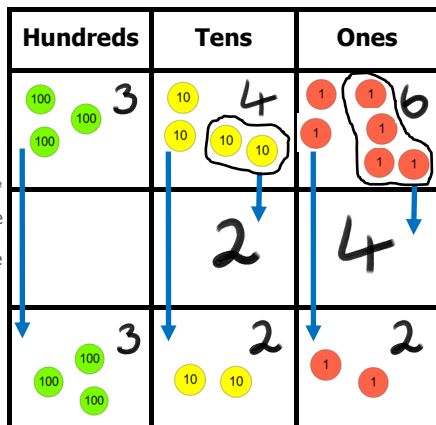
**346 - 74 Exchanging hundreds**

**Step 1:**
- Position the counters on the grid (top row).

**Step 2:**
- Ones column (6 ones subtract 4 ones) - move down 4 ones from the top to the middle row and then subtract them away. Move the remaining 2 ones down from the top to the bottom row.

**Step 3:**
- Tens column (4 tens subtract 7 tens) - there needs to be an exchange here. Go to the hundreds column and exchange 1 hundred for 10 tens. Add the 10 tens to the tens column (top row) - you now have 14 tens. You have 2 hundreds left in the hundreds column - cross out the 3 and change to a 2 to show this.

**Step 4:**
- Tens column - move down 7 tens from the top row to the middle row and then subtract them away. Move the remaining 7 tens down from the top to the bottom row.
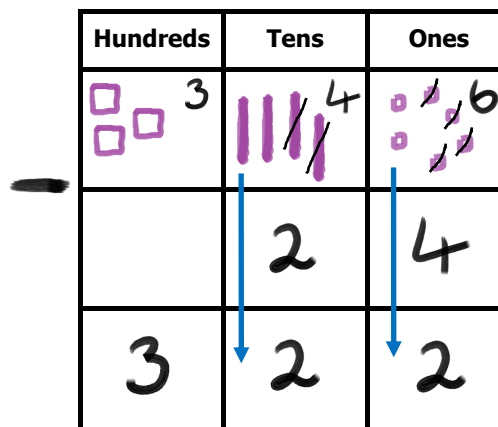
**Step 5:**
- Hundreds column (2 hundreds subtract 0 hundreds) - move the 2 hundreds down into the bottom row.

**Step 6:**
- There are 2 hundreds, 7 tens and 2 ones (272). **346 - 74 = 272**



## 321 + 46 Exchanging tens and hundreds

**321 + 46 Exchanging tens and hundreds**

**Step 1:**
- Position the counters on the grid (top row).

**Step 2:**
- Ones column (1 one subtract 6 ones) - there needs to be an exchange here. Go to the tens column and exchange 1 ten for 10 ones. Add the 10 ones to the ones (top row) - you now have 11 ones. You have 2 tens left in the tens column - cross out the 2 and change to a 1 to show this.

**Step 3:**
- Ones column - now move down 6 counters from the top to the middle row and then subtract them away. Move the remaining 5 counters down from the top to the bottom row.

**Step 4:**
- Tens column (1 tens subtract 4 tens) - there needs to be an exchange here. Go to the hundreds column and exchange 1 hundred for 10 tens. Add the 10 tens to the tens (top row) - you now have 11 tens; show this by adding a 1 to the existing 1 to make 11. You now have 2 hundreds left in the tens column - cross out the 3 and change to a 2 to show this.

**Step 5:**
- Tens column (11 tens subtract 4 tens) - move down 4 tens from the top row to the middle row and then subtract them away. Move the remaining 7 tens down from the top to the bottom row.

**Step 6:**
- Hundreds column (2 hundreds subtract 0 hundreds) - move the 2 hundreds down into the bottom row.

**Step 7:** There are 2 hundreds, 7 tens and 5 ones (275). **321 + 46 = 275**



**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 3 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Subtract numbers with up to three digits, using formal written methods of columnar subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex subtraction.

**Non-statutory requirements:**

- Practise solving varied subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar subtraction with increasingly large numbers up to three digits to become fluent.

| Concrete | Pictorial | Abstract |
|---|---|---|

### 876 - 354 No exchange

**Step 1:**
- Position the counters on the grid (top row).

**Step 2:**
- **Ones** column (6 ones subtract 4 ones) - move down 4 ones from the top to the middle row and then subtract them away. Move the remaining 2 ones down from the top to the bottom row.
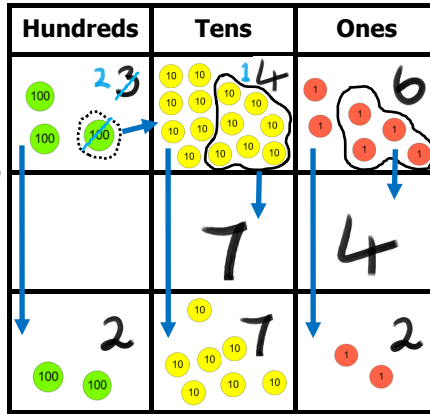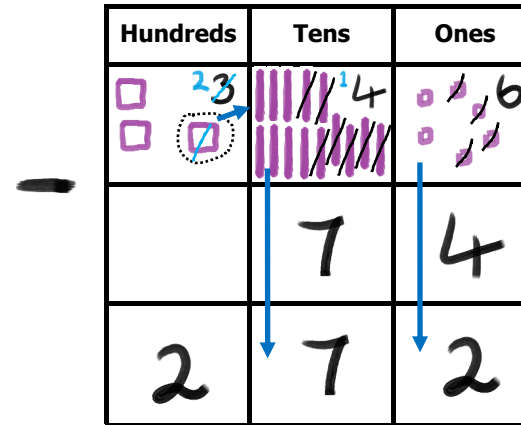
**Step 3:**
- **Tens** column (7 tens subtract 5 tens) - move down 5 tens from the top row to the middle row and then subtract them away. Move the remaining 2 tens down from the top to the bottom row.

**Step 4:**
- **Hundreds** column (8 hundreds subtract 3 hundreds) - move down 3 hundreds from the top row to the middle row and then subtract them away. Move the remaining 5 hundreds down from the top to the bottom row.

**Step 5:**
- There are 5 hundreds, 2 tens and 2 ones (522). **87 - 354 = 522**



**876 - 354 No exchange**



**876 - 354 No exchange**

$$
\begin{array}{r}
8\ 7\ 6 \\
-\ 3\ 5\ 4 \\
\hline
5\ 2\ 2
\end{array}
$$

### 873 - 349 Exchanging tens

**Step 1:**
- Position the counters on the grid (top row).

**Step 2:**
- **Ones** column (3 ones subtract 9 ones) - there needs to be an exchange here. Go to the tens column and exchange 1 ten for 10 ones. Add the 10 ones to the ones (top row) - you now have 13 ones. You have 6 tens left in the tens column, cross out the 7 and change to a 6 to show this.

**Step 3:**
- **Ones** column - now move down 9 counters from the top to the middle row and then subtract them away. Move the remaining 4 counters down from the top to the bottom row.
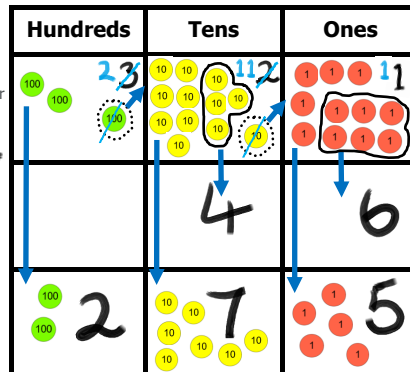
**Step 4:**
- **Tens** column (6 tens subtract 4 tens) - move down 4 tens from the top row to the middle row and then subtract them away. Move the remaining 2 tens down from the top to the bottom row.
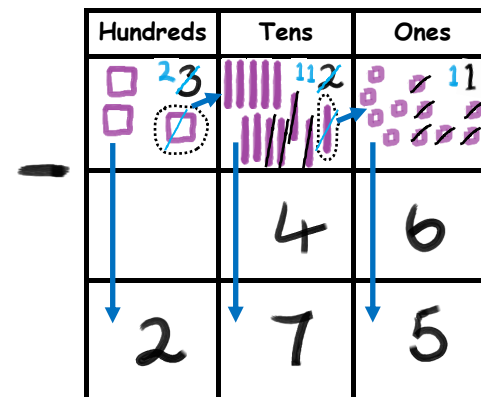
**Step 5:**
- **Hundreds** column (8 hundreds subtract 3 hundreds) - move the 3 hundreds from the top row to the middle row and then subtract them away. Move the remaining 5 hundreds down from the top to the bottom row.

**Step 6:**
- There are 5 hundreds, 2 tens and 4 ones (524). **873 - 349 = 524**
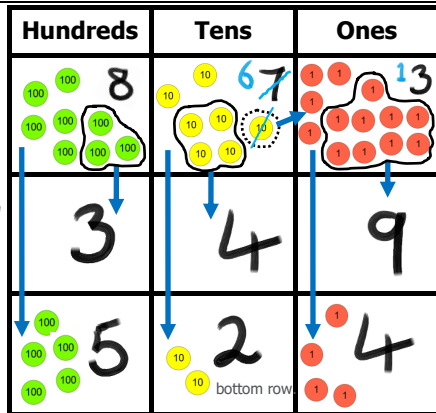


**873 - 349 Exchanging tens**
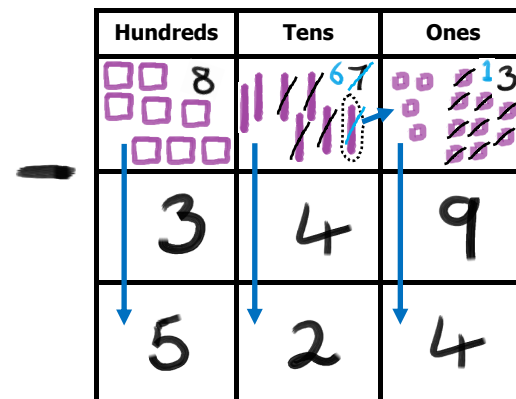


**873 - 349 Exchanging tens**

$$
\begin{array}{r}
8\ \ ^{6}\!\!\not{7}\ \ ^{1}3 \\
-\ 3\ 4\ 9 \\
\hline
5\ 2\ 4
\end{array}
$$

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Subtract numbers with up to three digits, using formal written methods of columnar subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex subtraction.
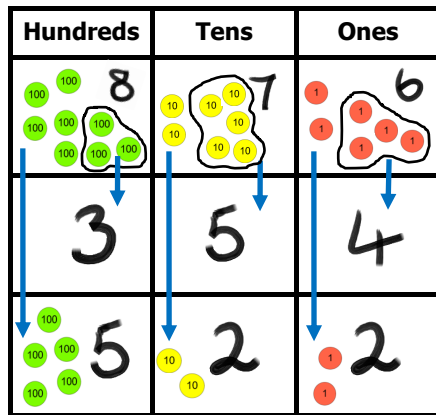
**Non-statutory requirements:**

- Practise solving varied subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar subtraction with increasingly large numbers up to three digits to become fluent.
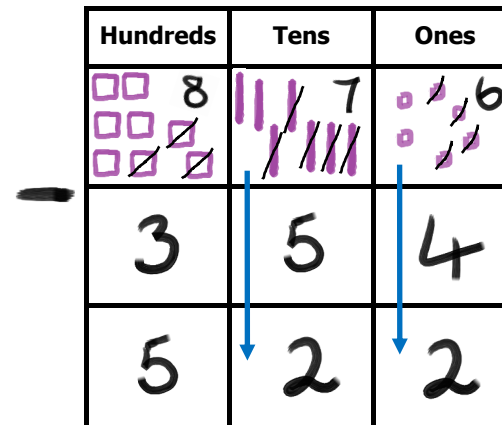
| Concrete | Pictorial | Abstract |
|---|---|---|

**817 - 352**
**Exchanging hundreds**

**Step 1:**
- Position the counters on the grid (top row).

**Step 2:**
- **Ones** column (7 ones subtract 2 ones) - move down 2 ones from the top to the middle row and then subtract them away. Move the remaining 5 ones down from the top to the bottom row.

**Step 3:**
- **Tens** column (1 ten subtract 5 tens) - there needs to be an exchange here. Go to the hundreds column and exchange 1 hundred for 10 tens. Add the 10 tens to the tens (top row) - you now have 11 tens. You have 7 hundreds left in the hundreds column - cross out the 8 and change to a 7 to show this.

**Step 4:**
- **Hundreds** column (7 hundreds subtract 3 hundreds) - move down 3 hundreds from the top row to the middle row and then subtract them away. Move the remaining 4 hundreds down from the top to the bottom row.

**Step 5:**
- There are 4 hundreds, 6 tens and 5 ones (465). **817 - 352 = 465**



**817 - 352**
**Exchanging hundreds**



**817 - 352**
**Exchanging hundreds**



**643 - 359**
**Exchanging tens and hundreds**

**Step 1:**
- Position the counters on the grid (top row).

**Step 2:**
- **Ones** column (3 ones subtract 9 ones) - there needs to be an exchange here. Go to the tens column and exchange 1 ten for 10 ones. Add the 10 ones to the ones (top row) - you now have 13 ones. You have 3 tens left in the tens column - cross out the 4 and change to a 3 to show this.

**Step 3:**
- **Ones** column (13 ones subtract 9 ones) - move down 9 ones from the top to the middle row and then subtract them away. Move the remaining 4 ones down from the top to the bottom row.

**Step 4:**
- **Tens** column (3 tens subtract 5 tens) - there needs to be an exchange here. Go to the hundreds column and exchange 1 hundred for 10 tens.
- Add the 10 tens to the tens (top row) - you now have 13 tens. You have 5 hundreds left in the hundreds column - cross out the 6 and change to a 5 to show this.

**Step 5:**
- **Tens** column (13 tens subtract 5 tens) - move down 5 tens from the top to the middle row and then subtract them away. Move the remaining 8 tens down from the top to the bottom row.

**Step 6:**
- **Hundreds** column (5 hundreds subtract 3 hundreds) - move 3 hundreds from the top row to the middle row and then subtract them away. Move the remaining 2 hundreds down from the top to the bottom row.

**Step 7:**
- There are 2 hundreds, 8 tens and 4 ones (284). **643 - 359 = 284**
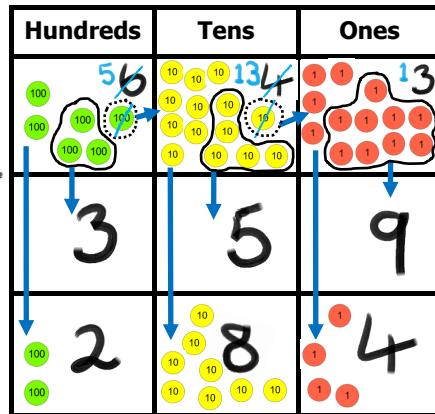


**643 - 359**
**Exchanging tens and hundreds**



**643 - 359**
**Exchanging tens and hundreds**



**Key Vocabulary:**
equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'

# Subtraction - Year 3 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

### National Curriculum statutory requirements:

- Subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- Subtract numbers with up to three digits, using formal written methods of columnar subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex subtraction.

### Non-statutory requirements:

- Practise solving varied subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Use understanding of place value and partitioning, and practise using columnar subtraction with increasingly large numbers up to three digits

| Concrete | Pictorial | Abstract |
|---|---|---|
| **803 - 356** Exchanging tens and hundreds with a zero in the tens column | **803 - 356** Exchanging tens and hundreds - with a zero in the tens column | **803 - 356** Exchanging tens and hundreds - with a zero in the tens column |

**803 - 356** Exchanging tens and hundreds with a zero in the tens column

Step 1:
- Position the counters on the grid (top row).

Step 2:
- **Ones** column (3 ones subtract 6 ones) - there needs to be an exchange here. Go to the tens column, the tens column has a zero so this cannot be exchanged therefore go to the hundreds column and exchange 1 hundred to 10 tens. In the hundreds column cross out the 8 and change to a 7 to show that you have 7 hundreds now.

Step 3:
- **Tens** column - place the exchanged 10 into the tens column (top row). You now have 10 tens in total. Show this by placing a 1 next to the zero. Now, 1 ten needs exchanging for 10 ones and adding to the ones column. Place a 1 next to the 3 to show that you now have 13 ones. To show that you have exchanged 1 ten from the tens column, cross out the 10 and replace with a 9 to show that you now have 9 tens left in this column.

Step 4:
- **Ones** column (13 ones subtract 6 ones) - move down 6 ones from the top row to the middle row and then subtract them away. Move the remaining 7 ones to the bottom row.
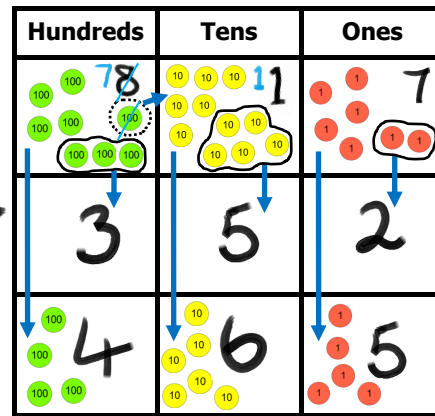
Step 5:
- **Tens** column (9 tens subtract 5 tens) - move down 5 tens from the top row to the middle row and then subtract them away. Move the remaining 4 tens to the bottom row.

Step 6:
- **Hundreds** column (7 hundreds subtract 3 hundreds) - move 3 hundreds from the top row to the middle row and then subtract them away. Move the remaining 4 hundreds down from the top to the bottom row.
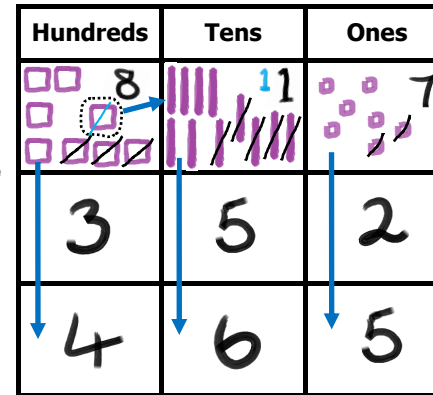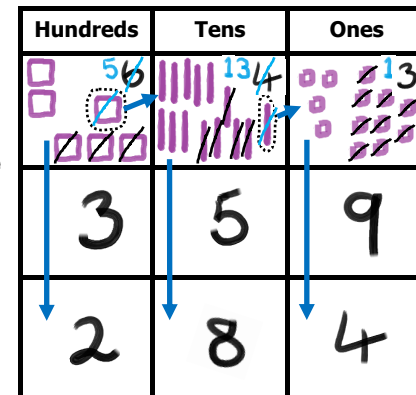
Step 6:
- There are 4 hundreds, 4 tens and 7 ones (447). **803 - 356 = 447**

**800 - 349** Exchanging tens and hundreds - with a zero in the ones and tens column

Step 1:
- Position the counters on the grid (top row).

Step 2:
- **Ones** column (0 ones subtract 9 ones) - there needs to be an exchange here. Go to the tens column, the tens column has a zero so this cannot be exchanged therefore go to the hundreds column and exchange 1 hundred to 10 tens. In the hundreds column cross out the 8 and change to a 7 to show that you have 7 hundreds now.

Step 3:
- **Tens** column - place the exchanged 10 into the tens column (top row). You now have 10 tens in total. Show this by placing a 1 next to the zero. Now, 1 ten needs exchanging for 10 ones and adding to the ones column. Place a 1 next to the 0 to show that you now have 10 ones. To show that you have exchanged 1 ten from the tens column, cross out the 1 and the 0 and replace with a 9 to show that you now have 9 tens left in this column.

Step 4:
- **Ones** column (10 ones subtract 9 ones) - move down 9 ones from the top row to the middle row and then subtract them away. Move the remaining one to the bottom row.

Step 5:
- **Tens** column (9 tens subtract 4 tens) - move down 4 tens from the top row to the middle row and then subtract them away. Move the remaining 5 tens to the bottom row.

Step 6:
- **Hundreds** column (7 hundreds subtract 3 hundreds) - move 3 hundreds from the top row to the middle row and then subtract them away. Move the remaining 4 hundreds down from the top to the bottom row.

Step 6:
- There are 4 hundreds, 5 tens and 1 one (451). **800 - 349 = 451**

| Concrete grid | Pictorial grid | Abstract |
|---|---|---|
| Hundreds / Tens / Ones | Hundreds / Tens / Ones | |

**800 - 349** Exchanging tens and hundreds - with a zero in the ones and tens column

### Key Vocabulary:

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 4 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

| |
|---|
| **Look at the previous learning and recap where appropriate.**<br>**In Year 4, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.** |

| **National Curriculum statutory requirements:** | **Non-statutory requirements:** |
|---|---|
| • Subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.<br>• Estimate and use inverse operations to check answers to a calculation.<br>• Solve subtraction two-step problems in contexts, deciding which operations and methods to use and why. | • Practise both mental methods and columnar subtraction with increasingly large numbers to aid fluency.<br>• Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. |

| |
|---|
| **Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**<br>**This section is split into stages of progression.** |

**STAGE 1: 7186 - 44**
**No exchange**

```
    7  1  8  6
 -        4  4
   _____
    7  1  4  2
```

**STAGE 2: 7186 - 67**
**Exchanging tens**

```
    7  1  7̶8  ¹6
 -           6  7
   _____
    7  1  1  9
```

**STAGE 3: 7326 - 62**
**Exchanging hundreds**

```
    7  ²3̶  ¹2  6
 -           6  2
   _____
    7  2  6  4
```

**STAGE 4: 7326 - 78**
**Exchanging tens and hundreds**

```
    7  ²3̶  ¹¹2̶  ¹6
 -              7  8
   _____
    7  2  4  8
```

**STAGE 5: 4857 - 342**
**No exchange**

```
    4  8  5  7
 -     3  4  2
   _____
    4  5  1  5
```

**STAGE 6: 4857 - 348**
**Exchanging tens**

```
    4  8  ⁴5̶  ¹7
 -        3  4  8
   _____
    4  5  0  9
```

**STAGE 7: 4857 - 592**
**Exchanging hundreds**

```
    4  ⁷8̶  ¹5  7
 -        5  9  2
   _____
    4  2  6  5
```

**STAGE 8: 9186 - 563**
**Exchanging thousands**

```
    ⁸9̶  ¹1  8  6
 -        5  6  3
   _____
    8  6  2  3
```

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 4 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 4, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

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

**Non-statutory requirements:**

- Practise both mental methods and columnar subtraction with increasingly large numbers to aid fluency.
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers.

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

## STAGE 9: 9186 - 563
### Exchanging thousands

```
  8 9  1 1  8  6
-       5  6  3
  _____
    8  6  2  3
```

## STAGE 10: 9786 - 597
### Exchanging tens and hundreds

```
  9  6 7  17 8  1 6
-        5  9  7
  _____
     9  1  8  9
```

## STAGE 11: 9786 - 957
### Exchanging hundreds and thousands

```
  8 9  1 7  7 8  1 6
-        9  5  7
  _____
     8  8  2  9
```

## STAGE 12: 9786 - 892
### Exchanging hundreds and thousands

```
  8 9  16 7  1 8  6
-        8  9  2
  _____
     8  8  9  4
```

## STAGE 13: 9757 - 968
### Exchanging tens, hundreds and thousands

```
  8 9  16 7  14 5  1 7
-         9  6  8
  _____
     8  7  8  9
```

## STAGE 14: 6857 - 2542
### No exchange

```
  6  8  5  7
- 2  5  4  2
  _____
  4  3  1  5
```

## STAGE 15: 7686 - 3367
### Exchanging tens

```
  7  6  7 8  1 6
- 3  3  6  7
  _____
  4  3  1  9
```

## STAGE 16: 7684 - 3591
### Exchanging hundreds

```
  7  5 6  1 8  4
- 3  5  9  1
  _____
  4  0  9  3
```

**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 4 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

| Look at the previous learning and recap where appropriate. In Year 4, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method. |
|---|

**National Curriculum statutory requirements:**

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

**Non-statutory requirements:**

- Practise both mental methods and columnar subtraction with increasingly large numbers to aid fluency.
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers.

| Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals. This section is split into stages of progression. |
|---|

**STAGE 17: 7286 - 2743**
*Exchanging thousands*

$$\begin{array}{r} {}^6\cancel{7}\ {}^1 2\ 8\ 6 \\ -\ 2\ 7\ 4\ 3 \\ \hline 4\ 5\ 4\ 3 \end{array}$$

**STAGE 18: 7235 - 5197**
*Exchanging tens and hundreds*

$$\begin{array}{r} 7\ {}^1\cancel{2}\ {}^{12}\cancel{3}\ {}^1 5 \\ -\ 5\ 1\ 9\ 7 \\ \hline 2\ 0\ 3\ 8 \end{array}$$

**STAGE 19: 7265 - 5437**
*Exchanging tens and thousands*

$$\begin{array}{r} {}^6\cancel{7}\ {}^1 2\ {}^5\cancel{6}\ {}^1 5 \\ -\ 5\ 4\ 3\ 7 \\ \hline 1\ 8\ 2\ 8 \end{array}$$

**STAGE 20: 7265 - 2984**
*Exchanging hundreds and thousands*

$$\begin{array}{r} {}^6\cancel{7}\ {}^{11}\cancel{2}\ {}^1 6\ 5 \\ -\ 2\ 9\ 8\ 4 \\ \hline 4\ 2\ 8\ 1 \end{array}$$

**STAGE 21: 7286 - 3597**
*Exchanging tens, hundreds and thousands*

$$\begin{array}{r} {}^6\cancel{7}\ {}^{11}\cancel{2}\ {}^{17}\cancel{8}\ {}^1 6 \\ -\ 3\ 5\ 9\ 7 \\ \hline 3\ 6\ 8\ 9 \end{array}$$

**STAGE 22: 7000 - 3591**
*Exchange including zeroes*

$$\begin{array}{r} {}^6\cancel{7}\ {}^9\cancel{\cancel{10}}\ {}^9\cancel{\cancel{10}}\ {}^{1} 0 \\ -\ 3\ 5\ 9\ 1 \\ \hline 3\ 4\ 0\ 9 \end{array}$$

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 5 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

| National Curriculum statutory requirements: | Non-statutory requirements: |
|---|---|
| • Subtract numbers mentally with increasingly large numbers <br> • Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction) <br> • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy <br> • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | • Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency. <br> • They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). |

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

- **STAGE 1** - **no exchanges**
- **STAGE 2** - **one exchange** *(exchange one of: tens, hundred and thousands - all three to be practiced and successfully accomplished)*
- **STAGE 3** - **two exchanges** *(include different combinations of tens, hundreds and thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 4** - **three exchanges** *(tens, hundreds and thousands - to be practiced and successfully accomplished before moving on to the next stage)*

$$TTh \quad Th \quad H \quad T \quad O$$
$$- \qquad\qquad H \quad T \quad O$$

- **STAGE 1** - **no exchanges**
- **STAGE 2** - **one exchange** *(exchange one of: tens, hundred, thousands and ten thousands - all four to be practiced and successfully accomplished)*
- **STAGE 3** - **two exchanges** *(include different combinations of tens, hundreds, thousands and ten thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 4** - **three exchanges** *(include different combinations of tens, hundreds, thousands and ten thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 5** - **four exchanges** *(tens, hundreds, thousands and ten thousands - to be practiced and successfully accomplished before moving on to the next stage)*

$$TTh \quad Th \quad H \quad T \quad O$$
$$- \qquad Th \quad H \quad T \quad O$$

- **STAGE 1** - **no exchanges**
- **STAGE 2** - **one exchange** *(exchange one of: tens, hundred, thousands and ten thousands - all four to be practiced and successfully accomplished)*
- **STAGE 3** - **two exchanges** *(include different combinations of tens, hundreds, thousands and ten thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 4** - **three exchanges** *(include different combinations of tens, hundreds, thousands and ten thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 5** - **four exchanges** *(tens, hundreds, thousands and ten thousands - to be practiced and successfully accomplished before moving on to the next stage)*

$$TTh \quad Th \quad H \quad T \quad O$$
$$- \quad TTh \quad Th \quad H \quad T \quad O$$

- **STAGE 1** - **no exchanges**
- **STAGE 2** - **one exchange** *(exchange one of: tens, hundred and thousands - all three to be practiced and successfully accomplished)*
- **STAGE 3** - **two exchanges** *(include different combinations of tens, hundreds and thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 4** - **three exchanges** *(tens, hundreds and thousands - to be practiced and successfully accomplished before moving on to the next stage)*

$$HTh \quad TTh \quad Th \quad H \quad T \quad O$$
$$- \qquad\qquad\qquad H \quad T \quad O$$

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 5 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Subtract numbers mentally with increasingly large numbers
- Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)
- 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

**Non-statutory requirements:**

- Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency.
- They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 − 2300 = 10 162).

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

- **STAGE 1** - **no exchanges**
- **STAGE 2** - **one exchange** *(exchange one of: tens, hundred, thousands and ten thousands - all four to be practiced and successfully accomplished)*
- **STAGE 3** - **two exchanges** *(include different combinations of tens, hundreds, thousands and ten thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 4** - **three exchanges** *(include different combinations of tens, hundreds, thousands and ten thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 5** - **four exchanges** *(tens, hundreds, thousands and ten thousands - to be practiced and successfully accomplished before moving on to the next stage)*

| HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|
| | | Th | H | T | O |

- **STAGE 1** - **no exchanges**
- **STAGE 2** - **one exchange** *(exchange one of: tens, hundred, thousands, ten thousands and hundred thousands - all five to be practiced and successfully accomplished)*
- **STAGE 3** - **two exchanges** *(include different combinations of tens, hundreds, thousands, ten thousands and hundred thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 4** - **three exchanges** *(include different combinations of tens, hundreds, thousands, ten thousands and hundred thousands - all combinations to be practiced and successfully accomplished)*
- **STAGE 5** - **four exchanges** *(include different combinations of tens, hundreds, thousands, ten thousands and hundred thousands - to be practiced and successfully accomplished)*

| HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|
| | TTh | Th | H | T | O |

Ensure that children are confident with exchange when a number includes zeroes e.g:

$$78000 - 5692 = 72308$$

$$945000 - 49794 = 900206$$

$$600000 - 248598 = 351402$$

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 5 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

| National Curriculum statutory requirements: | Non-statutory requirements: |
|---|---|
| • Subtract numbers mentally with increasingly large numbers<br>• Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)<br>• Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy<br>• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | • Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency.<br>• They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). |

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

**STAGE 1 - 6.7 - 4.3**
**No exchange**

```
  6 . 7
-   4 . 3
---------
  2 . 4
```

**STAGE 2 - 6.7 - 4.9**
**Exchanging ones**

```
  ⁵6 . ¹7
-   4 . 9
---------
  1 . 8
```

**STAGE 3 - 5.78 - 2.54**
**No exchange**

```
  5 . 7 8
-   2 . 5 4
-----------
  3 . 2 4
```

**STAGE 4 - 5.78 - 2.59**
**Exchanging tenths**

```
  5 . ⁶7 ¹8
-   2 . 5 9
-----------
  3 . 1 9
```

**STAGE 5 - 5.78 - 2.94**
**Exchanging ones**

```
  ⁴5 . ¹7 8
-   2 . 9 4
-----------
  2 . 8 4
```

**STAGE 6 - 5.38 - 4.89**
**Exchanging tenths and ones**

```
  ⁴5 . ¹²3 ¹8
-   4 . 8 9
-----------
  0 . 4 9
```

**STAGE 7 - 65.7 - 24.4**
**No exchange**

```
  6 5 . 7
-   2 4 . 4
-----------
  4 1 . 3
```

**STAGE 8 - 65.7 - 24.9**
**Exchanging ones**

```
  6 ⁴5 . ¹7
-   2 4 . 9
-----------
  4 0 . 8
```

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 5 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

| Look at the previous learning and recap where appropriate. |
|---|
| **In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.** |

| **National Curriculum statutory requirements:** | **Non-statutory requirements:** |
|---|---|
| • Subtract numbers mentally with increasingly large numbers <br>• Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction) <br>• Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy <br>• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | • Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency. <br>• They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). |

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

**STAGE 9 - 65.7 - 28.2**
**Exchanging tens**

```
    5 6  1 5 . 7
  -   2  8 . 2
  ─────────────
      3  7 . 5
```

**STAGE 10 - 65.7 - 28.9**
**Exchanging ones and tens**

```
    5 6  14 5 . 1 7
  -   2     8 . 9
  ────────────────
      3     6 . 8
```

**STAGE 11 - 75.78 - 30.14**
**No exchange**

```
  7 5 . 7 8
- 3 0 . 1 4
───────────
  4 5 . 6 4
```

**STAGE 12 - 75.72 - 34.05**
**Exchanging tenths**

```
  7 5 . 6 7  1 2
- 3 4 . 0    5
───────────────
  4 1 . 6    7
```

**STAGE 13 - 75.78 - 34.95**
**Exchanging ones**

```
  7 4 5 . 1 7 8
- 3   4 . 9  5
──────────────
  4   0 . 8  3
```

**STAGE 14 - 75.78 - 36.14**
**Exchanging tens**

```
  6 7  1 5 . 7 8
- 3      6 . 1 4
────────────────
  3      9 . 6 4
```

**STAGE 15 - 75.71 - 34.94**
**Exchanging tenths and ones**

```
  7 4 5 . 16 7  1 1
- 3   4 . 9     4
──────────────────
  4   0 . 7     7
```

**STAGE 16 - 75.08 - 39.54**
**Exchanging ones and tens**

```
  6 7  14 5 . 1 0 8
- 3      9 . 5  4
──────────────────
  3      5 . 5  4
```

**Key Vocabulary:**

*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 5 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

| **National Curriculum statutory requirements:** | **Non-statutory requirements:** |
|---|---|
| • Subtract numbers mentally with increasingly large numbers<br>• Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)<br>• Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy<br>• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why | • Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency.<br>• They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). |

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

### STAGE 17 - 75.32 - 36.19
**Exchanging tenths and tens**

$$
\begin{array}{r}
^{6}\!\!\not{7}\ ^{1}5\ .\ ^{2}\!\not{3}\ ^{1}2 \\
-\ 3\ 6\ .\ 1\ 9 \\
\hline
3\ 9\ .\ 1\ 3 \\
\hline
\end{array}
$$

### STAGE 18 - 75.18 - 36.39
**Exchanging tenths, ones and tens**

$$
\begin{array}{r}
^{6}\!\!\not{7}\ ^{14}\!\!\not{5}\ .\ ^{10}\!\not{1}\ ^{1}8 \\
-\ 3\ 6\ .\ 3\ 9 \\
\hline
3\ 8\ .\ 7\ 9 \\
\hline
\end{array}
$$

### STAGE 19 including:
no exchange
one exchange
two exchanges
three exchanges

$$
\begin{array}{r}
H\ T\ O\ .\ t \\
-\ H\ T\ O\ .\ t \\
\hline
H\ T\ O\ .\ t \\
\hline
\end{array}
$$

### STAGE 20 including:
no exchange
one exchange
two exchanges
three exchanges
four exchanges

$$
\begin{array}{r}
H\ T\ O\ .\ t\ h \\
-\ H\ T\ O\ .\ t\ h \\
\hline
H\ T\ O\ .\ t\ h \\
\hline
\end{array}
$$

### STAGE 21 including:
no exchange
one exchange
two exchanges
three exchanges
four exchanges

$$
\begin{array}{r}
Th\ H\ T\ O\ .\ t \\
-\ Th\ H\ T\ O\ .\ t \\
\hline
Th\ H\ T\ O\ .\ t \\
\hline
\end{array}
$$

### STAGE 22 including:
no exchange
one exchange
two exchanges
three exchanges
four exchanges
five exchanges

$$
\begin{array}{r}
Th\ H\ T\ O\ .\ t\ h \\
-\ Th\ H\ T\ O\ .\ t\ h \\
\hline
Th\ H\ T\ O\ .\ t\ h \\
\hline
\end{array}
$$

### STAGE 23 including:
no exchange
one exchange
two exchanges
three exchanges
four exchanges
five exchanges

$$
\begin{array}{r}
Tth\ Th\ H\ T\ O\ .\ t \\
-\ Tth\ Th\ H\ T\ O\ .\ t \\
\hline
Tth\ Th\ H\ T\ O\ .\ t \\
\hline
\end{array}
$$

**STAGE 21:** once secure, children to be taught to subtract decimal numbers (up to six-digits) with a different number of places (including exchanges) e.g. 65.7 - 24, 80.73 - 9.9, 2365 - 824.93

*Place holders needed here (see 0s below).*
*Ensure this is addressed when teaching columnar subtraction.*

$$
\begin{array}{r}
6\ 5\ .\ 7 \\
-\ 2\ 4\ .\ 0 \\
\hline
\end{array}
\qquad
\begin{array}{r}
8\ 0\ .\ 7\ 3 \\
-\ \ \ 9\ .\ 9\ 0 \\
\hline
\end{array}
$$

$$
\begin{array}{r}
2\ 3\ 6\ 5\ .\ 0\ 0 \\
-\ \ 8\ 2\ 4\ .\ 9\ 3 \\
\hline
\end{array}
$$

### Key Vocabulary:
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Subtraction - Year 6   Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate thus developing Year 5 experiences.**
**Throughout Year 6, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method. If**

**National Curriculum statutory requirements:**
- Perform mental calculations, including with mixed operations and large numbers
- Solve problems involving subtraction
- Solve subtraction multi-step problems in contexts, deciding which operations and methods
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- Use their knowledge of the order of operations to carry out calculations involving the four operations

**Non-statutory requirements:**
- Pupils practise addition for larger numbers, using the formal written methods.
- They undertake mental calculations with increasingly large numbers and more complex calculations.
- Pupils round answers to a specified degree of accuracy, e.g. to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.
- Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

**STAGE 1 - whole numbers with the same number of places:** no exchange, one exchange, multiple exchanges

*E.g. maximum expectation shown below (though can go into 10 million)*

|   | M | HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|---|---|
|   | M | HTh | TTh | Th | H | T | O |
| - | M | HTh | TTh | Th | H | T | O |
|   | M | HTh | TTh | Th | H | T | O |

**STAGE 2 - whole numbers with a different number of places:** no exchange, one exchange, multiple exchanges

*E.g. maximum expectation shown below*

|   | M | HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|---|---|
|   | M | HTh | TTh | Th | H | T | O |
| - |   | HTh | TTh | Th | H | T | O |
|   | M | HTh | TTh | Th | H | T | O |

**STAGE 3  - decimal numbers with the same number of places:** no exchange, one exchange, multiple exchanges

*E.g. maximum expectation shown below (though can go into 10 million)*

|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|----|
|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |
| - | M | HTh | TTh | Th | H | T | O | . | t | h | th |
|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |

**STAGE 4 - decimal numbers with a different number of places:** no exchange, one exchange, multiple exchanges

**E.g 1**

|   | TTh | Th | H | T | O | . | t |   |    |
|---|-----|----|---|---|---|---|---|---|----|
|   |     |    | H | T | O | . | t | h |    |
| - |     |    |   |   |   |   |   |   |    |
|   | TTh | Th | H | T | O | . | t | h |    |

**N.B. you can go up to a million and up to thousandths**

**STAGE 4 - decimal numbers with a different number of places:** no exchange, one exchange, multiple exchanges

**E.g 2**

|   | HTh | TTh | Th | H | T | O | . | t | h |    |
|---|-----|-----|----|---|---|---|---|---|---|----|
|   |     |     | Th | H | T | O | . | t | h | th |
| - |     |     |    |   |   |   |   |   |   |    |
|   | TTh | Th  | H  | T | O | . | t | h | th |    |

**N.B. you can go up to a million and up to thousandths**

**STAGE 4 - decimal numbers with a different number of places:** no exchange, one exchange, multiple exchanges

**E.g 3**

|   | M | HTh | TTh | Th | H | T | O | . | t | h | th |
|---|---|-----|-----|----|---|---|---|---|---|---|----|
|   |   | HTh | TTh | Th | H | T | O | . | t |   |    |
| - |   |     |     |    |   |   |   |   |   |   |    |
|   |   |     | TTh | Th | H | T | O | . | t | h | th |

**N.B. you can go up to a million and up to thousandths**

**Key Vocabulary:**
*equal to, take, less, leaves, take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'*

# Multiplication - Year 1 Calculation Policy

**In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.**
**Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.**

**National Curriculum statutory requirements:**

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

**Non-statutory requirements:**

- Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.

- They make connections between arrays, number patterns, and counting in twos, fives and tens.

| Concrete | Pictorial | Abstract |
|---|---|---|
| **Recognising and making equal and unequal groups.** <br><br>  <br><br> Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. <br><br>  | **Recognising and making equal and unequal groups.** <br><br> Children draw and represent equal and unequal groups. <br><br>  | **Recognising and making equal and unequal groups.** <br><br> **Describe equal groups** <br><br> *This is 3 equal groups of 4* <br><br> *(4 and 4 and 4)* |
| **Doubling** <br> Use manipulatives to show how to double a number. <br><br>  <br><br> ***Double 4 is 8 (4 + 4 = 8)*** <br><br> ***Double 5 is 10 (5 + 5 = 10)*** | **Doubling** <br> Draw doubles using a range of representations. <br><br>  <br><br> **Double 6 is 12 (6 + 6 = 12)** | **Doubling** <br><br> $5 + 5 = ?$ <br> $14 = 7 + 7$ <br><br> Partition a number and then double each part before recombining. <br><br> Double <br><br>  <br><br> Double 12 is 24. |
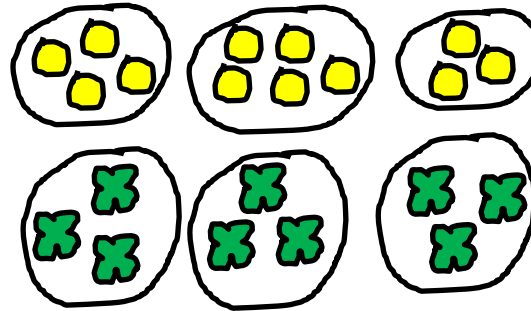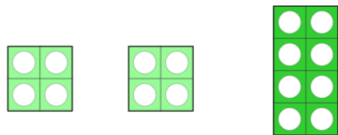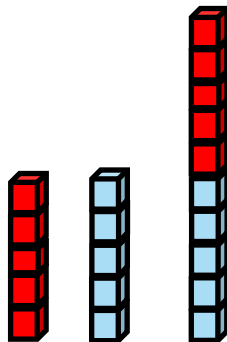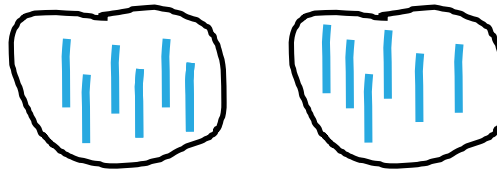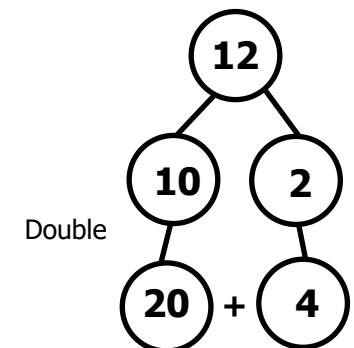
**Key Vocabulary:**

*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 1 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

In Year 1, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.
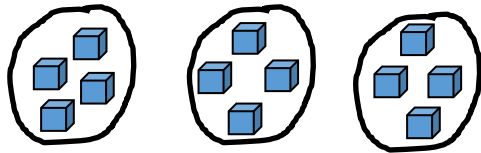
**National Curriculum statutory requirements:**

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

**Non-statutory requirements:**

- Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.

- They make connections between arrays, number patterns, and counting in twos, fives and tens.

| Concrete | Pictorial | Abstract |
|---|---|---|
| **Recognising and making equal groups (repeated addition).** <br><br> *There are 5 equal groups with 3 in each group.* <br><br> *3 + 3 + 3 + 3 + 3 = 15* <br><br> *There are 4 equal groups with 4 in each group.* <br><br> *4 + 4 + 4 + 4 = 15* <br><br> *Children* **can** *begin to relate this to multiplication if ready.* | **Recognising and making equal groups (repeated addition).** <br> Use pictorial representations including numberlines to solve calculations. <br><br> 0 1 2 3 4 5 6 7 8 9 10 <br><br> ? | **Recognising and making equal groups (repeated addition).** <br><br> *4 + 4 + 4 = 12* <br><br> *3 lots of 4 = 12* <br><br> *3 x 4 = 12* |
| **Counting in multiples of 2, 5 and 10.** <br> Count in multiples supported by concrete objects placed into equal groups (skip counting) | **Counting in multiples of 2, 5 and 10.** <br> Use a numberline and other pictorial presentations to support counting in multiples. <br><br> 0  2  4  6  8  10  12 | **Counting in multiples of 2, 5 and 10.** <br> Count in multiples of number aloud. <br><br> Write sequences with multiples of numbers. <br><br> Write the missing numbers in the sequence. <br><br> **2, 4, 6, 8, 10, 12, 14, 16, 18, 20** <br><br> **5, 10, 15, 20, 25, 30** |
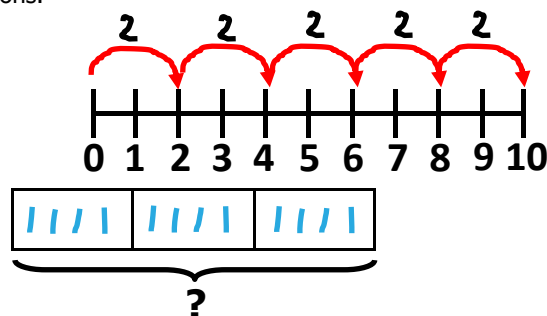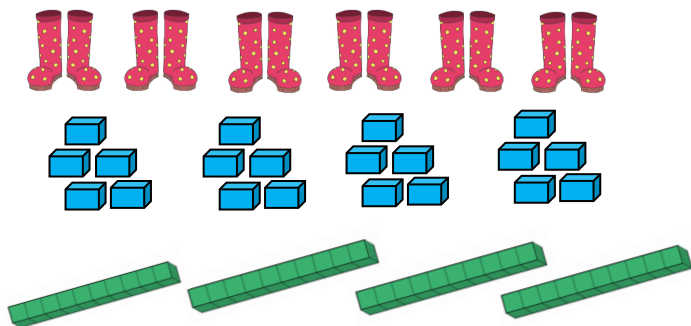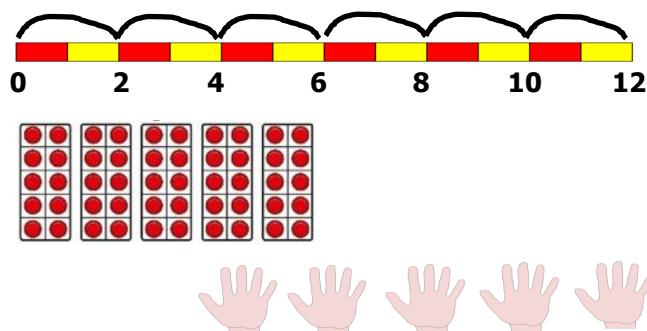
**Key Vocabulary:**
*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 2 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

Look at the previous learning and recap where appropriate.
In Year 2, children should be encouraged to use the CPA approach to embed their understanding of number and their relationships.
Where possible the concrete, pictorial and abstract should be shown alongside each other so that the children can make links between the way the calculation can be represented.
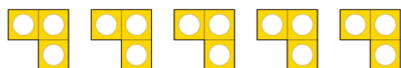
**National Curriculum statutory requirements:**

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ($\times$), division ($\div$) and equals ($=$) signs
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

**Non-statutory requirements:**

- Pupils use a variety of language to describe multiplication and division.
- Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.
- Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, $40 \div 2 = 20$, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$).
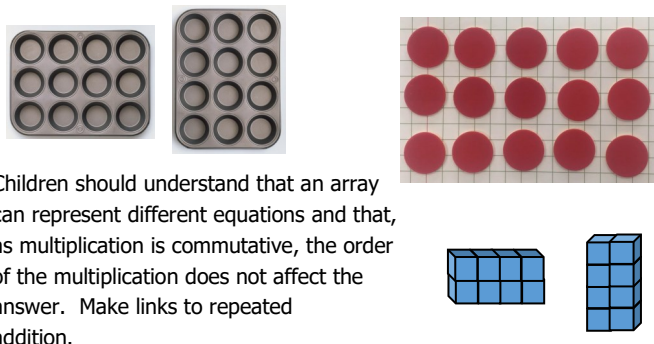
| Concrete | Pictorial | Abstract |
|---|---|---|
| **Create arrays to illustrate commutativity using a range of concrete objects.** <br><br> Children should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer. Make links to repeated addition. | **Create arrays to illustrate commutativity using a range of concrete objects.** <br><br> Children to represent the arrays pictorially. | **Create arrays to illustrate commutativity using a range of concrete objects.** <br><br> Children to be able to use an array to write a range of calculations e.g. <br> $10 = 2 \times 5$ <br> $5 \times 2 = 10$ <br> $2 + 2 + 2 + 2 + 2 = 10$ <br> $10 = 5 + 5$ |
| **Building on from Year 1, learn the ×2, ×5 and ×10 table facts .** <br> Develop an understanding of how to unitise groups of 2, 5 and 10 and learn corresponding times-table facts. <br><br> Groups of 10 … <br> 10, 20, 30 <br> $3 \times 10 = 30$ | **Building on from Year 1, learn the ×2, ×5 and ×10 table facts .** <br> Understand how to relate counting in unitised groups and repeated addition with knowing key times-table facts <br><br> $10 + 10 + 10 = 30$ <br><br> $3 \times 10 = 30$ | **Building on from Year 1, learn the ×2, ×5 and ×10 table facts.** <br><br> Understand how the times-tables increase and contain patterns. <br><br> $5 \times 10 = 50$ <br><br> $6 \times 10 = 60$ |
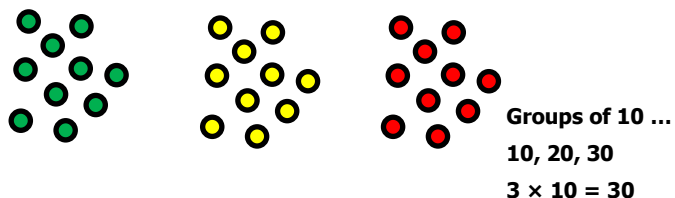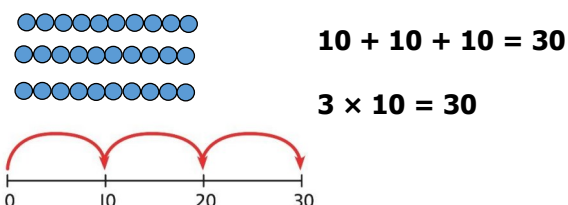
**Key Vocabulary:**
*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 3  Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

- Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

- Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

**Non-statutory requirements:**

- Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.
- Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).
- Pupils develop reliable written methods for multiplication, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication.
- Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?

| Concrete | Pictorial | Abstract |
|---|---|---|

**13 x 3** Two-digit by one-digit (no exchange into tens)

**Either** Base 10 or place value counters can be used here.
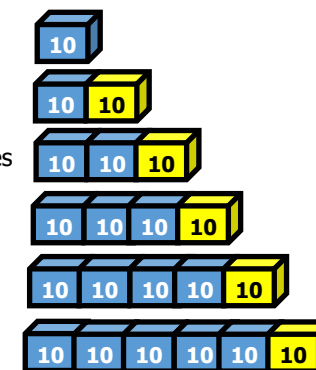
**Step 1:**
- Partition the 13 into 10 and 3 and write these numbers on the grid in the correct columns. Place the number that you are multiplying the 13 by at the side (see the 3 on the diagram).

**Step 2:**
- Use concrete resources to represent the 10 and 3 and position them in the grid in the top row.

**Step 3:**
- 13 is being multiplied by 3 so you need three rows of 13 in total. Add two more rows of 13 using the concrete resources. You now have 3 lots of 13.

**Step 4:**
- Count up all the ones - you have 9 in total. Write this number on the grid.

**Step 5:**
- Count up all the tens - you have 30 in total. Write this number on the grid.

**Step 6:**
- Add the two totals together (30 + 9). **13 x 3 = 39**

**13 x 3** Two-digit by one-digit (no exchange into tens)

**13 x 3** Two-digit by one-digit (no exchange into tens)
**Expanded short multiplication first.**

$$
\begin{array}{cc}
 & 1 \quad 3 \\
\times & \quad 3 \\
\hline
 & 9 \quad (3 \times 3) \\
+ & 3 \quad 0 \quad (3 \times 10) \\
\hline
 & 3 \quad 9 \\
\hline
\end{array}
$$

**14 x 4** Two-digit by one digit (exchange into tens)

**Step 1:**
- Partition the 14 into 10 and 4 and write these numbers on the grid in the correct columns. Place the number that you are multiplying the 14 by at the side (see the 4 on the diagram).

**Step 2:**
- Use concrete resources to represent the 10 and 4 and position them in the grid in the top row.

**Step 3:**
- 14 is being multiplied by 4 so you need four rows of 14 in total. Add three more rows of 14 using the concrete resources. You now have 4 lots of 14.

**Step 4:**
- Count up all the ones - you have 16 in total. Write this number on the grid.

**Step 5:**
- Count up all the tens - you have 40 in total. Write this number on the grid.

**Step 6:**
- Model that the 16 can be partitioned into one 10 and 6 ones, the ten here can be exchanged into the tens column.

**Step 7:**
- Add the two totals together (40 + 16). **14 x 4 = 56**

**14 x 4** Two-digit by one digit (exchange into tens)

**14 x 4** Two-digit by one digit (with exchange into tens)
**Expanded short multiplication first.**

$$
\begin{array}{cc}
 & 1 \quad 4 \\
\times & \quad 4 \\
\hline
 & 1 \quad 6 \quad (4 \times 4) \\
+ & 4 \quad 0 \quad (4 \times 10) \\
\hline
 & 5 \quad 6 \\
\hline
\end{array}
$$

**Key Vocabulary:**
_double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'_

# Multiplication - Year 3 Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 3, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

- Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

- Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

**Non-statutory requirements:**

- Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables.
- Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).
- Pupils develop reliable written methods for multiplication, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication.
- Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?)

| Concrete | Pictorial | Abstract |
|---|---|---|

## 22 x 4 Two-digit by one-digit (no exchange into tens)

**Either** Base 10 or place value counters can be used here.

**Step 1:**
- Partition the 22 into 20 and 2 and write these numbers on the grid in the correct columns. Place the number that you are multiplying the 22 by at the side (see the 4 on the diagram).

**Step 2:**
- Use concrete resources to represent the 20 and 2 and position them in the grid at the top.

**Step 3:**
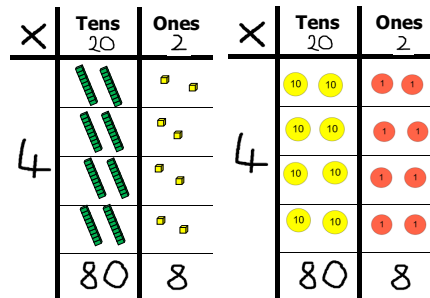- 22 is being multiplied by 4 so you need four rows of 22 in total. You now have 4 lots of 22.

**Step 4:**
- Count up all the ones - you have 8 in total. Write this number on the grid.

**Step 5:**
- Count up all the tens - you have 80 in total. Write this number on the grid.

**Step 6:**
- Add the two totals together (80 + 8). **22 x 4 = 88**



### 22 x 4 Two-digit by one-digit (no exchange into tens)



### 22 x 4 Two-digit by one-digit (no exchange into tens)

Expanded short multiplication alongside compact short multiplication.



## 30 x 8 Two-digit by one digit (exchange into tens)

**N.B. Base 10 can still be used.**

**Step 1:**
- Partition the 38 into 30 and 8 and write these numbers on the grid in the correct columns. Place the number that you are multiplying the 38 by at the side (see the 4 on the diagram).

**Step 2:**
- Use concrete resources to represent the 30 and 8 and position them in the grid in the top row.

**Step 3:**
- 38 is being multiplied by 4 so you need four rows of 38 in total. Add three more rows of 38 using the concrete resources. You now have 4 lots of 38.

**These three steps apply to expanded short multiplication:**

**Step 4:**
- Count up all the ones - you have 32 in total. Write this number on the grid.

**Step 5:**
- Count up all the tens - you have 120 in total. Write this number on the grid.

**Step 6:**
- Add the two total together (120 + 32). 38 x 8 = 152

**These three steps apply to expanded short multiplication:**

**Step 4:**
- Combine all the ones. You have 32 ones. Exchange 30 ones for 3 tens and move these across to the 10s column.

**Step 5:**
- Combine all the tens (in addition to the 3 tens exchanged in previous step). You have 15 tens. Exchange 10 tens to 1 hundred and move this across to the hundreds column.

**Step 6:**
- There should now be 1 hundred (in the hundreds column) 5 tens (in the tens column) and 2 ones (in the ones column). **38 x 4 = 152.**
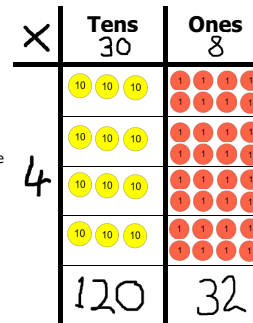


### 38 x 4 Two-digit by one digit (exchange into tens)
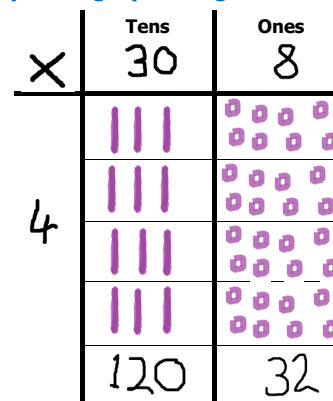


### 38 x 4 Two-digit by one digit (exchange into tens).

Expanded short multiplication first alongside compact short multiplication.



*It is important that the whole school adopt the same 'carry' positions for these numbers.*

## Key Vocabulary:

*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 4  Calculation Policy

**Look at the previous learning and recap where appropriate.**
**In Year 4, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

### National Curriculum statutory requirements:

- Recall multiplication and division facts for multiplication tables up to $12 \times 12$
- Recognise and use factor pairs and commutativity in mental calculations
- Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1 and multiplying together three numbers
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

### Non-statutory requirements:

- Pupils practise recalling and using multiplication tables and related division facts to aid fluency.
- Pupils practise mental methods and extend this to three-digit numbers to derive facts, (e.g. $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).
- Pupils are fluent in the formal written method of short multiplication with exact answers.
- Pupils write statements about the equality of expressions (e.g. use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations e.g, $2 \times 6 \times 5 = 10 \times 6 = 60$.
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

---

### STAGE 1: 324 x 2 Three-digit by one-digit (no exchange)
Base 10 or place value counters can be used here if needed.

Both methods for multiplication are shown below - most pupils should move to the compact method once secure with the expanded.

```
    3  2  4
 x        2
 ---------
          8   (2 x 4)
 +     4  0   (2 x 20)
    6  0  0   (2 x 300)
 ---------
    6  4  8
```

```
    3  2  4
 x        2
 ---------
    6  4  8
```

### STAGE 2: 323 x 5 Three-digit by one-digit (with exchange)
Base 10 or place value counters can be used here (if needed).

```
    3  2  3
 x        5
 ---------
       1  5   (5 x 3)
 +  1  0  0   (5 x 20)
 1  5  0  0   (5 x 300)
 ---------
 1  6  1  5
```

*It is important that the whole school adopt the same 'carry' positions for these numbers.*

```
    3  2  3
 x        5
 ---------
 1  6  1  5
    1  1
```

---

### Key Vocabulary:
*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 5 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

## National Curriculum statutory requirements:

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
- Establish whether a number up to 100 is prime and recall prime numbers up to 19
- Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

## Non-statutory requirements:

- Pupils practise and extend their use of the formal written methods of short multiplication . They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.
- They use and understand the terms factor, multiple and prime, square and cube numbers.
- Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and meters.
- Distributivity can be expressed as a(b + c) = ab + ac.
- They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10).
- Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x ? ).

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**
**This section is split into stages of progression.**

### STAGE 1: 3124 x 6 Four-digit by a one-digit (with exchange)
**Base 10 or place value counters can be used here if needed.**
**The children should now be secure with the compact method, however some children may still be working on the expanded method initially.**

```
    3 1 2 4
x         6
  ‾‾‾‾‾‾‾‾‾
  1 8 7 4 4
      1   2
```

*It is important that the whole school adopt the same 'carry' positions for these numbers.*

### STAGE 2: 42 x 17 Two-digit by a two-digit (with exchange)
**The children should look at the expanded method here to develop an understanding of the method.**

*Only when the children are secure, should they be moved on to the compact method.*

```
      4 2
x     1 7
  ‾‾‾‾‾‾‾
      1 4   (7 x 2)
    2 8 0   (7 x 40)
+     2 0   (10 x 2)
    4 0 0   (10 x 40)
  ‾‾‾‾‾‾‾
    7 1 4
      1
```

```
      4 2
x     1 7
  ‾‾‾‾‾‾‾
    2 9 4
       1
    4 2 0
  ‾‾‾‾‾‾‾
    7 1 4
      1
```

*Explain the importance of the zero here. We add a zero because we are multiplying by the tens digit.*

## Key Vocabulary:

*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 5 Calculation Policy

Voyage
EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**

**In Year 5, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
- Establish whether a number up to 100 is prime and recall prime numbers up to 19
- Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

**Non-statutory requirements:**

- Pupils practise and extend their use of the formal written methods of short multiplication . They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.
- They use and understand the terms factor, multiple and prime, square and cube numbers.
- Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and meters.
- Distributivity can be expressed as a(b + c) = ab + ac.
- They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10).
- Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x  ? ).

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals.**

**This section is split into stages of progression.**

## STAGE 3: 534 x 16 *Three-digit by a two-digit (with exchange)*

The children should look at the expanded method first to develop an understanding of the calculation.

```
      5   3   4
  x           1   6
          2   4      (6 x 4)
      1   8   0      (6 x 30)
  3   0   0   0      (6 x 500)
          4   0      (10 x 4)
      3   0   0      (10 x 30)
  5   0   0   0      (10 x 500)
  8   5   4   4
              1
```

*Only when the children are secure, should they be moved on to the compact method.*

```
      5   3   4
  x           1   6
  3  ₂2  ₂0   4
  5   3   4   0
  8   5   4   4
```

*It is important that the whole school adopt the same 'carry' positions for these numbers.*

## STAGE 4: 3234 x 18 *Four-digit by a two-digit*

```
  3   2   3   4
  x               1   8
              3   2      (8 x 4)
          2   4   0      (8 x 30)
      1   6   0   0      (8 x 200)
  2   4   0   0   0      (8 x 3000)
              4   0      (10 x 4)
          3   0   0      (10 x 30)
      2   0   0   0      (10 x 200)
  3   0   0   0   0      (10 x 3000)
  5   8   2   1   2
          1       1
```

*If the children are secure with the compact method, move straight on to this.*

```
          3   2   3   4
  x                   1   8
  2  ₁5  ₂8  ₃7   2
  3   2   3   4   0
  5   8   2   1   2
              1       1
```

## Key Vocabulary:

*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*

# Multiplication - Year 6 Calculation Policy

**Voyage** EDUCATION PARTNERSHIP

**Look at the previous learning and recap where appropriate.**
**In Year 6, children should be encouraged to consider whether they can calculate mentally, with or without jottings before using a written method.**

**National Curriculum statutory requirements:**
- Identify common factors, common multiples and prime numbers
- Perform mental calculations, including with mixed operations and large numbers
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- Solve problems involving the four operations
- Use their knowledge of the order of operations to carry out calculations involving the four operations

**Non-statutory requirements:**
- Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division.
- They undertake mental calculations with increasingly large numbers and more complex calculations.
- Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.
- Pupils round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.
- Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.
- Common factors can be related to finding equivalent fractions.

**Some children may still need the CPA approach, please see earlier work, especially when dealing with larger numbers or decimals, in particular place value counters may be beneficial here.**

Once the children are secure with multiplying whole numbers (up to 4 digits by two-digits) move on to decimal numbers.

**STAGE 1: 16.2 x 4** Up to tenths multiplied by a one-digit number

*No exchange initially.*

```
    1   6 • 2
  x       4
  ─────────────
    0 • 8       (4 x 0.2)
+ 2   4 • 0     (4 x 6)
  4   0 • 0     (4 x 10)
  ─────────────
  6   4 • 8
```

```
    1   6 • 2
  x       4
  ─────────────
    6   4 • 8
        2
```

*Only when the children are secure, should they be moved on to the compact method.*

Once the children are secure with multiplying whole numbers (up to 4 digits by two-digits) move on to decimal numbers.

**STAGE 2: 36.23 x 3** Up to hundredths multiplied by a one-digit number

```
  3   6 • 2   3
x         3
─────────────────
  0 • 0   9       (3 x 0.03)
  0 • 6   0       (3 x 0.2)
+ 1   8 • 0   0   (3 x 6)
  9   0 • 0   0   (3 x 30)
─────────────────
1 0   8 • 6   9
    1
```

*No exchange initially.*

```
  3   6 • 2   3
x         3
─────────────────
1 0   8 • 6   9
            1
```

**Key Vocabulary:**
*double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'*