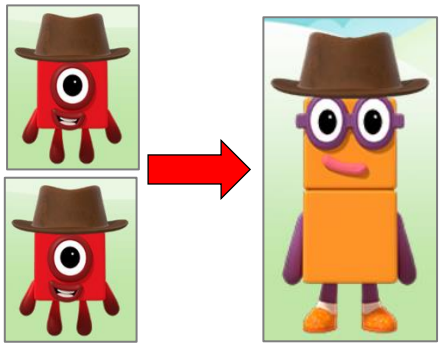
Year R

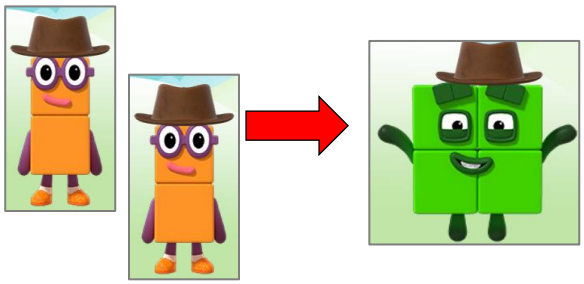
Stage 1 - Making pairs

Children build on their earlier matching skills to find and make pairs. Children begin to recognise that a pair represents 2. Children explore ranges of amounts that will have an odd one left over initiating discussions about odd and even numbers.

Stage 2 - Doubling

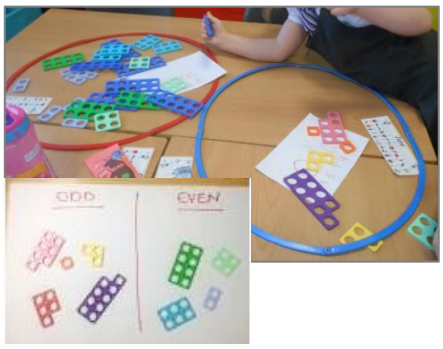
Children begin to explore key **doubling facts** within 10. '**Numberblocks'** is used to enhance children's **conceptual understanding**. Children explore how the '**Numberblocks'** characters combine a copy of themselves.





Stage 3 - Odd and even

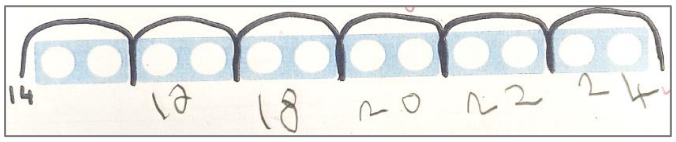
Children begin to explore odd and even numbers by looking at the shape of numbers with physical equipment. '**Numberblocks'** units are used to consolidate shapes of numbers by exploring their smooth (even) and odd block head shapes.

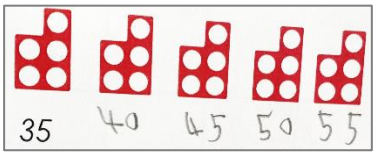


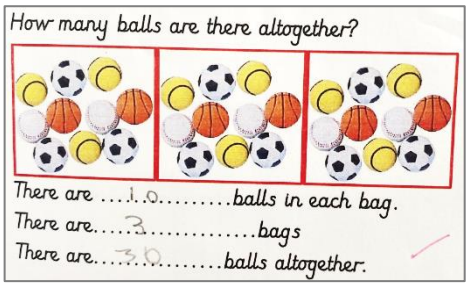
Year 1

Stage 1 – Multiplying by counting in 2s, 5s, 10s

Physical resources and pictorial resources are widely used within this stage to support children's **conceptual understanding**. **Stem sentences** are used to underpin key concepts. Patterns are represented, explored and discussed using **number squares**.

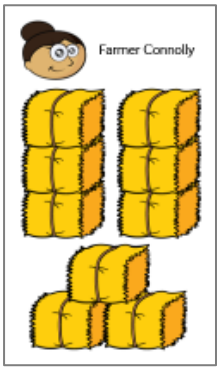


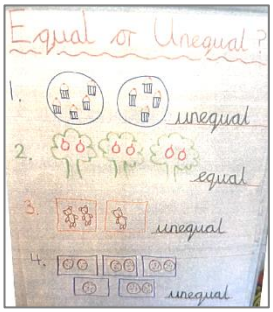


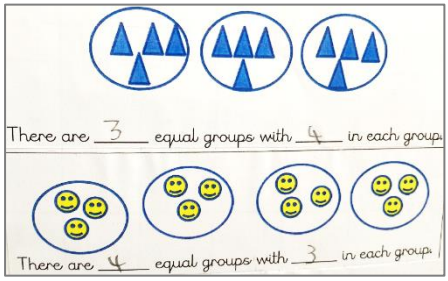


Stage 2 – Multiplication by making equal groups

Children use stories, pictures and **concrete manipulatives** to explore making equal groups and recognise when they are unequal. **Stem sentences** are used to underpin key concepts and vocabulary. Children will explore groups that look different but are the same.

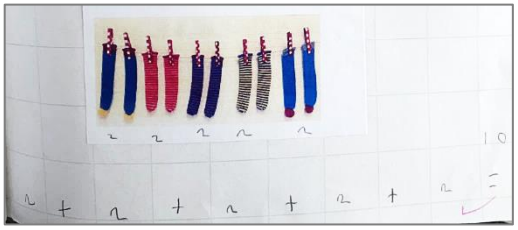


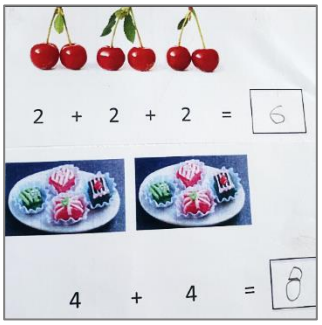




Stage 3 – Multiplication by adding equal groups

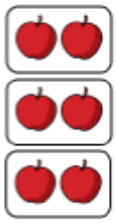
Children use equal groups to find a total. The focus is on counting equal groups of 2, 5 and 10. Children explore representing the equal groups pictorially and with repeated addition calculations.

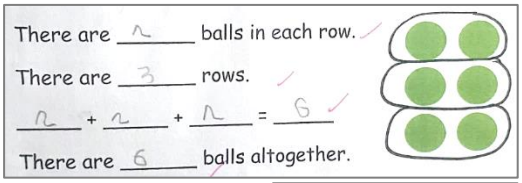




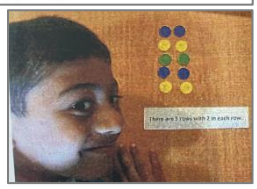
Stage 4 – Multiplication using arrays

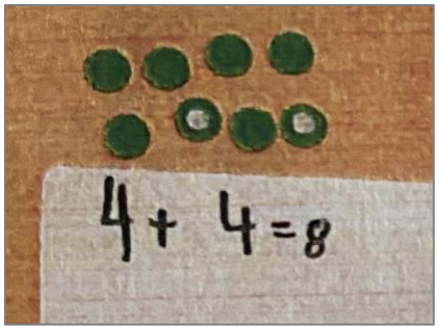
Children build **arrays** by making equal groups, representing them in columns and rows. **Stem sentences** are used to underpin key concepts and vocabulary.





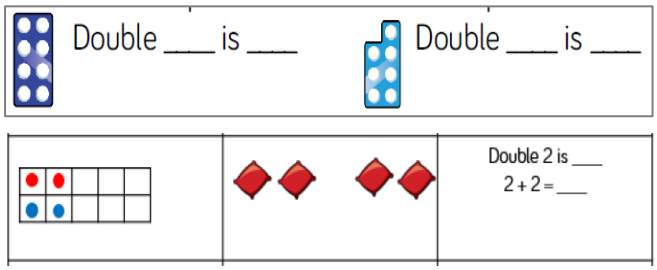
There are ____ apples in each row.
There are ____ rows.
____ + ____ + ____ = ____
There are ____ apples altogether.

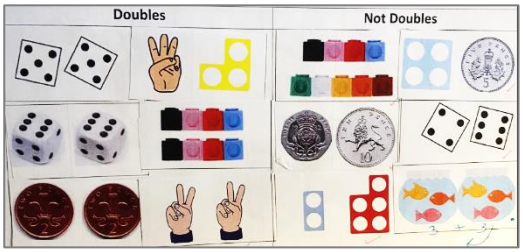




Stage 5 – Doubling

Children begin to explore key **doubling facts** within 20. Children show and explain what doubling means using **concrete** and pictorial representations. **Stem sentences** are used to aid recall.

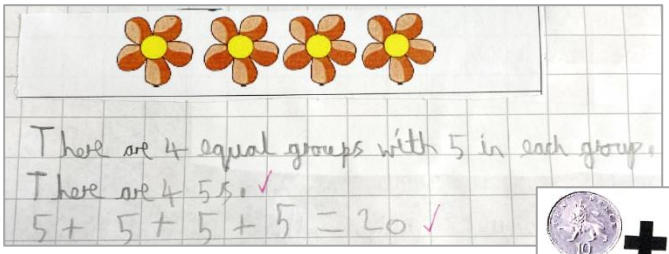




Year 2

Stage 1 – Multiplication using repeated addition

Children build on their prior learning of describing and making equal groups. The focus is on counting equal groups of 2, 5, 10 and 3. **Stem sentences** are used to underpin key concepts and vocabulary.



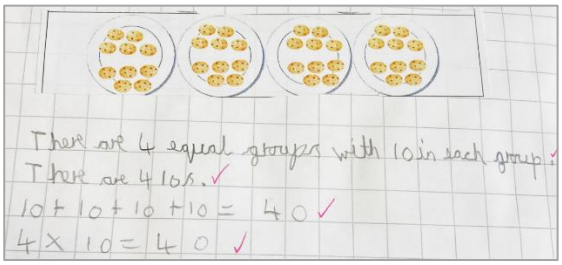
Stage 2 - Multiplication by matching equal groups

The multiplication symbol is introduced to the children for the first time. Throughout this stage, children link the **stem sentences**, repeated addition and multiplication calculations together. Within this stage, the use of **concrete resources** and pictorial representations is vital.

□ + □ + □ = 18

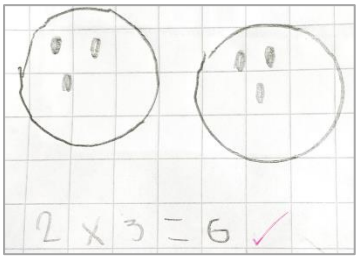
□ × □ = 18

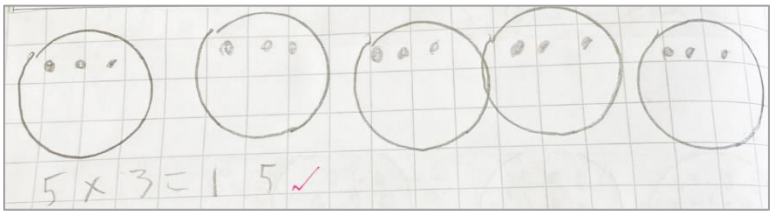
There are __ equal groups with __ in each group.
There are three __.



Stage 3 - Multiplication using jottings

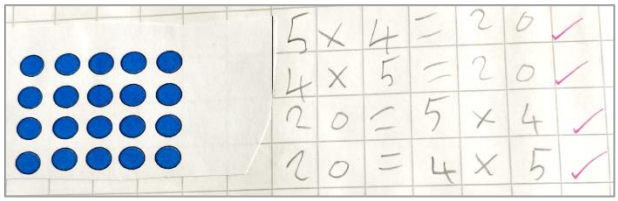
Children apply their **stem sentence**, repeated addition and multiplication knowledge to represent equal groups using pictorial 'plates' and ones jottings. The jottings mimic the **concrete resources** which are explored before this stage is introduced.

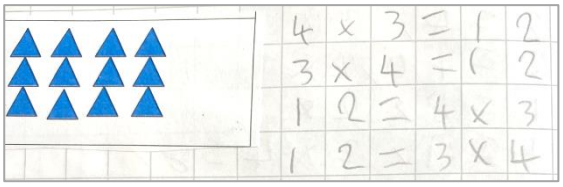




Stage 4 – Multiplication using arrays

Within this stage, children explore **arrays** to explore the **commutativity** between multiplication facts. **Arrays** are also used to assist children to answer multiplication calculations. Key '**fact family'** facts are represented and recalled through the use of **arrays**.





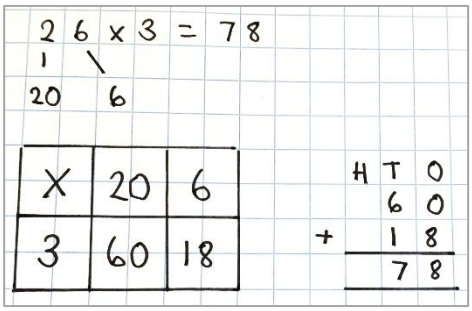
Year 3

Stage 1 - Multiplication using jottings

Children apply their **stem sentence**, repeated addition and multiplication knowledge to represent equal groups using pictorial 'plates' and tens and ones jottings. Children build on their previous knowledge to explore a greater range of times tables.

Stage 2 – Multiplication using grid method

Children use their place value knowledge to **partition** the 2-digit numbers into its tens and ones. Children then use their growing times table knowledge to calculate multiplication facts to complete the grid – this is why this is called the grid method. The amounts are then combined to calculate the total.



Year 4

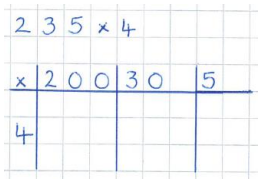
Stage 1 – Consolidation of multiplication using the grid method (multiplying 2-digits by 1-digit and 3-digits by 1-digit)

Children consolidate their understanding of the grid method.

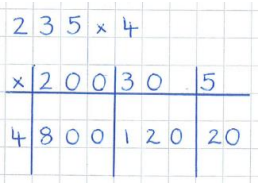
Step 1: They use their place value knowledge to **partition** the 2-digit numbers into its tens and ones and then 3-digit numbers into hundreds, tens and ones.

Step 2: They then use their times table knowledge as well as their understanding of multiplying by 10 and 100 to calculate multiplication facts to complete the grid.

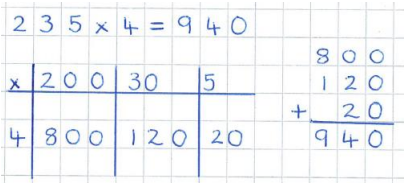
Step 3: The amounts are then combined to calculate the total.



Step 1



Step 2



Step 3

Stage 2 – Multiplication using the expanded short multiplication (multiplying 2-digits by 1-digit and 3-digits by 1-digit)

Before moving onto the formal method of compact short multiplication children use the expanded method to help them understand the value of the numbers they are using.

The expanded short multiplication method will be introduced alongside the use of grid method (the previous stage). They are put side-by-side and differences and similarities are discussed.

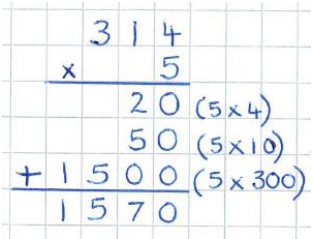
Children start by multiplying the **multiplier** by the ones in the **multiplicand**. The answer is written below the line.

They then multiply the **multiplier** by the tens in the **multiplicand** and write the answer below their previous answer.

Finally, they add the two answers together, using column addition.

When children are more secure with this method, they move onto multiplying 3-digits by 1-digit.

```
    2 3
x     4
  ------
    1 2   (4 x 3)
+   8 0   (4 x 20)
  ------
    9 2
```

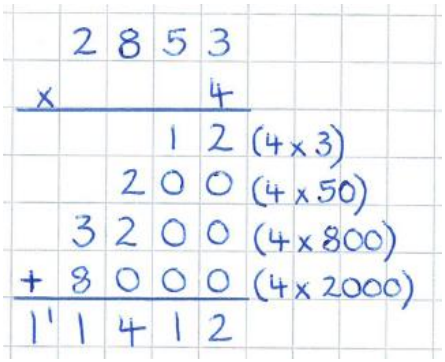


Year 5

Stage 1 – Consolidation of short multiplication using the expanded method (multiplying up to and including 4-digits by 1-digit)

Children consolidate their understanding of the expanded short multiplication method.

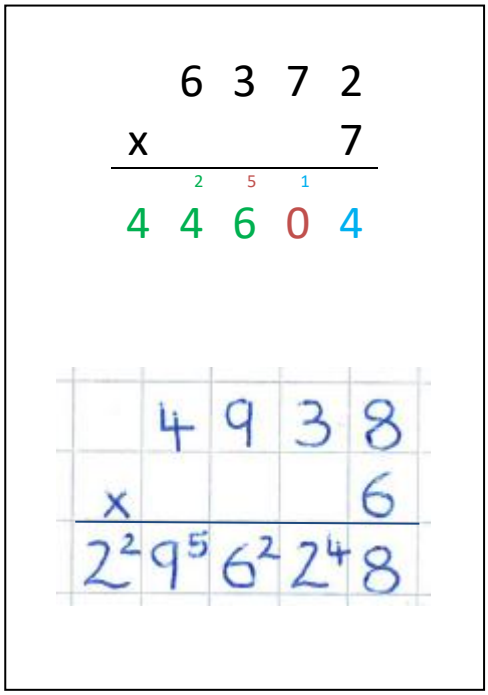
Step 1: They start by multiplying the **multiplier** by the ones in the **multiplicand**. The answer is written below the line.
Step 2: They then multiply the **multiplier** by the tens in the **multiplicand** and write the answer below their previous answer.
Step 3: Finally, they add the four answers together, using column addition.



Stage 2 – Multiplication using the compact short multiplication method (multiplying up to and including 4-digits by 1-digit)

The compact short multiplication method will be introduced alongside the use of expanded short multiplication (the previous stage), to aid understanding. They are put side-by-side and differences and similarities are discussed.

Children start by multiplying the **multiplier** by the ones in the **multiplicand**. The ones digit in the answer is placed under the line, in the ones column, and any tens are carried over to the tens column ready for regrouping.
They then multiply the **multiplier** by the tens in the **multiplicand**. They add any tens from the previous calculation and carry any hundreds over to the next column.
Continue this process until all the parts of the **multiplicand** have been multiplied by the **multiplier**.



Stage 3 – Multiplication using the grid method to multiply 2-digits by 2-digits

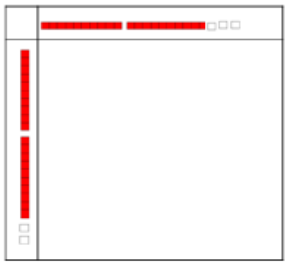
Children return to the grid method that they were familiar with in Year 4, but this time look at multiplying 2-digits by 2-digits. **Base 10** and **place value counters** should be used to support understanding.

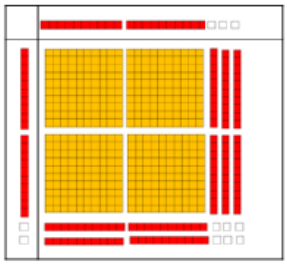
Step 1: They use their place value knowledge to **partition** both the 2-digit numbers into its tens and ones.

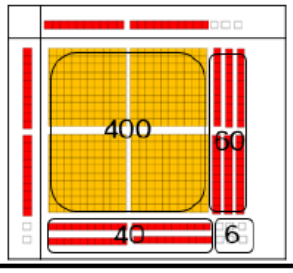
Step 2: They then use their times table knowledge as well as their understanding of multiplying by 10 to calculate multiplication facts to complete the grid.

Step 3: The amounts are then combined to calculate the total.

Step 1 – build the length and the width using the multiplication calculation	Step 2 – Multiply the length by the width	Step 3 –Find the total of your area
23 × 22 =	23 × 22 =	23 × 22 =

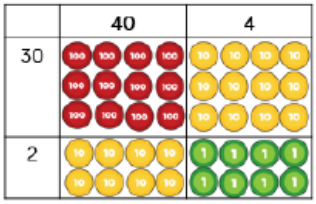






Step 1 – build the length and the width using the multiplication calculation	Step 2 – Multiply the length by the width	Step 3 –Find the total of your area
44 × 32 =	44 × 32 =	44 × 32 =

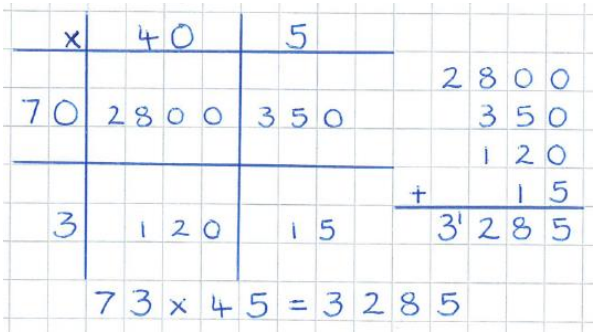
	40	4
30		
2		



	40	4
30	1200	120
2	80	8

	40	4
30	1200	120
2	80	8

1200
120
+ 80
8
1400

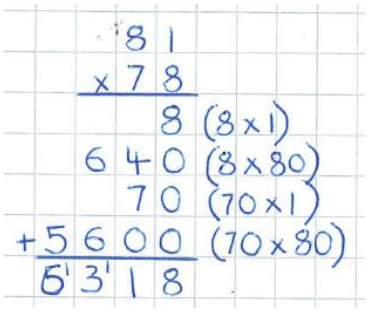


Stage 4 – Multiplication using expanded long multiplication (multiplying 2-digits by 2-digits)

Before moving onto the formal method of long multiplication children use the expanded method to help them understand the value of the numbers they are using.

The expanded long multiplication method will be introduced alongside the use of grid method (the previous stage). They are put side-by-side and differences and similarities are discussed.

```
        9 4
      X 6 3
      -----
        1 2   (3 x 4)
      1 8 0   (3 x 90)
      2 4 0   (60 x 4)
  +   5 4 0 0 (60 x 90)
      -------
      1
    5 8 3 2
```



Children start by multiplying the ones digit in the **multiplier** by the ones in the **multiplicand**. The answer is written below the line.

They then multiply the ones digit in the **multiplier** by the tens in the **multiplicand** and write the answer below their previous answer.

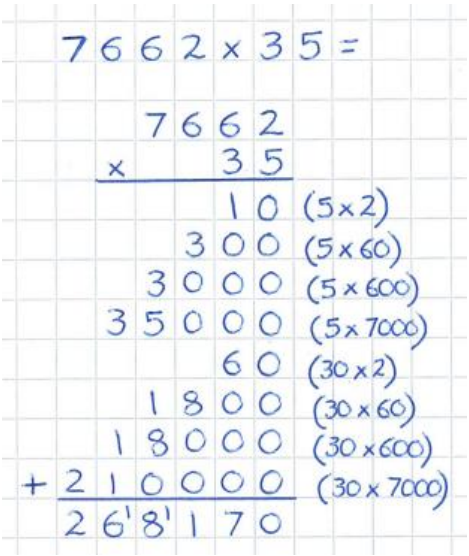
After, they repeat the process but this time multiplying the tens in the **multiplier** by the ones and then tens in the **multiplicand**. Each answer is written below the previous answer.

Finally, they add the four answers together, using column addition.

Stage 5 – Multiplication using expanded long multiplication (multiplying 2-digits by 3-digits and 4-digits)

Once children are secure with multiplying 2-digits by 2-digits using the expanded long multiplication method, they move onto multiplying 2-digits by 3-digits and then 4-digits.

They follow the same process as in the previous stage, but they make sure they have multiplied the ones and tens from the **multiplier** by the all parts of the **multiplicand**.



Year 6

Stage 1 - Multiplication using the compact long multiplication method (multiplying up to and including 4-digits by 2-digit)

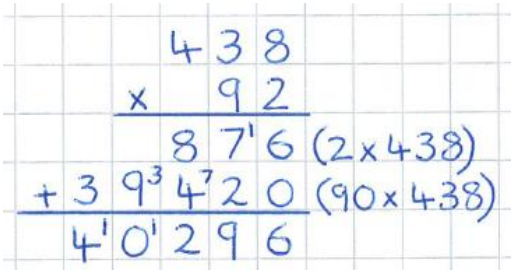
The compact long multiplication method will be introduced alongside the use of expanded long multiplication (from Year 5), to aid understanding. They are put side-by-side and differences and similarities are discussed.
Some children start with multiplying 2-digits by 2-digits, whereas others will start with multiplying 3-digits by 2-digits.

Children start by multiplying the ones in the **multiplier** by the ones in the **multiplicand**. The ones digit in the answer is placed under the line, in the ones column, and any tens are carried over to the tens column ready for regrouping.
They then multiply the ones in the **multiplier** by the tens in the **multiplicand**. They add any tens from the previous calculation and carry any hundreds over to the next column.
Continue this process until all the parts of the **multiplicand** have been multiplied by the **multiplier**.

```
      6 2
    x 3 7
    ------
    4 1
    4 3 4   (7 x 62)
  1
+ 1 8 6 0   (30 x 62)
  ------
  1
  2 2 9 4
```

Before starting the next part of the calculation, children place a zero **place holder** in the ones column underneath the answers within the previous part. This is because they are about to multiply by a tens number and therefore there will be 0 ones.
They will then multiply each part of the **multiplicand** by the tens in the **multiplier**.
Column addition is then used to add the two numbers together to find the final answer.

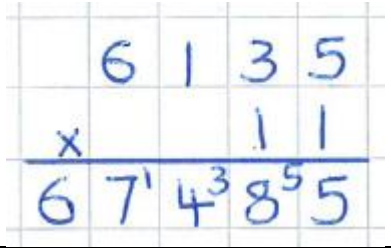
When children are confident, they will multiply up to and including 4-digits by 2-digits.

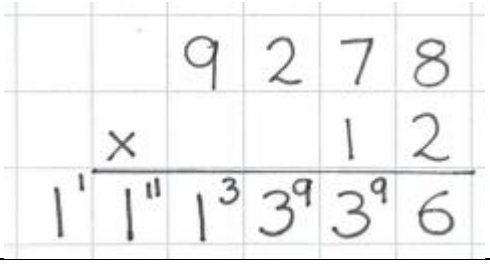


Stage 2 – Further consolidation of the compact short multiplication method (multiplying 4-digits by 11 and 12)

Children use the compact method for short multiplication to multiply 4-digits by 11 and 12.

Instead of multiplying the ones and the tens of the multiplier by each part of the multiplicand, children multiply by 11 / 12 in one calculation (as this is in their times table knowledge).

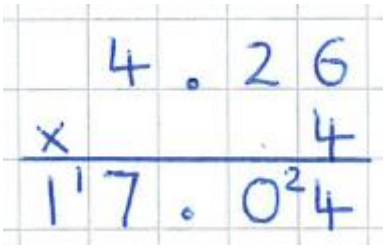


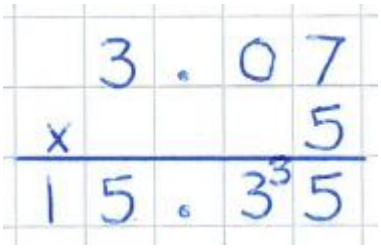


Stage 3 – Multiplication of decimals using the compact short multiplication method (multiplying 1-digit numbers with up to 2 decimal places by whole numbers)

As part of the learning on decimals, children apply their knowledge of the compact method for short multiplication to multiplying numbers which include decimals.

Children need to make sure that they remember to bring down the decimal point and to estimate their answer to ensure a sensible one.





Some children may need to go back to the expanded method for short multiplication or use **place value counters** to support understanding.