
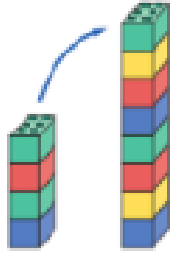

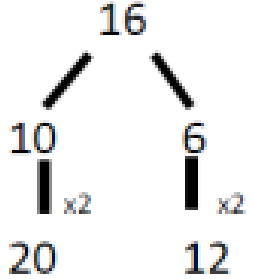
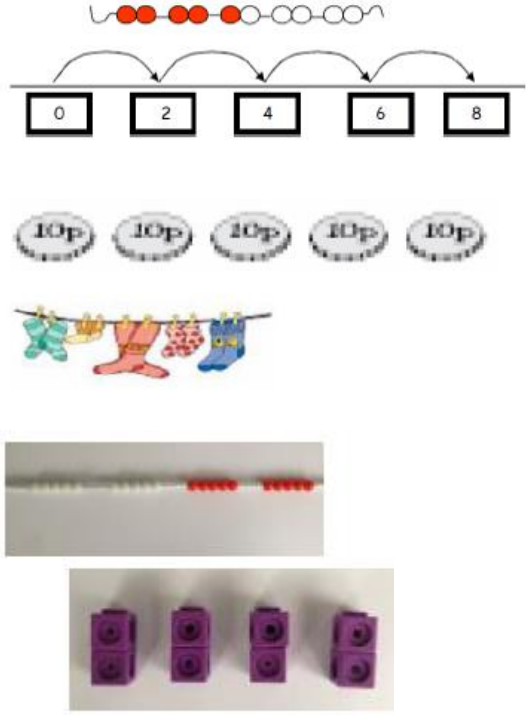
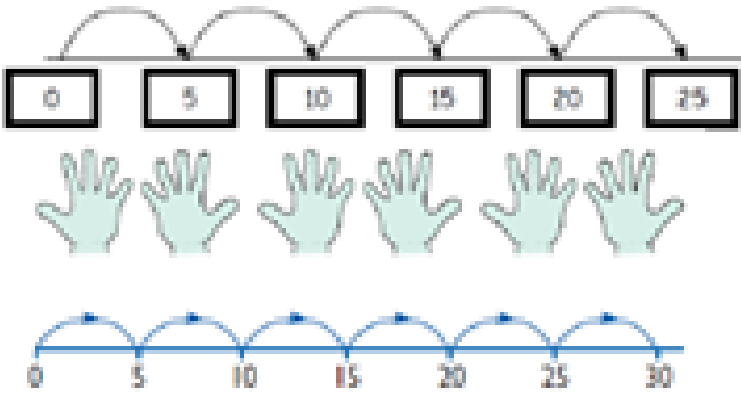


MULTIPLICATION STAGE 1

Progression	Concrete	Pictorial	Abstract
<p>Understand the language of doubling.</p>	 <p>Use objects to understand what doubling means – e.g. counting the spots on both sides of a ladybird.</p>		
<p>Doubles</p> <p>Year 1 – doubles to 10.</p> <p>Year 2 – doubles to 20.</p>	<p>Use practical activities to show how to double a number.</p>  <p>double 4 is 8 $4 \times 2 = 8$</p> <p>Before showing the multiplication sign use the word lots of, when confident with doubling introduce the concept that doubling is the same as multiplying by 2.</p>	<p>Draw pictures to show how to double a number.</p> <p>Double 4 is 8</p> 	 <p>Partition a number and then double each part before recombining it back together.</p>
<p>Counting in multiples. (Count in repeated groups of the same size).</p> <p>Foundation Stage: 1s, 2s and 10s.</p> <p>Year 1: 1s, 2s, 3s, 5s and 10s.</p> <p>Year 2: 1s, 2s, 3s, 4s, 5s and 10s.</p>	 <p>Count in multiples supported by concrete objects in equal groups.</p>	 <p>Use a number line or pictures to continue support in counting in multiples.</p>	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers:</p> <p>2,4,6,8,10</p> <p>5,10,15,20,25,30</p>

Underlying skills

- Count objects accurately using one to one correspondence matching a number name to each object.
- Number recognition 0-20.
- Count up to 20.
- Count in 2s, 5s and 10s as appropriate.
- Place value – order numbers 0-20 in size.
- Number bonds to 10.

Active Learning Through Models and Images

MULTIPLICATION STAGE 2

Progression

The x sign as repeated addition and lots of.

Concrete

Pictorial

There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?

Abstract

Write addition sentences to describe objects and pictures.

Arrays – showing commutative multiplication.

Create arrays using counters/ cubes to show multiplication sentences.

Draw arrays in different rotations to find **commutative** multiplication sentences.

Link arrays to area of rectangles.

Use an array to write multiplication sentences and reinforce repeated addition.

$5 + 5 + 5 = 15$
 $3 + 3 + 3 + 3 + 3 = 15$
 $5 \times 3 = 15$
 $3 \times 5 = 15$

Underlying skills

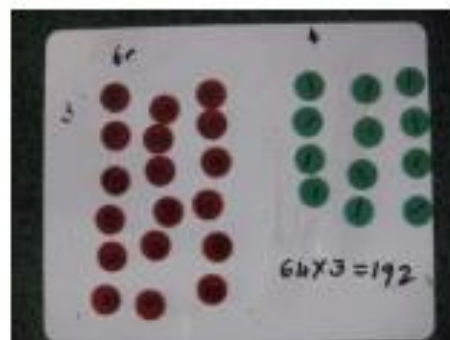
- Count forwards in steps of different single digit numbers accurately.
- Understand multiplication as repeated addition.

Active Learning Through Models and Images

MULTIPLICATION STAGE 3			
<u>Progression</u>	Concrete	Pictorial	Abstract

Use partitioning to multiply larger numbers.

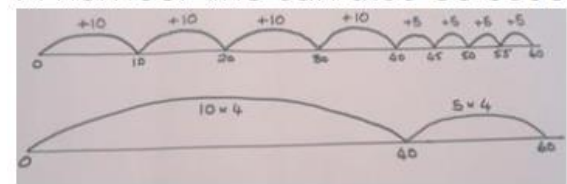
Children can continue to be supported by place value counters at the stage of multiplication.



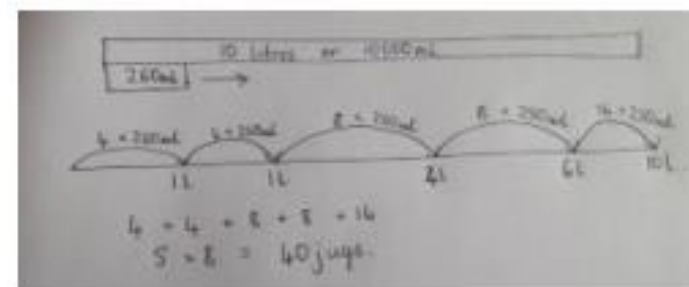
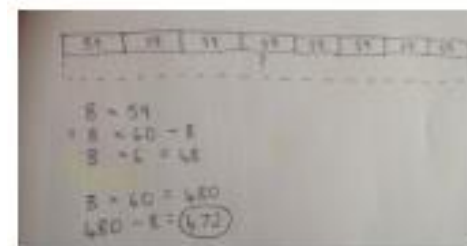
It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Use of a number line to solve 15×4 :

A number line can also be used



Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.



$64 \times 3 =$
 $60 \times 3 = 180$
 $4 \times 3 = 12$
 $180 + 12 = 192$

Underlying skills

- Partition numbers appropriately.
- Recall appropriate multiplication facts.
- Multiply numbers by 10, 100, 1000.
- Multiply

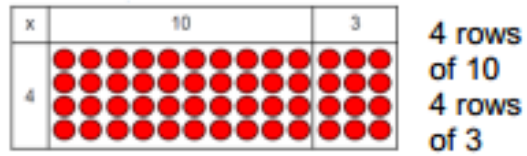
$56 = 50 + 6$
 $27 = 20 + 7$
 $5 \times 2 = 10$
 $50 \times 2 = 100$
 $5 \times 20 = 100$
 $50 \times 20 = 1000$
 $6 \times 1 = 6$
 $6 \times 10 = 60$
 $6 \times 100 = 600$
 $6 \times 1000 = 6000$

$6 \times 1 = 6$ $6 \times 10 = 60$ $6 \times 100 = 600$
 $6 \times 2 = 12$ $6 \times 20 = 120$ $6 \times 200 = 1200$
 $6 \times 3 = 18$ $6 \times 30 = 180$ $6 \times 300 = 1800$

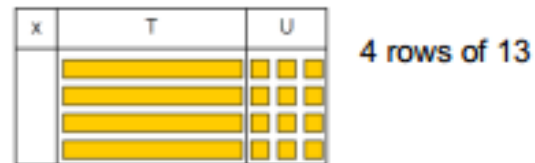
<p>multiples of 10.</p> <ul style="list-style-type: none"> Add together 2, 3, or 4 digit numbers. 	<p> $6 \times 4 = 24$ $6 \times 40 = 240$ $6 \times 400 = 2400$ $1350 + 162$ $1000 + 300 + 50 = 1350$ $100 + 60 + 2 = 162$ $1000 + 400 + 110 + 2 = 1512$ </p>		
MULTIPLICATION STAGE 4			
<u>Progression</u>	Concrete	Pictorial	Abstract

Use the grid method to multiply bigger numbers.

Show the link with arrays to first introduce the grid method.



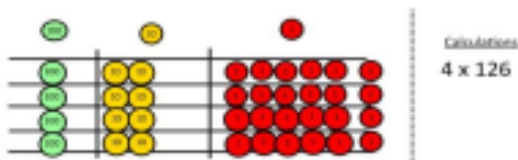
Move on to using Base 10 to move towards a more compact method.



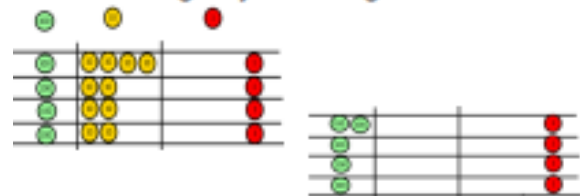
Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.



Fill each row with 126.



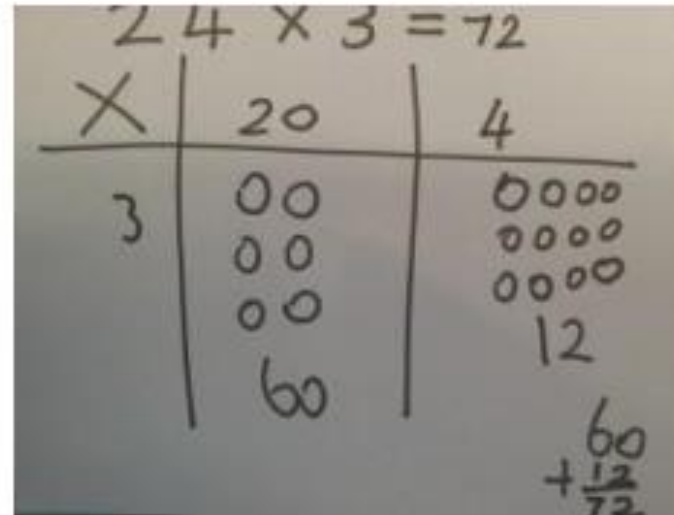
Add up each column, starting with the ones making any exchanges needed.



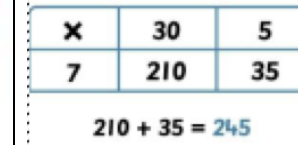
Then you have your answer.

Children can represent the work they have done with place value counters in a way that they understand.

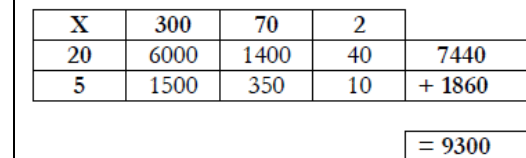
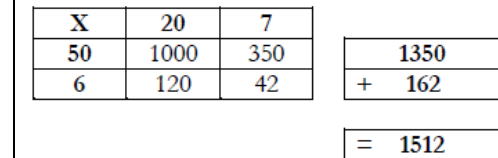
They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.



Start with multiplying by one digit numbers and showing the clear addition alongside the grid:



Moving forward, multiply by a 2 digit number showing the different rows within the grid method:



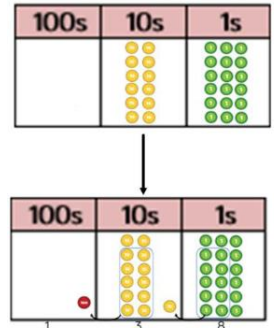
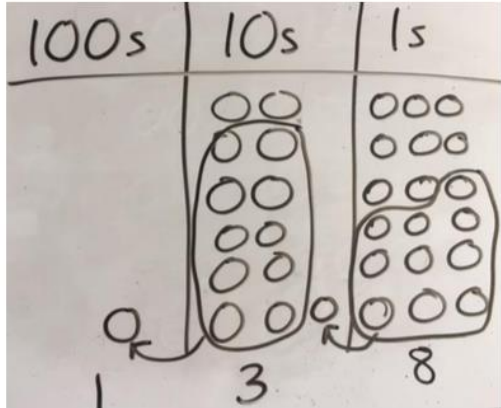
Underlying skills

- Partition numbers appropriately.
- Recall appropriate

$56 = 50 + 6$
 $27 = 20 + 7$
 $5 \times 2 = 10$
 $50 \times 2 = 100$
 $5 \times 20 = 100$

<p>multiplication facts.</p> <ul style="list-style-type: none"> Multiply numbers by 10, 100, 1000. Multiply multiples of 10. <p>Add together 2, 3, or 4 digit numbers.</p>	<p>$50 \times 20 = 1000$</p> <p>$6 \times 1 = 6$ $6 \times 10 = 60$ $6 \times 100 = 600$ $6 \times 1000 = 6000$</p> <p>$6 \times 1 = 6$ $6 \times 10 = 60$ $6 \times 100 = 600$ $6 \times 2 = 12$ $6 \times 20 = 120$ $6 \times 200 = 1200$ $6 \times 3 = 18$ $6 \times 30 = 180$ $6 \times 300 = 1800$ $6 \times 4 = 24$ $6 \times 40 = 240$ $6 \times 400 = 2400$</p> <p>$1350 + 162$</p> <p>$1000 + 300 + 50 = 1350$ $100 + 60 + 2 = 162$ $1000 + 400 + 110 + 2 = 1512$</p>
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MULTIPLICATION STAGE 5

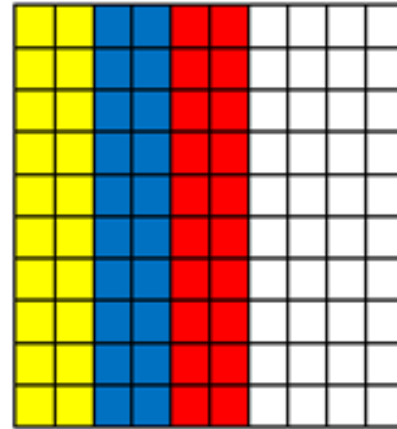
Progression	Concrete	Pictorial	Abstract
<p>Formal column multiplication for whole number times single digit number.</p> <p>Start with no exchanging before moving on to exchanging.</p>	<p>Formal column method with place value counters.</p> <p>6×23</p> 	<p>Children to represent the counters/base 10, pictorially e.g. the image below.</p> 	<p>Children must be taught to line up columns.</p> $\begin{array}{r} 23 \\ \times 6 \\ \hline 18 \text{ (3x6)} \\ 120 \text{ (20 x 6)} \\ \hline 138 \end{array}$ <p>Move on to compact formal written method below:</p> $6 \times 23 =$ $\begin{array}{r} 23 \\ \times 6 \\ \hline 138 \\ \hline 11 \end{array}$
<p>To move on to 3d and 4d x 1d they should be confident with the compact formal written method above.</p>			
<p>Formal column multiplication for decimals X single digit number.</p> <p>Start with no exchanging</p>	<p>Sam, Tara and Emily have £16.20 each. How much do they have altogether?</p> <p>Calculation = $£16.20 \times 3$</p>	<p>Sam has 8 pieces of ribbon that measure 34.2cm each. How much ribbon does he have altogether?</p>	<p>16.2×3</p> $\begin{array}{r} 16.2 \\ \times 3 \\ \hline 0.6 \text{ (0.2 x 3)} \\ 18.0 \text{ (6 x 3)} \end{array}$

before moving on to exchanging.



$$\begin{aligned} \text{£}10 \times 3 &= \text{£}30 \\ \text{£}5 \times 3 &= \text{£}15 \\ \text{£}1 \times 3 &= \text{£}3 \\ \text{£}0.20 \times 3 &= \text{£}0.60 \end{aligned}$$

$$\text{£}30 + \text{£}15 + \text{£}3 + \text{£}0.60 = \text{£}48.60$$



Shaded in above is 3 groups of 0.2 (0.2 is the same as 20 out of 100)

0.6 of the whole is shaded (0.6 is the same as 60 out of 100)

X	30	4	0.2
8	240	32	1.6

$$240 + 32 + 1.6 = 273.6$$

$$30.0 (10 \times 3)$$

$$48.6$$

Moving on to compact formal written method below:

$$16.2$$

$$\begin{array}{r} 16.2 \\ \times 3 \\ \hline \end{array}$$

$$48.6$$

1

Underlying Skills

- partition numbers appropriately
- recall appropriate multiplication facts up to and including 12 x 12
- multiply numbers by 10,100 and 1000
- multiply multiples of 10,100 and 1000
- add together 2, 3 or 4 digit numbers
- Multiply

$$\begin{aligned} 56 &= 50 + 6 \\ 27 &= 20 + 7 \end{aligned}$$

$$\begin{aligned} 6 \times 1 &= 6 \\ 6 \times 10 &= 60 \\ 6 \times 100 &= 600 \\ 6 \times 1000 &= 6000 \end{aligned}$$

$$\begin{array}{lll} 6 \times 1 = 6 & 6 \times 10 = 60 & 6 \times 100 = 600 \\ 6 \times 2 = 12 & 6 \times 20 = 120 & 6 \times 200 = 1200 \\ 6 \times 3 = 18 & 6 \times 30 = 180 & 6 \times 300 = 1800 \\ 6 \times 4 = 24 & 6 \times 40 = 240 & 6 \times 400 = 2400 \end{array}$$

$$1350 + 162$$

$$1000 + 300 + 50 = 1350$$

decimals
understanding
place value.

$$100 + 60 + 2 = 162$$

$$1000 + 400 + 110 + 2 = 1512$$

$$0.8 \times 0.3 = 0.24$$

$$8 \times 0.3 = 2.4$$

$$0.8 \times 3 = 2.4$$

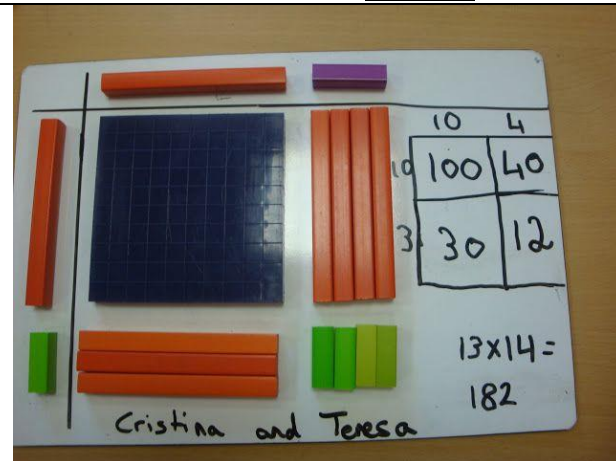
MULTIPLICATION STAGE 6

Progression

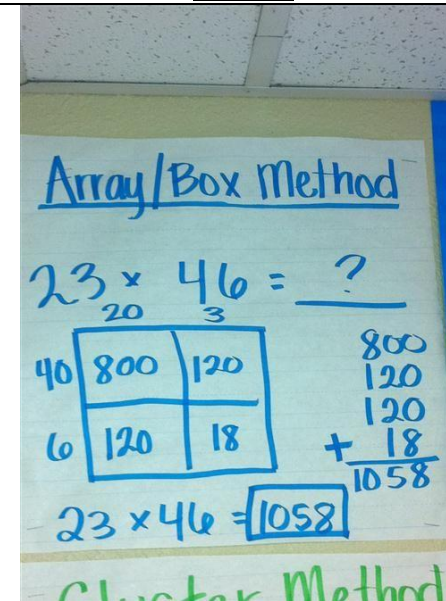
Formal column method
for long multiplication
up to 4d x 2d

Start with no exchanging
and multiplying by a
teen number before
moving on to
exchanging and then
larger 2 digit numbers.

Concrete



Pictorial



Abstract

Start with the long multiplication, reminding the children about lining up their numbers clearly in columns.

If it helps, children can write out what they are solving next to their answer.

$$\begin{array}{r}
 32 \\
 \times 24 \\
 \hline
 8 \quad (2 \times 4) \\
 120 \quad (30 \times 4) \\
 40 \quad (2 \times 20) \\
 \hline
 600 \quad (30 \times 20) \\
 768
 \end{array}$$

This moves to the more compact method:

$$\begin{array}{r}
 1342 \\
 \times 18 \\
 \hline
 10736 \\
 \hline
 26840 \\
 \hline
 24156 \\
 \hline
 1
 \end{array}$$

(Ensure they cross as they add the digit on)

When multiplying by a 2 digit number that is not a teen number e.g. x 28, for the second line the children can split the 20 into 2 x 10 and do a jotting on the side.

$$\begin{array}{r}
 1342 \\
 \times 18 \\
 \hline
 10736 \\
 \hline
 26840 \\
 \hline
 24156 \\
 \hline
 1
 \end{array}$$

(Ensure they cross as they add the digit on)

			$1342 \times 20 = 1342 \times 2 \times 10$ $1342 \times 2 = 2684 \times 10 = 26840$
<p><u>Underlying Skills</u></p> <ul style="list-style-type: none"> • Use facts up to 12x12 to derive facts involving multiples 10/100. • Recall appropriate multiplication facts. • Multiply numbers by 10,100,100. • Multiply and divide multiples of 10. • Add together 2, 3 or 4 digit numbers. 	$8 \times 3 = 24$ $80 \times 3 = 240$ $8 \times 30 = 240$ $80 \times 30 = 2400$		