

Multiplication and Division

Year 4

The Distributive Property of Multiplication

Vocabulary:

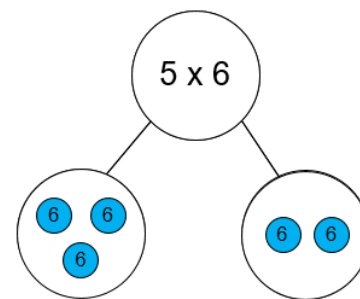
Multiplication Distributive Law Adjacent Multiples Factors Partitioning
Equations Expressions Arrays Part-whole model Difference

$0 \times 6 = 0$	$6 \times 0 = 0$
$1 \times 6 = 6$	$6 \times 1 = 6$
$2 \times 6 = 12$	$6 \times 2 = 12$
$3 \times 6 = 18$	$6 \times 3 = 18$
$4 \times 6 = 24$	$6 \times 4 = 24$
$5 \times 6 = 30$	$6 \times 5 = 30$
$6 \times 6 = 36$	$6 \times 6 = 36$
$7 \times 6 = 42$	$6 \times 7 = 42$
$8 \times 6 = 48$	$6 \times 8 = 48$
$9 \times 6 = 54$	$6 \times 9 = 54$
$10 \times 6 = 60$	$6 \times 10 = 60$
$11 \times 6 = 66$	$6 \times 11 = 66$
$12 \times 6 = 72$	$6 \times 12 = 72$

$\times$	1	2	3	4	5	6
1	●	●	●	●	●	●
2	●	●	●	●	●	●
3	●	●	●	●	●	●
4	●	●	●	●	●	●
5	●	●	●	●	●	●

$$4 \times 6 + 6$$

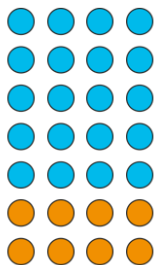
Five sixes is one more six than four sixes.



$$3 \times 6 + 2 \times 6 = 5 \times 6$$

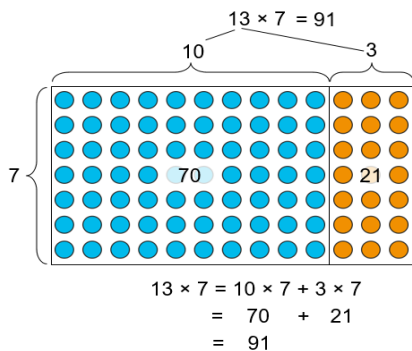
5 is equal to 3 plus 2, so 5 sixes is equal to 3 sixes plus 2 sixes.

Adjacent multiples of ____ have a difference of ____.

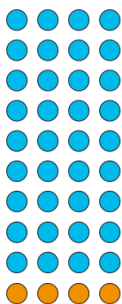


$$\begin{aligned} 7 &= 5 + 2 \\ 7 \times 4 &= 5 \times 4 + 2 \times 4 \\ &= 20 + 8 \\ &= 28 \end{aligned}$$

We can partition one of the factors to make calculations easier.

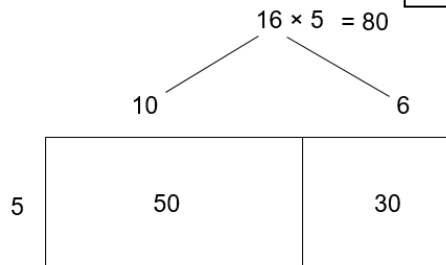


$$\begin{aligned} 13 \times 7 &= 10 \times 7 + 3 \times 7 \\ &= 70 + 21 \\ &= 91 \end{aligned}$$

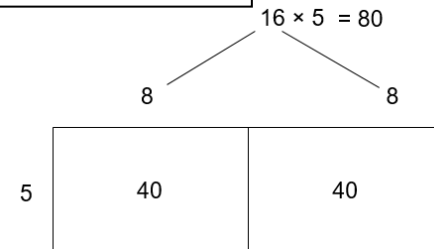


$$\begin{aligned} 9 &= 10 - 1 \\ 9 \times 4 &= 10 \times 4 - 1 \times 4 \\ &= 40 - 4 \\ &= 36 \end{aligned}$$

We can partition the factors in different ways to make calculations easier.



$$\begin{aligned} 16 \times 5 &= 10 \times 5 + 6 \times 5 \\ &= 50 + 30 \\ &= 80 \end{aligned}$$



$$\begin{aligned} 16 \times 5 &= 8 \times 5 + 8 \times 5 \\ &= 40 + 40 \\ &= 80 \end{aligned}$$

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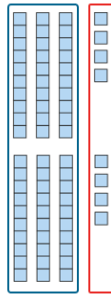
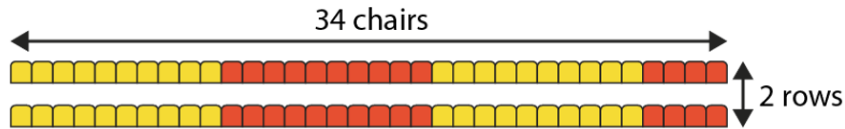
Year 5

Multiply using a Formal Written Method (1)

Vocabulary:

Ones Tens Hundreds Thousands Represents Partition Recombine
 Multiply Unitising Partial Product Aligned Calculation Expanded layout
 Compact layout Equation Regroup Algorithm

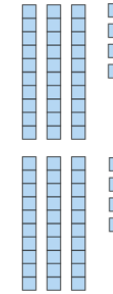
Factor x Factor = Product



$$34 = 30 + 4$$

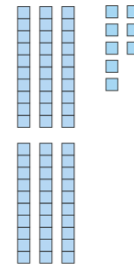
$$34 \times 2 = 30 \times 2 + 4 \times 2$$

Move between representations of
dienes and expanded written
multiplication.



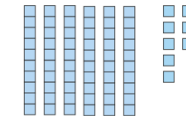
10s	1s
3	4
×	
	2

Use dienes to
represent context as
repeated addition and
move to multiplication.



10s	1s
3	4
×	
	2
	8

$2 \times 4 \text{ ones} = 8 \text{ ones}$



10s	1s
3	4
×	
	2
	8
6	0

$2 \times 4 \text{ ones} = 8 \text{ ones}$

$2 \times 3 \text{ tens} = 6 \text{ tens}$

$321 \times 3 =$ 963

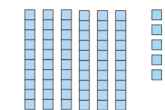
100s	10s	1s
3	2	1
×		
		3
	6	0
9	0	0
9	6	3

3 2 1
× 3
9 6 3

Represent 3 digit
multiplication without exchanges using
dienes, moving from expanded layout
to compact layout.

10s	1s
3	4
×	
	2
6	8

Move between representations of
expanded layout and compact
layout.



10s	1s
3	4
×	
	2
	8
6	0
6	8

$2 \times 4 \text{ ones} = 8 \text{ ones}$

$2 \times 3 \text{ tens} = 6 \text{ tens}$

Multiplication and Division

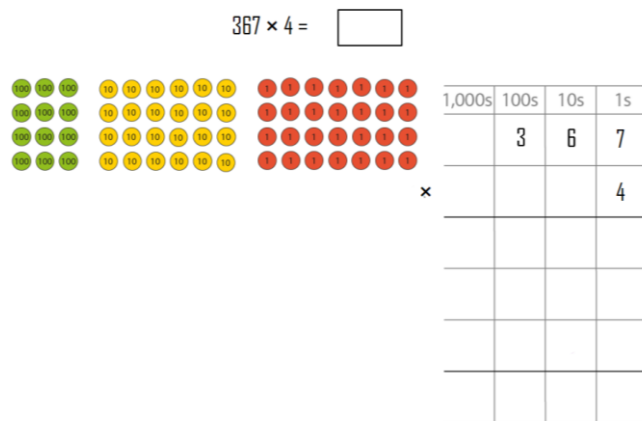
Year 5

Multiply using a Formal Written Method (2)

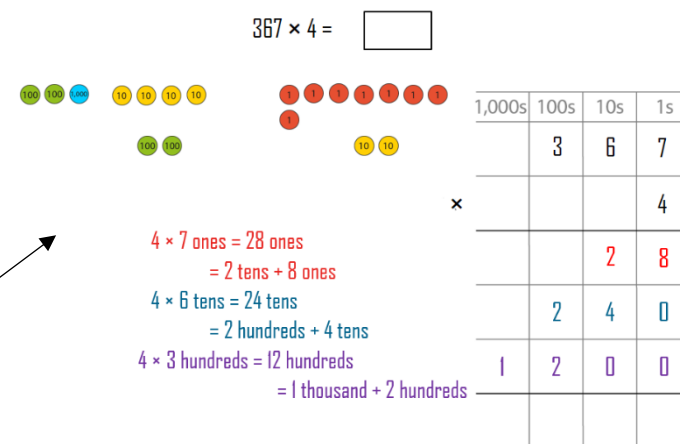
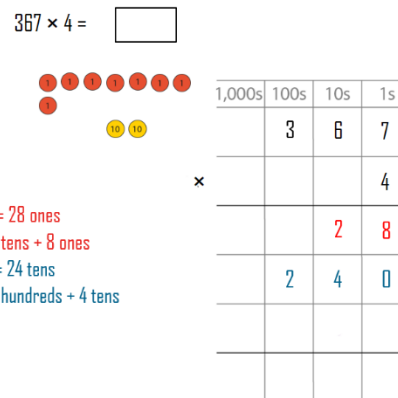
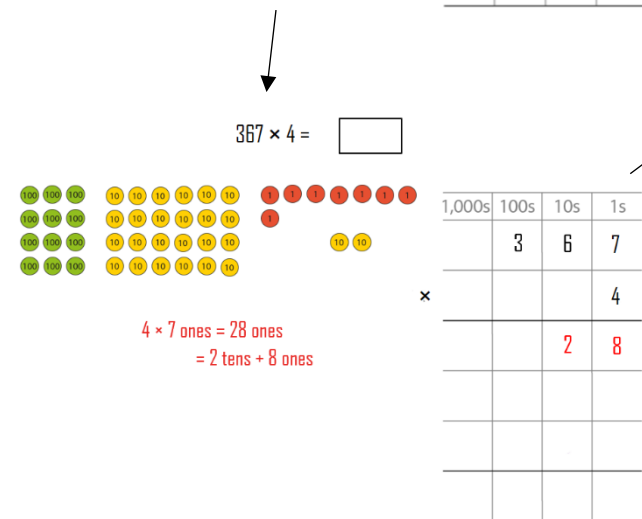
Vocabulary:

Ones Tens Hundreds Thousands Represents Partition Recombine
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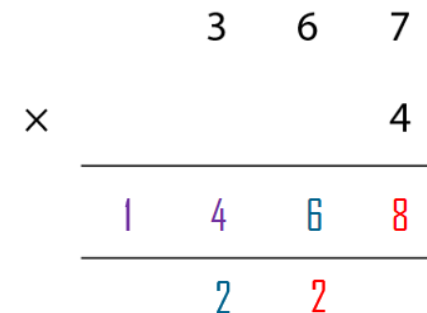
Represent 3 digit by 1 digit multiplication with exchanges using place value counters, moving from expanded layout to compact layout.



$4 \times 7 \text{ ones} = 28 \text{ ones}$
 $= 2 \text{ tens} + 8 \text{ ones}$
 $4 \times 6 \text{ tens} = 24 \text{ tens}$
 $= 2 \text{ hundreds} + 4 \text{ tens}$
 $4 \times 3 \text{ hundreds} = 12 \text{ hundreds}$
 $= 1 \text{ thousand} + 2 \text{ hundreds}$

$367 \times 4 =$

Move from expanded layout to compact layout.



If there are 10 or more ones, we must regroup ones into tens and ones.

If there are 10 or more tens, we must regroup into hundreds and tens.

If there are 10 or more hundreds, we must regroup into thousands and hundreds.