Multiplication and Division Calculation Policy

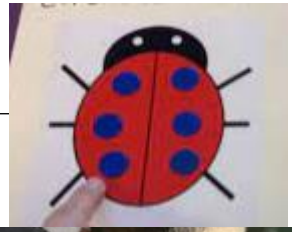
This policy has been adapted from the White Rose Scheme of Learning and the NCETM Mastery Materials. This is a working document and is subject to change and revisions.

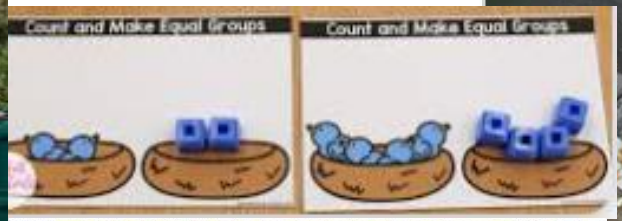
Multiplication

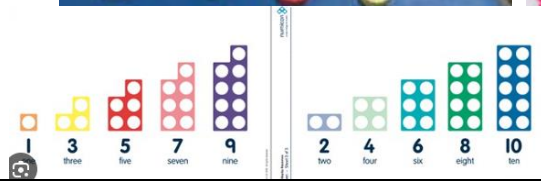
EYFS

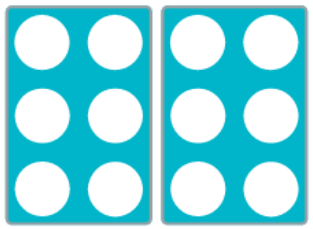
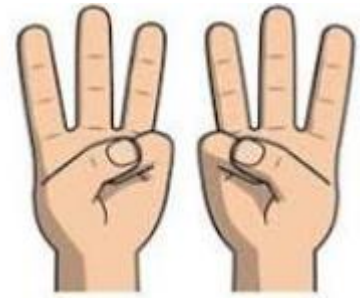
Children in the EYFS will have opportunity to see that groups could consist of equal number of things. Children can check that groups are equal by matching objects on a one to one basis.

Explore groups with the same number of things – with odd and even	Ensuring that when providing groups to compare, there are some that have an equal amount Asking children to convert two unequal groups into two that have the same number, e.g. 'There are 6 apples in one bag and 2 in another bag; can we make the bags equal for the two hungry horses?' *It is fair because… It is not fair because The _____ have been shared equal.* *The groups are unequal/equal because… know this is odd/even because… To make this I have ___ equal group of….* *I know this is even because*



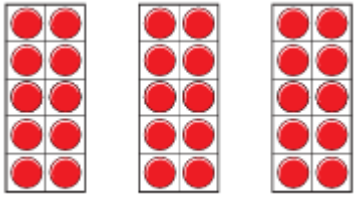
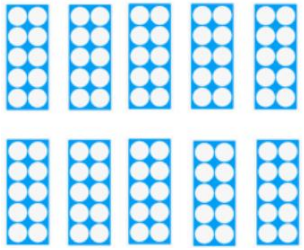
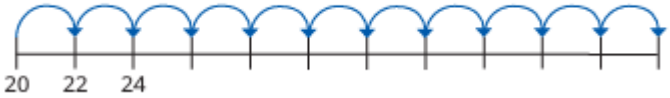
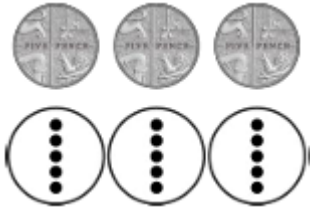
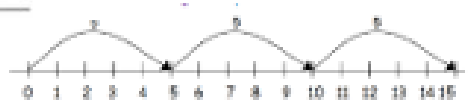


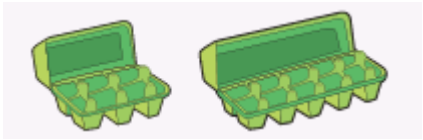
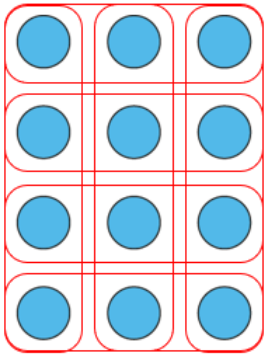
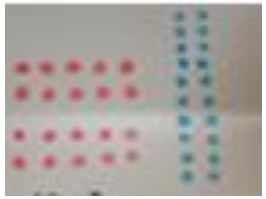
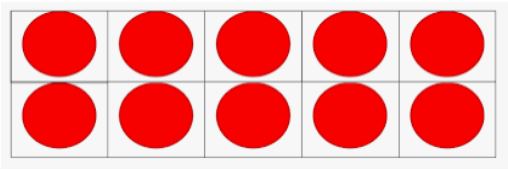
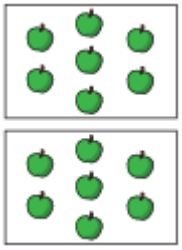
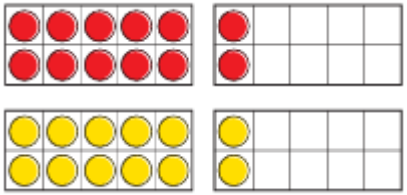
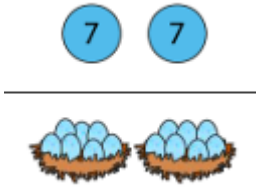


Build with doubles	*Double ____ is ____* *I can see ____ and _____* *I can see ____ altogether* *This is double ____*	     

Multiplication

Year 1

Explore the concept of unitising by counting in units of two, five or ten	Children will use a range of representations to show equal groups of two, five and ten.      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 _ 10 _ _ _ 50 4 14 _ _ _ Complete the number lines by counting in 2s.  *There are ____ in each group* *There are ____ pairs/fives/tens* *There are ____ many in total*  
Recognise and add equal groups	  There are ____ equal groups of ____ I know that the groups are equal/not equal because … To make the groups equal, I could …  There are ____ equal groups. There are ____ in each group. There are ____ altogether. There are ____ groups of ____ ____ + ____ + ____ + ____ + ____ = ____  10 + 10 + 10 = ____   5 + 5 + 5 = 15

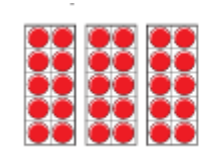
Make arrays	An effective way to introduce arrays to children is by using real-life examples such as bun trays and egg boxes that have these patterns already built in       There are _____ rows. There are _____ in a row. There are _____ in total. There are _____ columns. There are _____ in a column. There are _____ altogether.
Make doubles	Children will build on doubles from EYFS by relating the double to an addition and then onto two equal groups.    *Double ____ is _____* *____ + ____ =* *This is double* *_____ is/is not a double because* *Double ___ is two equal groups of ____*

Multiplication

Year 2

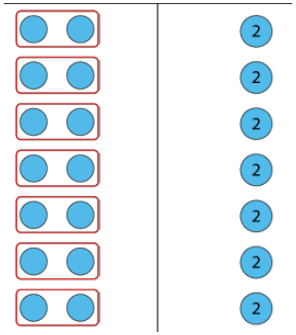
Year 2 will revist Year 1 statements of equal groups, repeated addition and making arrays before moving on. They will also explore the commutivity of multiplication. They will also explore the relationship between the five and ten times table.

Introduce the multiplication symbol



_____ + _____ + _____ = _____ × _____

Addition	Multiplication
2 + 2 + 2 + 2	4 × 2

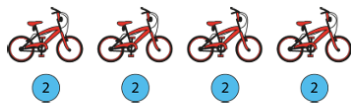


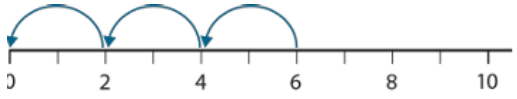
There are ___ equal groups with _____ in each group.

_____ + _____ + _____ = _____

_____ × _____ = _____

Counting in multiples of two can be represented by the two times table.





- *'Two, four, six, eight.'*
- *'There are eight wheels.'*
  $4 \times 2 = 8$ $8 = 4 \times 2$
- *'Four is a factor.'*
- *'Two is a factor.'*
- *'The product of four and two is eight.'*
- *'Eight is the product of four and two.'*

3	×	2	=	6
factor	×	factor	=	product

6	=	3	×	2
product	=	factor	×	factor

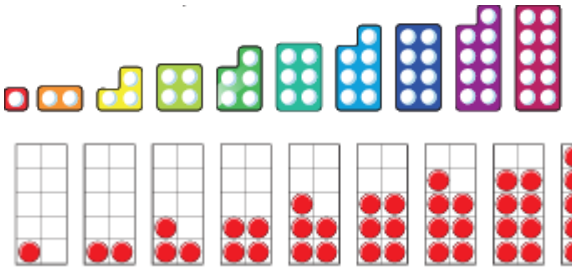
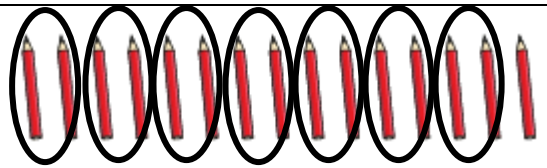
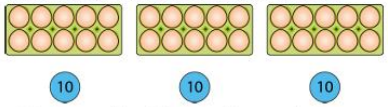
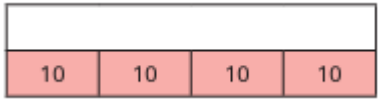
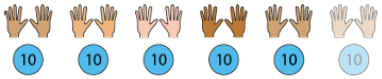
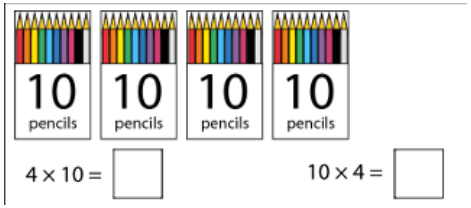
'Two, one time is equal to two,
two, two times is equal to four,
two, three times is equal to six…'
'Two times one is equal to two,
two times two is equal to four,
two times three is equal to six…'

0 × 2 = 0	2 × 0 = 0
1 × 2 = 2	2 × 1 = 2
2 × 2 = 4	2 × 2 = 4
3 × 2 = 6	2 × 3 = 6
4 × 2 = 8	2 × 4 = 8
5 × 2 = 10	2 × 5 = 10
6 × 2 = 12	2 × 6 = 12
7 × 2 = 14	2 × 7 = 14
8 × 2 = 16	2 × 8 = 16
9 × 2 = 18	2 × 9 = 18
10 × 2 = 20	2 × 10 = 20
11 × 2 = 22	2 × 11 = 22
12 × 2 = 24	2 × 12 = 24

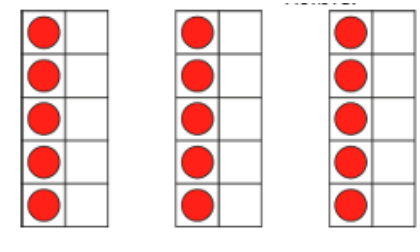
Finding adjacent multiples – ratio chart and number line:

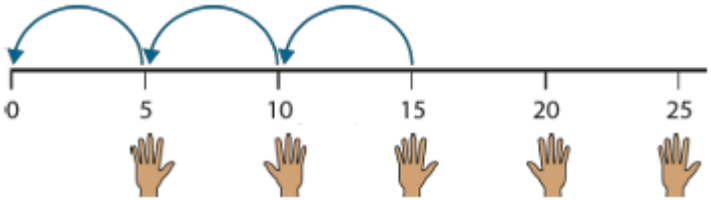
	×2	
0	0	
1	2	
2	4	
3		↓+2 3 × 2 = 2 × 2 + 2
4	8	
5	10	
6	12	
7		↑−2 7 × 2 = 8 × 2 − 2
8	16	
9	18	
10	20	
11	22	
12	24	

There are ___ groups of two.
There are ____ altogether
___ x 2 =
There are two, ____ times
2 x ____ =

Recognise Odd and Even numbers	  Even numbers have _____ in the ones column. Odd numbers have _____ in the ones column. Even numbers can be divided by _____ to give a whole number answer. The next whole number after an _____ number is an _____ number.
Counting in multiples of ten can be represented by the ten times table.	*'How many eggs are there? Count in groups of ten.'*  10 10 10 • *'Ten, twenty, thirty. There are thirty eggs.'* • *'There are three groups of ten; there are thirty altogether.'* 3 × 10 = 30 • *'Three is a factor.'* • *'Ten is a factor.'* • *'The product of three and ten is thirty.'* • *'Thirty is the product of three and ten.'*  10 10 10 10  10 10 10 10 10 10 0 × 10 = 0 | 10 × 0 = 0 1 × 10 = 10 | 10 × 1 = 10 2 × 10 = 20 | 10 × 2 = 20 3 × 10 = 30 | 10 × 3 = 30 4 × 10 = 40 | 10 × 4 = 40 5 × 10 = 50 | 10 × 5 = 50 6 × 10 = 60 | 10 × 6 = 60 7 × 10 = 70 | 10 × 7 = 70 8 × 10 = 80 | 10 × 8 = 80 9 × 10 = 90 | 10 × 9 = 90 10 × 10 = 100 | 10 × 10 = 100 11 × 10 = 110 | 10 × 11 = 110 12 × 10 = 120 | 10 × 12 = 120  10 pencils 10 pencils 10 pencils 10 pencils 4 × 10 = ☐ 10 × 4 = ☐ _____ × 10 is the same as _____ lots of 10 _____ × 10 = _____, so _____ × 10 = _____ When counting forwards in 10s, the number after _____ is _____ When counting backwards in 10s, the number after _____ is _____ • *'One group of ten is equal to ten.'* *'Two groups of ten is equal to twenty…'* • *'One times ten is equal to ten.'* *'Two times ten is equal to twenty…'* then shortening to *'One ten is ten, two tens are twenty…'* and • *'Ten, one time is equal to ten...'* *'Ten, two times is equal to twenty...'* • *'Ten times one is equal to ten...'* *'Ten times two is equal to twenty...'*

Counting in multiples of five can be represented by the five times table.





$3 \times 5 = 15$

'Three is a factor.'
'Five is a factor.'
'The product of three and five is fifteen.'
'Fifteen is the product of three and five.'

- *'One group of five is equal to five.'*
  'Two groups of five is equal to ten…'
- *'One times five is equal to five.'*
  'Two times five is equal to ten…'

and

- *'Five, one time is equal to five...'*
  'Five, two times is equal to ten...'
- *'Five times one is equal to five...'*
  'Five times two is equal to ten...'

$0 \times 5 = 0$	$5 \times 0 = 0$
$1 \times 5 = 5$	$5 \times 1 = 5$
$2 \times 5 = 10$	$5 \times 2 = 10$
$3 \times 5 = 15$	$5 \times 3 = 15$
$4 \times 5 = 20$	$5 \times 4 = 20$
$5 \times 5 = 25$	$5 \times 5 = 25$
$6 \times 5 = 30$	$5 \times 6 = 30$
$7 \times 5 = 35$	$5 \times 7 = 35$
$8 \times 5 = 40$	$5 \times 8 = 40$
$9 \times 5 = 45$	$5 \times 9 = 45$
$10 \times 5 = 50$	$5 \times 10 = 50$
$11 \times 5 = 55$	$5 \times 11 = 55$
$12 \times 5 = 60$	$5 \times 12 = 60$

'One group of five, two groups of five, three groups of five…'
'One five, two fives, three fives…'
'Five, ten, fifteen…'

Multiplying zero and one.

Two times table		Five times table		Ten times table	
$0 \times 2 = 0$	$2 \times 0 = 0$	$0 \times 5 = 0$	$5 \times 0 = 0$	$0 \times 10 = 0$	$0 \times 10 = 0$
$1 \times 2 = 2$	$2 \times 1 = 2$	$1 \times 5 = 5$	$5 \times 1 = 5$	$1 \times 10 = 10$	$1 \times 10 = 10$

The product of ____ and one is ____
The product of one and ____ is ____
The product of ____ and zero ____
The product of zero and ____ is ____

$0 \times 1 = 0$	$1 \times 0 = 0$
$1 \times 1 = 1$	$1 \times 1 = 1$
$2 \times 1 = 2$	$1 \times 2 = 2$
$3 \times 1 = 3$	$1 \times 3 = 3$
$4 \times 1 = 4$	$1 \times 4 = 4$
$5 \times 1 = 5$	$1 \times 5 = 5$
$6 \times 1 = 6$	$1 \times 6 = 6$
$7 \times 1 = 7$	$1 \times 7 = 7$
$8 \times 1 = 8$	$1 \times 8 = 8$
$9 \times 1 = 9$	$1 \times 9 = 9$
$10 \times 1 = 10$	$1 \times 10 = 10$
$11 \times 1 = 11$	$1 \times 11 = 11$
$12 \times 1 = 12$	$1 \times 12 = 12$

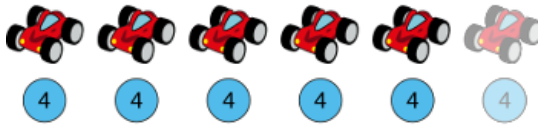
$0 \times 0 = 0$	$0 \times 0 = 0$
$1 \times 0 = 0$	$0 \times 1 = 0$
$2 \times 0 = 0$	$0 \times 2 = 0$
$3 \times 0 = 0$	$0 \times 3 = 0$
$4 \times 0 = 0$	$0 \times 4 = 0$
$5 \times 0 = 0$	$0 \times 5 = 0$
$6 \times 0 = 0$	$0 \times 6 = 0$
$7 \times 0 = 0$	$0 \times 7 = 0$
$8 \times 0 = 0$	$0 \times 8 = 0$
$9 \times 0 = 0$	$0 \times 9 = 0$
$10 \times 0 = 0$	$0 \times 10 = 0$
$11 \times 0 = 0$	$0 \times 11 = 0$
$12 \times 0 = 0$	$0 \times 12 = 0$

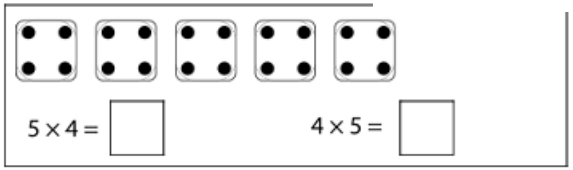
Multiplication

Year 3

Children in Year 3 will build on their knowledge of Year 2. They will explore the relationships between the 2,4 and 8.

Counting in multiples of four can be represented by the four times table.





There are _____ equal groups with _____ in each group.

There are _____ altogether.

Double _____ is _____ and double _____ is _____, so 4 lots of _____ is _____

There are four, _____ times

4 x ___ =

____ x 4 =

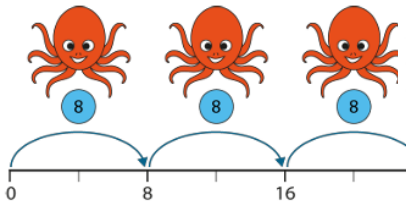
	× 4
0	0
1	4
2	8
3	
4	16
5	20
6	24
7	
8	32
9	36
10	40
11	44
12	48

↓ +4 $3 \times 4 = 2 \times 4 + 4$

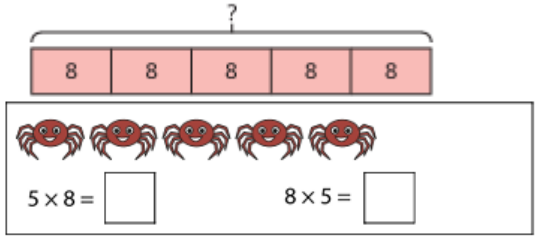
↑ −4 $7 \times 4 = 8 \times 4 - 4$

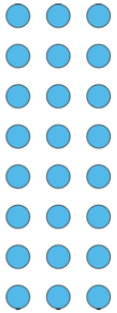
$0 \times 4 = 0$	$4 \times 0 = 0$
$1 \times 4 = 4$	$4 \times 1 = 4$
$2 \times 4 = 8$	$4 \times 2 = 8$
$3 \times 4 = 12$	$4 \times 3 = 12$
$4 \times 4 = 16$	$4 \times 4 = 16$
$5 \times 4 = 20$	$4 \times 5 = 20$
$6 \times 4 = 24$	$4 \times 6 = 24$
$7 \times 4 = 28$	$4 \times 7 = 28$
$8 \times 4 = 32$	$4 \times 8 = 32$
$9 \times 4 = 36$	$4 \times 9 = 36$
$10 \times 4 = 40$	$4 \times 10 = 40$
$11 \times 4 = 44$	$4 \times 11 = 44$
$12 \times 4 = 48$	$4 \times 12 = 48$

Counting in multiples of eight can be represented by the eight times table



'Three is a factor.'
'Eight is a factor.'
'The product of three and eight is twenty-four.'
'Twenty-four is the product of three and eight.'





There are ___ groups of eight
There are eight, _____ times
8 x ___ =
____ x 8 =

'Products in the eight times table are also in the four times table.'
'The product of an even number and four is a product in the eight times table.'

'Five times eight is forty, so six times eight is forty plus eight.'

6 × 8 = 5 × 8 + 8
= 40 + 8
6 × 8 = 48

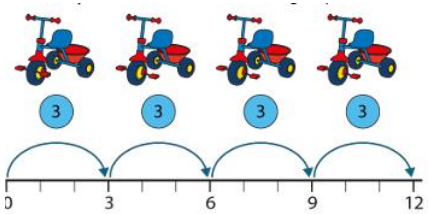
	× 8
0	0
1	8
2	16
3	
4	32
5	40
6	48
7	
8	64
9	72
10	80
11	88
12	96

↓ + 8 $3 \times 8 = 2 \times 8 + 8$

↑ − 8 $7 \times 8 = 8 \times 8 - 8$

0 × 8 = 0	8 × 0 = 0
1 × 8 = 8	8 × 1 = 8
2 × 8 = 16	8 × 2 = 16
3 × 8 = 24	8 × 3 = 24
4 × 8 = 32	8 × 4 = 32
5 × 8 = 40	8 × 5 = 40
6 × 8 = 48	8 × 6 = 48
7 × 8 = 56	8 × 7 = 56
8 × 8 = 64	8 × 8 = 64
9 × 8 = 72	8 × 9 = 72
10 × 8 = 80	8 × 10 = 80
11 × 8 = 88	8 × 11 = 88
12 × 8 = 96	8 × 12 = 96

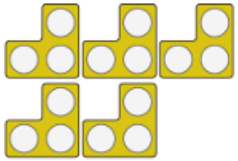
Counting in multiples of three can be represented by the three times table



- *'Three, six, nine, twelve. There are twelve wheels.'*
- *'There are four groups of three; there are twelve altogether.'*
- *'There are three, four times; there are twelve altogether.'*

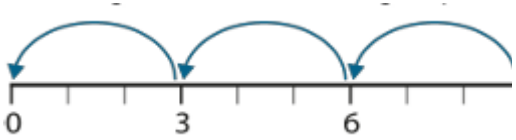
4 × 3 = 12 3 × 4 = 12

'___ is a factor.'
'___ is a factor.'
'The product of ___ and ___ is ___.'
'___ is the product of ___ and ___.'



'Three threes, two threes, one three, zero threes.'
'Three, three times; three, two times; three, one time; three, zero times.'
'Nine, six, three, zero.'

0 × 3 = 0 3 × 0 = 0



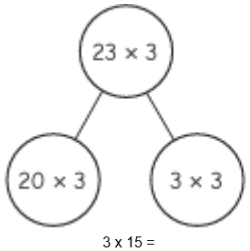
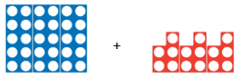
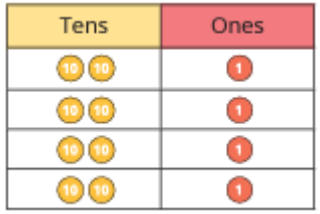
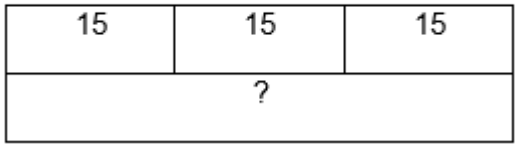
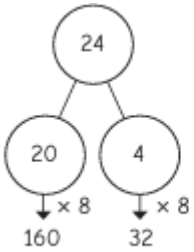
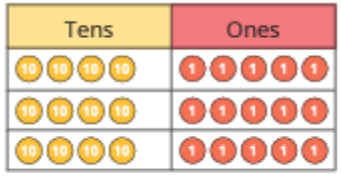
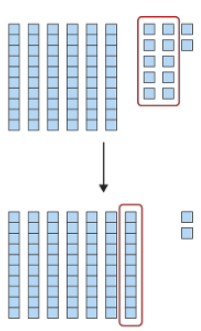
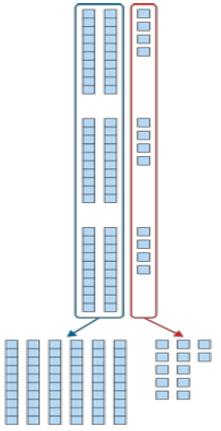
There are ___ groups of three
There are three, _____ times
3 x ___ =
____ x 3 =
_____

	× 3
0	0
1	3
2	6
3	
4	12
5	15
6	18
7	
8	24
9	27
10	30
11	33
12	36

↓ + 3 $3 \times 3 = 2 \times 3 + 3$

↑ − 3 $7 \times 3 = 8 \times 3 - 3$

0 × 3 = 0	3 × 0 = 0
1 × 3 = 3	3 × 1 = 3
2 × 3 = 6	3 × 2 = 6
3 × 3 = 9	3 × 3 = 9
4 × 3 = 12	3 × 4 = 12
5 × 3 = 15	3 × 5 = 15
6 × 3 = 18	3 × 6 = 18
7 × 3 = 21	3 × 7 = 21
8 × 3 = 24	3 × 8 = 24
9 × 3 = 27	3 × 9 = 27
10 × 3 = 30	3 × 10 = 30
11 × 3 = 33	3 × 11 = 33
12 × 3 = 36	**3 × 12 = 36**

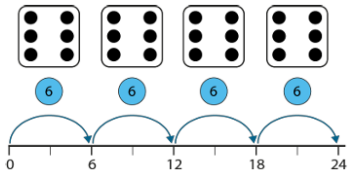
Multiply a 2-digit number by a 1-digit number - no regrouping *Distributive Law of Multiplication - partitioning the two-digit number into tens and ones, multiplying the parts by the single-digit number, then adding the partial products.*	Children in Year 3 will consolidate their understanding on the expanded method. **Note**: Formal short multiplication is not introduced until Year 4  20 × 3 = 60 3 × 3 = 9 23 × 3 = 69  3 tens × 2 = _____ tens 2 ones × 2 = _____ ones _____ + _____ = _____ 32 × 2 = _____ _____ tens and _____ ones multiplied by _____ is equal to _____ tens multiplied by _____ and _____ ones multiplied by _____ _____ tens multiplied by _____ is equal to _____ _____ ones multiplied by _____ is equal to _____ _____ multiplied by _____ is equal to _____ _____ × _____ = _____ tens × _____ + _____ × _____ 3 x 15 =  becomes  3 x 10 + 3 x 5  3 x 15 =  *'15 is equal to 10 plus 5.* *So 3 times 15 is equal to 3 times 10 plus 3 times 5.'*
Multiply a 2-digit number by a 1-digit number - with regrouping	 160 + 32 = 192 24 x 8 = 192 _____ tens and _____ ones multiplied by _____ is equal to _____ tens multiplied by _____ and _____ ones multiplied by _____ _____ ones is _____ tens and _____ ones. _____ × _____ = _____ tens × _____ + _____ × _____  2 tens × 4 = _____ tens 4 ones × 4 = _____ ones 24 × 4 = _____ + _____ = _____ 24 × 4 = _____   24 × 3 = 60 + 10 + 2 = 70 + 2 = 72 • *'Twelve ones is equal to one ten and two ones.'* 12 ones = 1 ten + 2 ones  24 × 3 = 20 × 3 + 4 × 3 = 60 + 12 • *'Two-tens-and-four-ones multiplied by three is equal to two tens multiplied by three and four ones multiplied by three.'* 2 tens × 3 = 6 tens 4 ones × 3 = 12 ones

Multiplication

Year 4

Children will begin to explore the relationship between the 3,6 and 9 timestables
Products in the nine times table are triple the products in the three times table. Products that are in the three, six- and nine-times tables share the same factors.
Products in the six times table are double the products in the three times table; products in the three times table are half of the products in the six times table.
Children in Year 4 will continue to learn times tables in the same way as above. They will continue to consolidate the idea that multiplication is distributive. Multiplication facts can be derived from related known facts by partitioning one of the factors.
They will also build on their knowledge that 12 times tables are double the products of the six times tables.

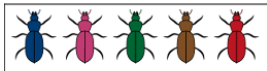
Counting in multiples of six can be represented by the six times table.



- *'Six, twelve, eighteen, twenty-four. There are twenty-four dots.'*
- *'There are four groups of six; there are twenty-four altogether.'*
- *'There is six, four times; there are twenty-four altogether.'*

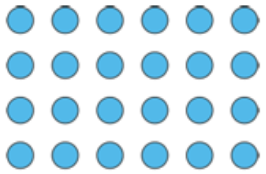
$4 \times 6 = 24$ $6 \times 4 = 24$

'___ is a factor.'
'___ is a factor.'
'The product of ___ and ___ is ___.'
'___ is the product of ___ and ___.'



$5 \times 6 =$ $6 \times 5 =$

'Six is double three, so ___ sixes are double ___ threes.
'Three is half of six, so ___ threes are half of ___ sixes.'



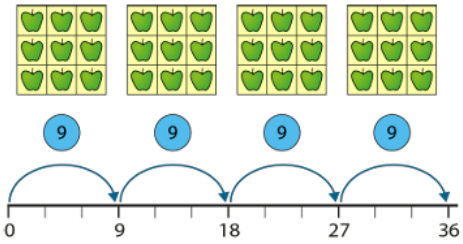
There are ___ groups of six
There are six, _____ times

6 x ___ =

	×6		
0	0		
1	6		
2	12	↓ +6	$3 \times 6 = 2 \times 6 + 6$
3			
4	24		
5	30		
6	36		
7		↑ −6	$6 \times 6 = 7 \times 6 - 6$
8	48		
9	54		
10	60		
11	66		
12	72		

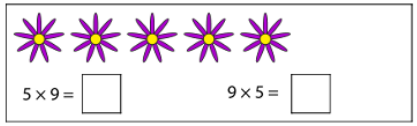
$0 \times 6 = 0$	$6 \times 0 = 0$
$1 \times 6 = 6$	$6 \times 1 = 6$
$2 \times 6 = 12$	$6 \times 2 = 12$
$3 \times 6 = 18$	$6 \times 3 = 18$
$4 \times 6 = 24$	$6 \times 4 = 24$
$5 \times 6 = 30$	$6 \times 5 = 30$
$6 \times 6 = 36$	$6 \times 6 = 36$
$7 \times 6 = 42$	$6 \times 7 = 42$
$8 \times 6 = 48$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

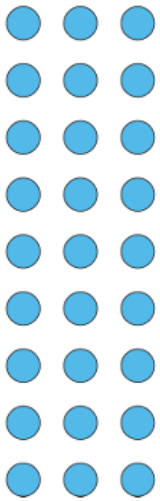
Counting in multiples of nine can be represented by the nine times table



- *'Nine, eighteen, twenty-seven, thirty-six. There are thirty-six apples.'*
- *'There are four groups of nine; there are thirty-six altogether.'*
- *'There are nine, four times; there are thirty-six altogether.'*

$4 \times 9 = 36$ $9 \times 4 = 36$





	× 9
0	0
1	9
2	18
3	
4	36
5	45
6	54
7	
8	72
9	81
10	90
11	99
12	108

↓ + 9 $3 \times 9 = 2 \times 9 + 9$

↑ − 9 $7 \times 9 = 8 \times 9 - 9$

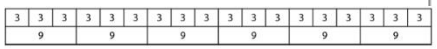
- *'One group of nine is equal to nine. Two groups of nine is equal to eighteen…'*
- *'One times nine is equal to nine. Two times nine is equal to eighteen…'*

then shortening to

'One nine is nine, two nines are eighteen…'

and

- *'Nine, one time is equal to nine…'*
  'Nine, two times is equal to eighteen…'
- *'Nine times one is equal to nine…'*
  'Nine times two is equal to eighteen…'



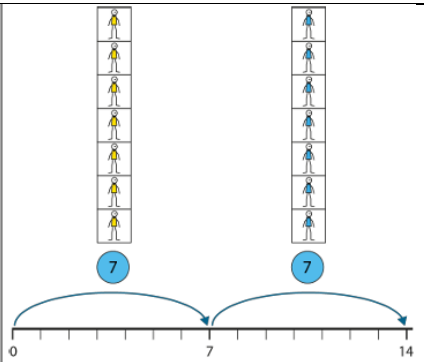
Example 2:

$0 \times 9 = 0$	$9 \times 0 = 0$
$1 \times 9 = 9$	$9 \times 1 = 9$
$2 \times 9 = 18$	$9 \times 2 = 18$
$3 \times 9 = 27$	$9 \times 3 = 27$
$4 \times 9 = 36$	$9 \times 4 = 36$
$5 \times 9 = 45$	$9 \times 5 = 45$
$6 \times 9 = 54$	$9 \times 6 = 54$
$7 \times 9 = 63$	$9 \times 7 = 63$
$8 \times 9 = 72$	$9 \times 8 = 72$
$9 \times 9 = 81$	$9 \times 9 = 81$
$10 \times 9 = 90$	$9 \times 10 = 90$
$11 \times 9 = 99$	$9 \times 11 = 99$
$12 \times 9 = 108$	$9 \times 12 = 108$

There are ___ groups of nine
There are nine groups of ____
9 x ___ =
____x 9 =

'Nine is triple three, so ___ nines is triple ___ threes.'

Counting in multiples of seven can be represented by the seven times table.



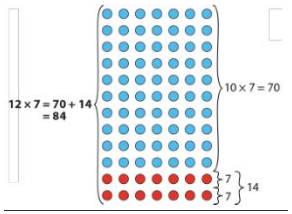
- *'Seven, fourteen. There are fourteen players.'*
- *'There are two groups of seven; there are fourteen altogether.'*
- *'There are seven, two times; there are fourteen altogether.'*

	×7
0	0
1	7
2	14
3	21
4	28
5	35
6	42
7	49
8	56
9	63
10	70
11	77
12	84

↓ +7 $7 \times 7 = 6 \times 7 + 7$

↓ +7 $11 \times 7 = 10 \times 7 + 7$

↓ +7 $12 \times 7 = 11 \times 7 + 7$

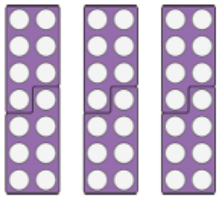


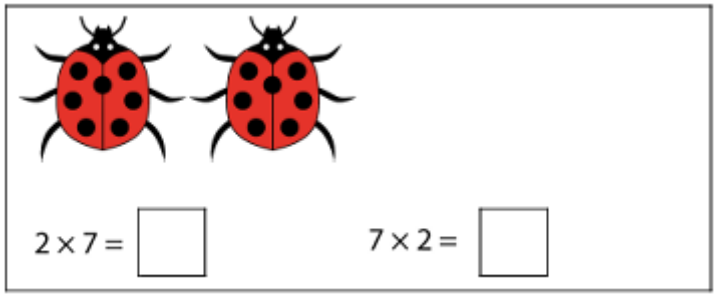
- *'One group of seven is equal to seven.'*
  'Two groups of seven is equal to fourteen…'
- *'One times seven is equal to seven.'*
  'Two times seven is equal to fourteen…'
  then shortening to
  'One seven is seven, two sevens are fourteen…'

and

- *'Seven, one time is equal to seven…'*
  'Seven, two times is equal to fourteen…'
- *'Seven times one is equal to seven…'*
  'Seven times two is equal to fourteen…'

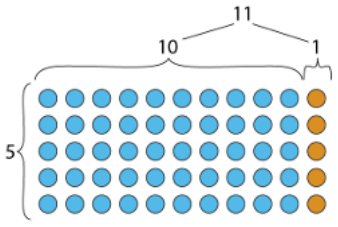
× 7 = 0	7 × 0 = 0
× 7 = 7	7 × 1 = 7
× 7 = 14	7 × 2 = 14
× 7 = 21	7 × 3 = 21
× 7 = 28	7 × 4 = 28
× 7 = 35	7 × 5 = 35
× 7 = 42	7 × 6 = 42
× 7 = 49	7 × 7 = 49
× 7 = 56	7 × 8 = 56
9 × 7 = 63	7 × 9 = 63
10 × 7 = 70	7 × 10 = 70
11 × 7 = 77	7 × 11 = 77
12 × 7 = 84	7 × 12 = 84





There are ___ groups of seven
There are seven, _____ times
9 x ___ =
____x 9 =

The distributive law can be used to build up the 11 times table by partitioning 11 into 10 and 1.



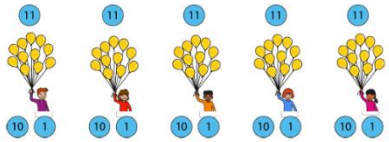
$11 = 5 \times 10 + 5 \times 1$

$= 50 + 5$

$= 55$

$5 \times 11 =$ 55 $11 \times 5 =$ 55

- *'Five groups of eleven is equal to fifty-five.'*
- *'Eleven, five times is equal to fifty-five.'*



	×11
0	0
1	11
2	22
3	
4	44
5	55
6	66
7	
8	88
9	99
10	110
11	121
12	132

↓ +11 $3 \times 11 = 2 \times 11 + 11$
$= 22 + 10 + 1$

↑ −11 $7 \times 11 = 8 \times 11 - 11$
$= 88 - 10 - 1$

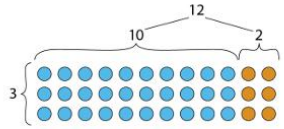
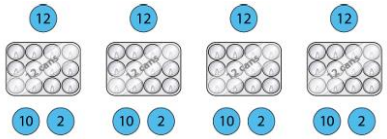
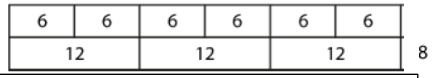
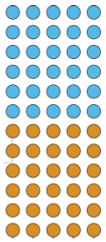
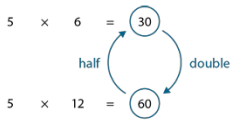
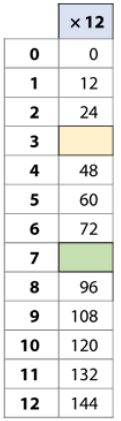
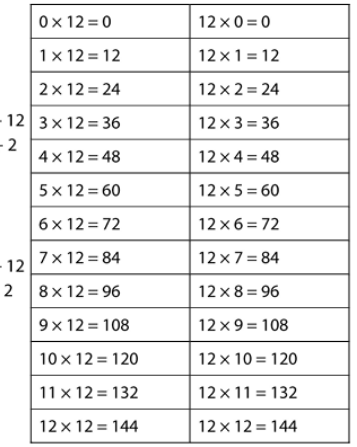
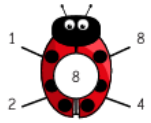
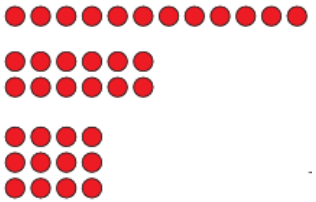
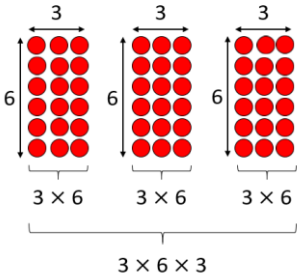
- *'One group of eleven is equal to eleven.'*
  'Two groups of eleven is equal to twenty-two…'
- *'One times eleven is equal to eleven.'*
  'Two times eleven is equal to twenty-two…'
  then shortening to
  'One eleven is eleven, two elevens are twenty-two…'

and

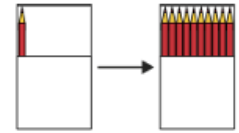
- *'Eleven, one time is equal to eleven…'*
  'Eleven, two times is equal to twenty-two…'
- *'Eleven times one is equal to eleven…'*
  'Eleven times two is equal to twenty-two…'

$10 \times 11 = 9 \times 11 + 11$
$= 99 + 11$
$= 99 + 1 + 10$
$= 100 + 10$
$= 110$

0 × 11 = 0	11 × 0 = 0
1 × 11 = 11	11 × 1 = 11
2 × 11 = 22	11 × 2 = 22
3 × 11 = 33	11 × 3 = 33
4 × 11 = 44	11 × 4 = 44
5 × 11 = 55	11 × 5 = 55
6 × 11 = 66	11 × 6 = 66
7 × 11 = 77	11 × 7 = 77
8 × 11 = 88	11 × 8 = 88
9 × 11 = 99	11 × 9 = 99
10 × 11 = 110	11 × 10 = 110
11 × 11 = 121	11 × 11 = 121
12 × 11 = 132	11 × 12 = 132

The distributive law can be used to build up the 12 times table by partitioning 12 into 10 and 2.	 $3 \times 12 = \square$ $12 \times 3 = \square$   Children will also look at the relationship between the six and twelve times table.  *For every one group of twelve, there are two groups of six* $8 \times 12 = 8 \times 10 + 8 \times 2$ $= 80 + 16$ $= 96$   • *'Six is half of twelve, so five sixes is half of five-twelves.'* • *'Twelve is double six, so five twelves is double five-sixes.'*  ↓ + 12 ↑ − 12 $3 \times 12 = 2 \times 12 + 12$ $= 24 + 10 + 2$ $7 \times 12 = 8 \times 12 - 12$ $= 96 - 10 - 2$ • *'One twelve is twelve, two twelves are twenty-four…'* and • *'Twelve, one time is equal to twelve.'* *'Twelve, two times is equal to twenty-four…'* • *'Twelve times one is equal to twelve.'* *'Twelve times two is equal to twenty-four…'* 
Factor Pairs	 $7 \times 8 = 7 \times 4 \times 2 = 28 \times 2$ double 28 is 56, so $7 \times 8 = 56$ $18 \times 3 = 3 \times 6 \times 3$ $= 3 \times 3 \times 6$ $= 9 \times 6 = 54$ $18 \times 3 = 54$  $9 \times 6 = 54$  $3 \times 6 \times 3$ The factor pairs of _____ are _____ 12 = _____ × _____, so _____ × 12 = _____ × _____ × _____ I can use the factor pairs of _____ to find an equivalent calculation because …

Multiply by 10



1 × 10

'One multiplied by ten is equal to ten.'

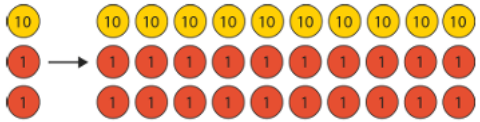
1 × 10 = 10

'Ten is ten times the size of one.'

'Ten pencils is ten times as many as one pencil. Jamie has ten pencils.'

1,000s	100s	10s	1s
			●
		●	
	●		
●			

ten times the size | ten times the size | ten times the size



1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

× 10

_____ × 10 = _____

10 × _____ = _____

_____ is 10 times the size of ___

When a number is multiplied by ten, the product is a multiple of ten.

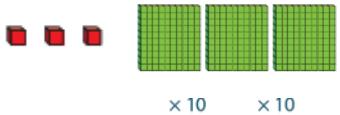
'Think of ___ and make it ten times the size.'

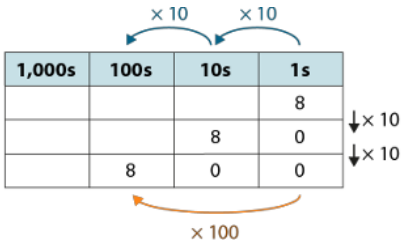
'Think of ___ and multiply by ten.'

'___ multiplied by ten is equal to ___.'

'___ is ten times the size of ___.'

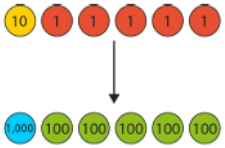
Multiply by 100

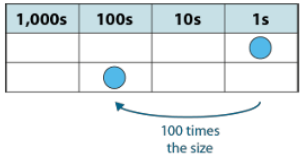




1,000s	100s	10s	1s
			8
		8	0
	8	0	0

× 10 × 10 × 100





100 times the size

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

× 100

_____ × 100 = _____ × 10 × 10 = _____ × 10 = _____

_____ × 100 = _____, so 100 × _____ = _____

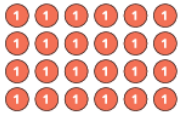
_____ is 100 times the size of _____

'___ multiplied by one hundred is equal to ___.'

'___ is one hundred times the size of ___.'

Partitioning to Multiply and Related facts

Complete the number sentences.

a)  4 × 6 ones

b)  4 × 6 tens

c)  4 × 6 hundreds

Method 1

15 × 8 = 10 × 8 + 5 × 8

= 80 + _____

= _____

Method 2

15 × 8 = 3 × 5 × 8

= 3 × _____

= _____

Method 3

15 × 8 = 15 × 10 − 15 × 2

= _____ − _____

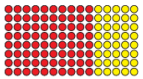
= _____

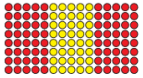
Method 4

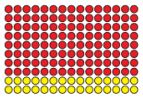
15 × 8 = 30 × 8 ÷ 2

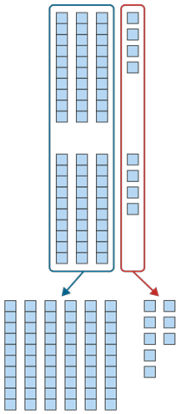
= _____ ÷ 2

= _____









5 × 8 = 5 × 4 × _____

7 × 4 = 7 × 2 × _____

34 × 2 = 30 × 2 + 4 × 2

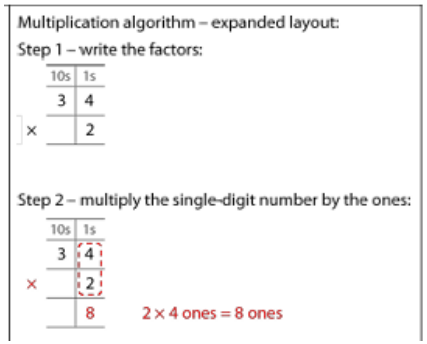
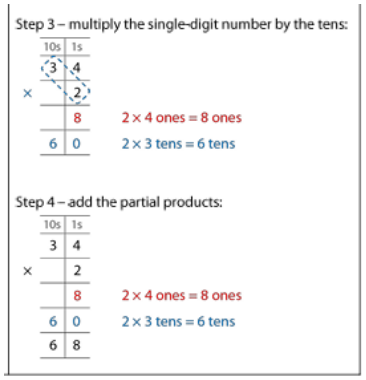
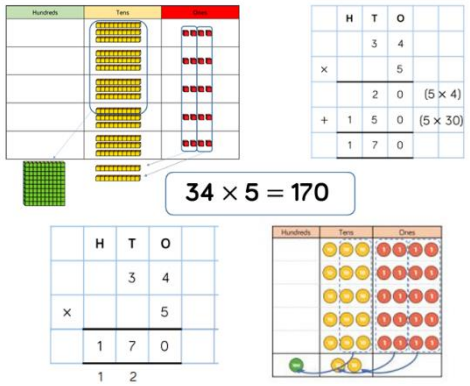
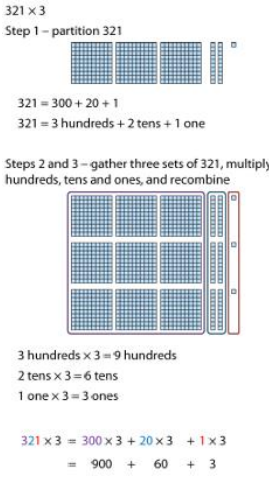
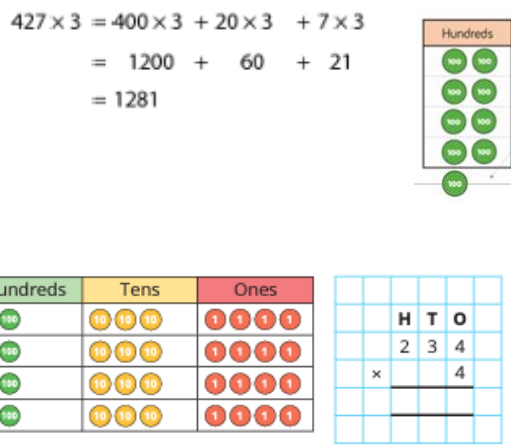
= 60 + 8

= 68

- *'Three-tens-and-four-ones multiplied by two is equal to three tens multiplied by two and four ones multiplied by two.'*

3 tens × 2 = 6 tens

4 ones × 2 = 8 ones

Multiply a 2-digit number by a 1-digit number	   _____ ones × _____ = _____ ones, _____ tens × _____ = _____ tens To multiply a 2-digit number by _____, you multiply the _____ by _____ and the _____ by _____ _____ tens multiplied by _____ plus the ten I exchange is equal to _____ tens.
Multiply a 3-digit number by a 1-digit number	  _____ ones × _____ = _____ ones _____ tens × _____ = _____ tens _____ hundreds × _____ = _____ hundreds _____ tens/hundreds multiplied by _____ plus the ten/ hundred from the exchange is equal to _____

Multiplication

Year 5/6

Multiply up to a 4-digit number by a 1-digit number

	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

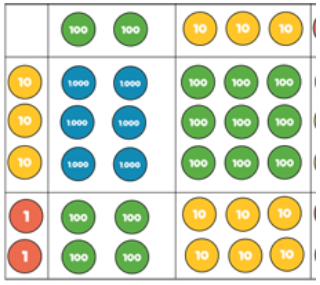
_____ ones × _____ = _____ ones + _____ tens

_____ tens × _____ = _____ tens + _____ hundreds

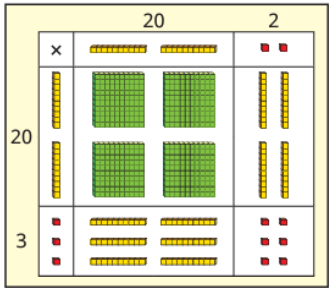
_____ hundreds × _____ = _____ hundreds + _____ thousands

_____ thousands × _____ = _____ thousands + _____ ten-thousands

Multiply a 2-digit number by a 2-digit number (area model)



×	200	30
30	6,000	900
2	400	60



23 × 22
= 400 + 60 + 40 + 6
= 506

Multiply a 2-digit number by a 2-digit number

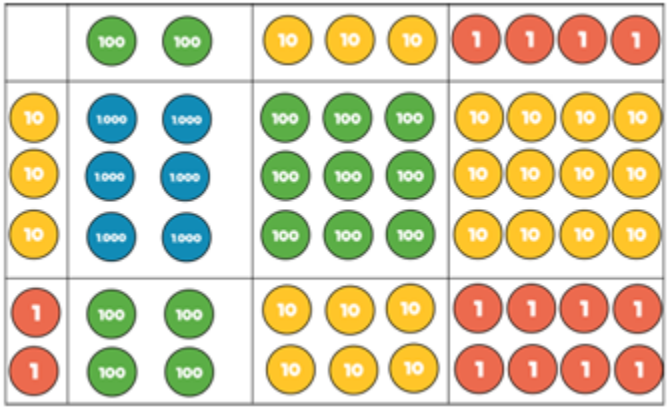
TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 (2)	1 (5)	9 (3)	1 (7)	2
5 (1)	4	7 (1)	8	0
7	6	6	9	2
		1		

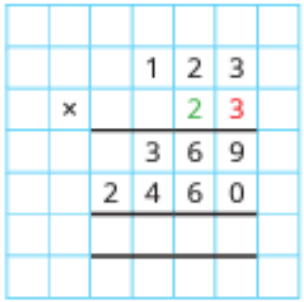
(32 × 3)
(32 × 10)

First, I multiply _____ by _____ ones.
Then I multiply _____ by _____ tens.
Finally, I add together _____ and _____

I need to regroup here because…

Multiply a 3-digit number by a 2-digit number





(123 × 3)
(123 × 20)

First, I multiply _____ by _____ ones.
Then I multiply _____ by _____ tens.
Finally, I add together _____ and _____

I need to regroup here because…

×	200	30	4
30	6,000	900	120
2	400	60	8

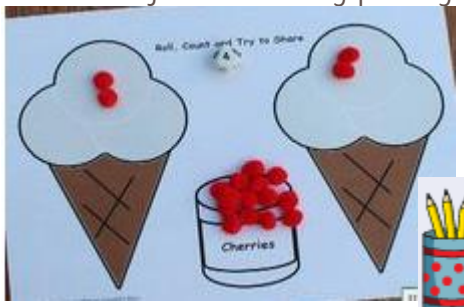
Multiply a 4-digit number by a 2-digit number	*Children at this stage should now be confident in using the above methods and can use a formal written method for multipying 4 digits by 2 digits.* 

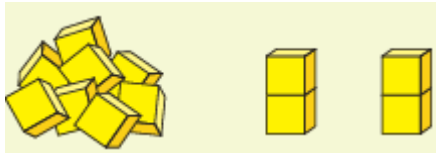
TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 (2)	1 (5)	9 (3)	1 (7)	2
5 (1)	4	7 (1)	8	0
7	6	6	9	2
		1		

Division

EYFS

Exploring Sharing and Grouping	Children in the EYFS will begin to explore their understanding of grouping and sharing through 'fairness'. They will start with non-quantities sharing and moving onto distributive sharing. Experiences help children build small groups with the same number of objects and make "fair shares" by passing out those groups or by "dealing out" one at a time.





It is fair because...

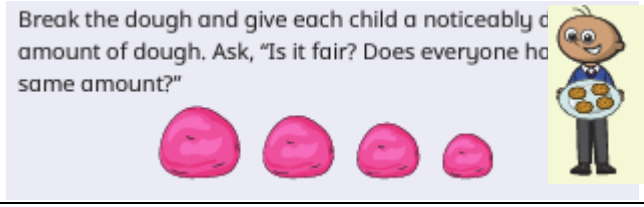
It is not fair because...

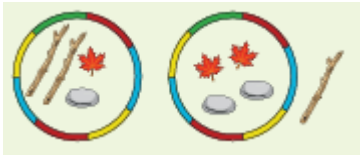
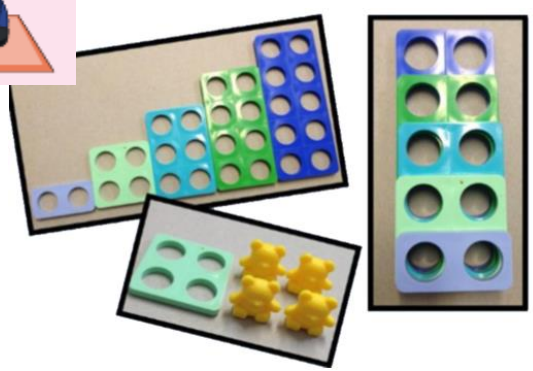
The _____ have/have not been shared equally.

The _____ have/have not been shared equally.

There are _____ altogether.

They are shared equally between _____ groups.

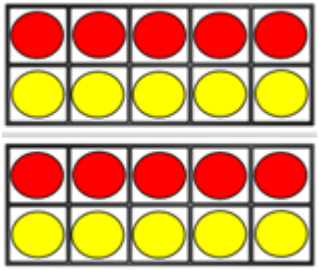


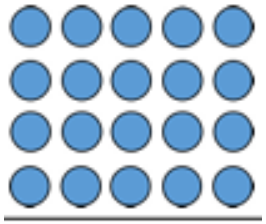
Even and Odd sharing	Children are encouraged to talk through the sharing process, explaining what they notice and how they know whether an amount is odd or even. To do this, ensure that children are provided with a range of hands-on experiences that use varied resources and different numbers of objects.    

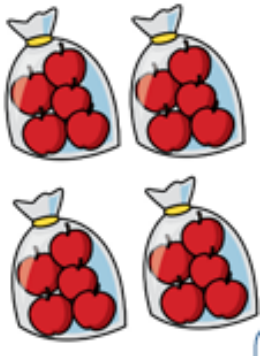
Division

Year 1

Make equal groups – grouping







The groups are equal/not equal because ...

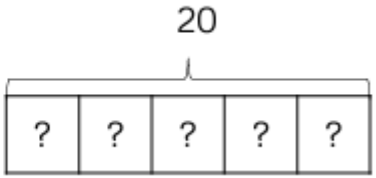
There are _____ altogether.

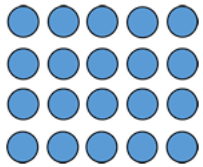
They can be put into equal groups of _____

There are _____ groups.

There are _____ groups of 2 mittens.

Make equal groups - sharing





The _____ have/have not been shared equally.

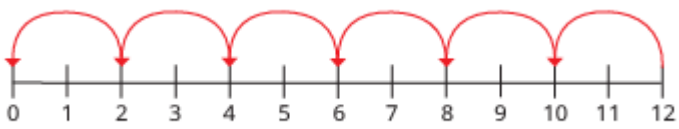
I know this because ...

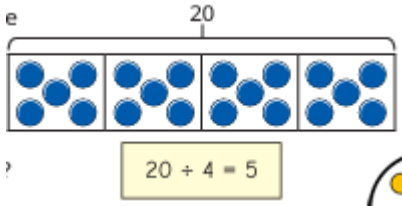
There are _____ altogether.

They are shared equally between _____ groups.

There are _____ in each group.

Division Year 2	
Sharing and grouping	Children in Year 2 will use the representations in Year 1. The division symbol is introduced here and used alongside representations.





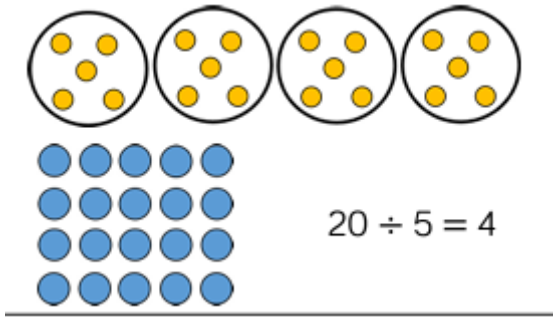
There are 20 buckets.

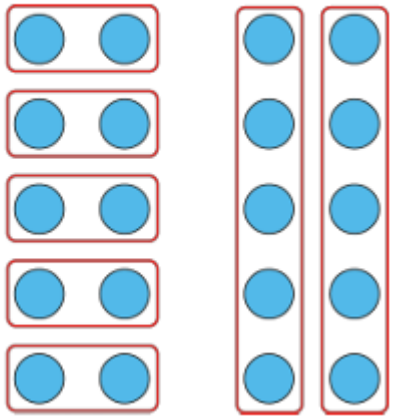
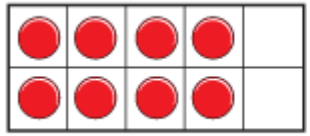
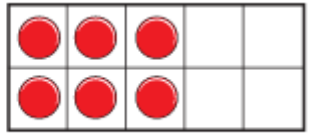
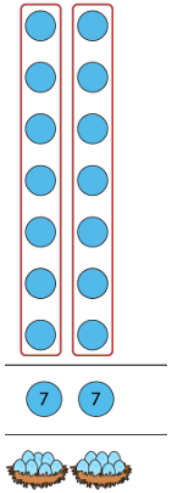
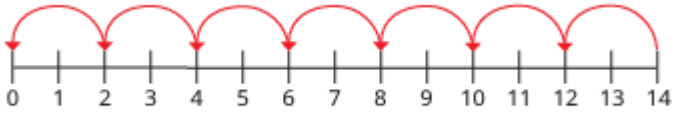
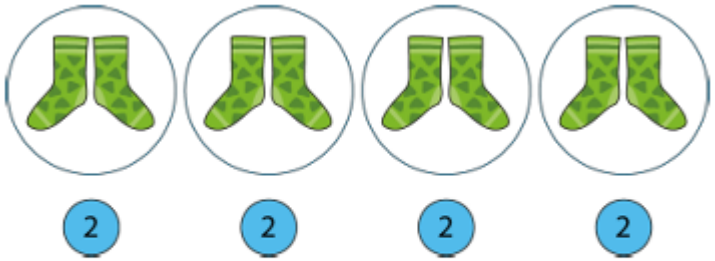
- Circle groups of 5

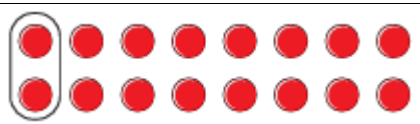
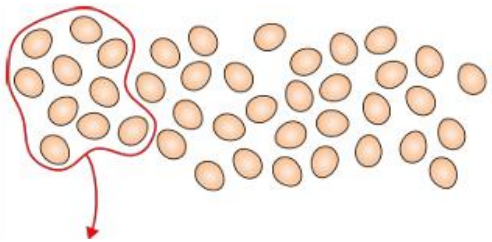
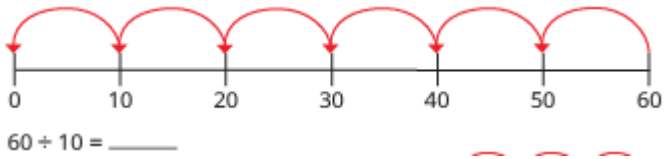
  How many groups did you circle?

- Complete the number sentence.

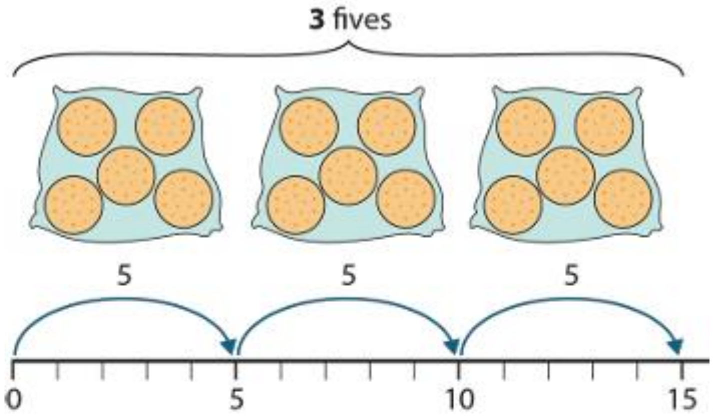
  20 ÷ 5 = _____



Doubling and halving	*'What's the same?'* *'What's different?'*  Double _____ is _____ Half of _____ is _____ Double _____ is _____, so double _____ is _____ Half of _____ is _____, so half of _____ is _____   
Divide by 2	 _____ × 2 = 16 16 ÷ 2 = _____  _____ × 2 = _____ _____ ÷ 2 = _____  14 ÷ 2 ***'___ is divided into groups of ___. There are ___ groups.'*** ***'___ is divided into ___ groups of ___.'***  • *'Eight is divided into groups of two. There are <u>four</u> groups.'* • *'There are <u>four</u> groups of two in eight.'*

	
Divide by 10	   60 ÷ 10 = _____ • *'Forty divided into groups of ten.'* 40 ÷ 10 • *'The "40" represents the total number of eggs.'* • *'The "10" represents the number of eggs in each group/box.'* There are _____ altogether. There are _____ in each group. There are _____ groups. _____ ÷ 10 = _____

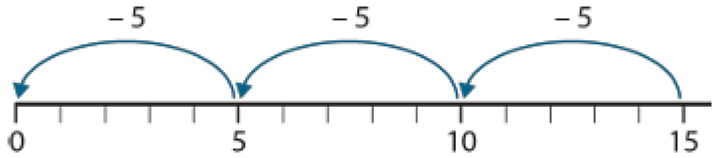
Divide by 5	

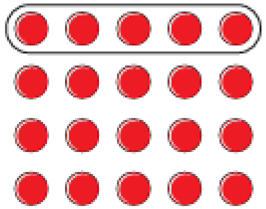


$5 + 5 + 5 = 15$

$15 \div 5 = 3$

'Fifteen divided into groups of five is equal to three.'



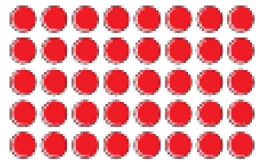


There are ______ altogether.

There are ______ in each group.

There are ______ groups.

______ ÷ 5 =



______ × 5 = ______

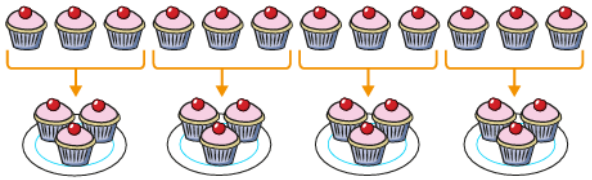
______ ÷ 5 = ______

Division

Year 3

Divide by four and eight

Children in Year 3 will use their knowledge of the two, four and eight times tables to divide. They will continue to discuss equal grouping and sharing and will further explore using their knowledge of times table facts.

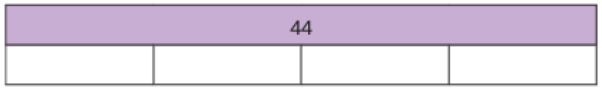


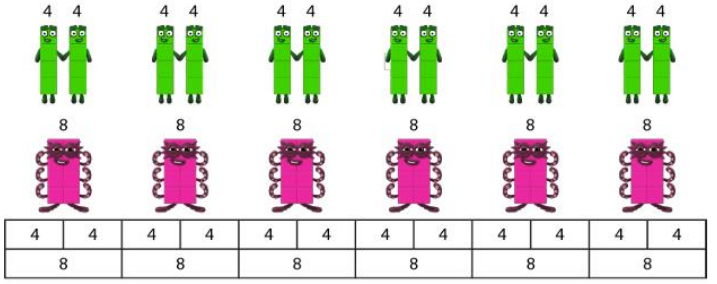
Number	**0**	1	2	3	**4**	5	6	7	**8**	9	10	11	**12**	13	14	15	**16**	17	18	19	**20**	21	22	23	**24**
Counting in 4s	✓				✓				✓				✓				✓				✓				✓
Counting in 8s	✓								✓								✓								✓

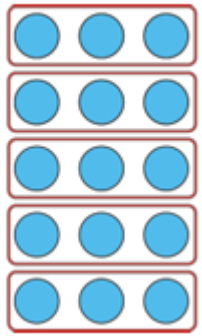
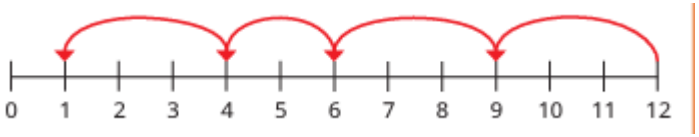
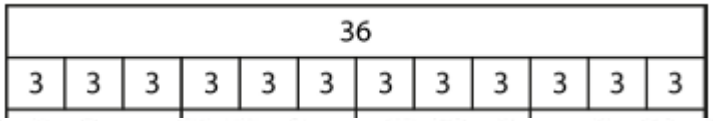
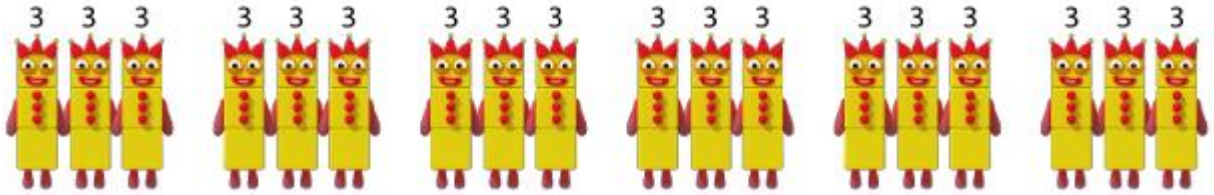
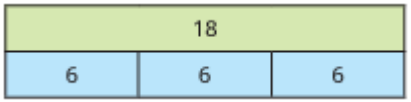
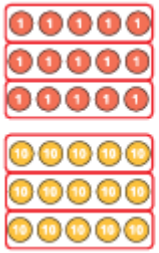
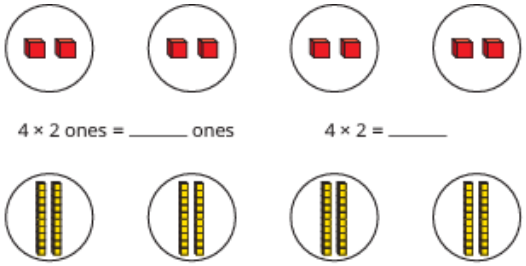
48 ÷ 8 = ?

I can use this multiplication fact: ___ × ___ = ____

Number	Divided equally by 2 is . . .	Divided equally by 4 is . . .
2	1	does not divide equally
4		





Divide by 3	'There are five groups of three.'   There are _____ groups. There are _____ in each group. _____ has been shared equally into _____ equal groups. There are _____ groups of _____ in _____  ***'For a number to be divisible by three, the sum of the digits of the number must be divisible by three.'***  
Divide using related calculations	 15 ÷ 3 = _____ 15 tens ÷ 3 = _____  4 × 2 ones = _____ ones 4 × 2 = _____ 4 × 2 tens = _____ tens 4 × 20 = _____ 27 ÷ 9 = _____ ▸ 54 ÷ 6 = _____ ▸ 48 ÷ 4 = _____ 270 ÷ 9 = _____ 540 ÷ 6 = _____ 480 ÷ 4 = _____ _____ × _____ ones is equal to _____ ones, so _____ × _____ tens is equal to _____ tens. _____ ÷ _____ is equal to _____, so _____ tens ÷ _____ is equal to _____ tens.

Divide by 10 /100

÷ 10

÷ 10

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
0	100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500

÷ 100

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

÷ 10

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

÷ 10

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

÷ 100

÷ 10 ÷ 10

1,000s	100s	10s	1s
	7	0	0
		7	0
			0

÷ 10

÷ 10

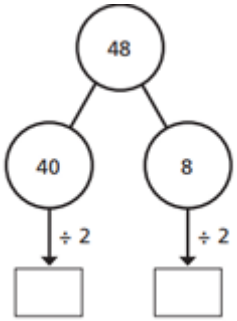
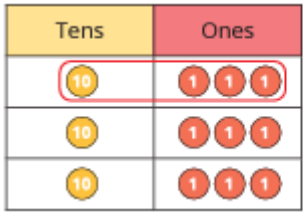
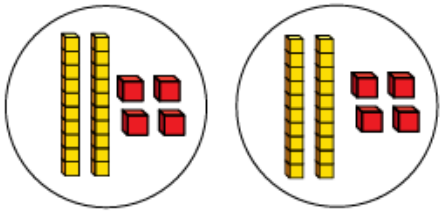
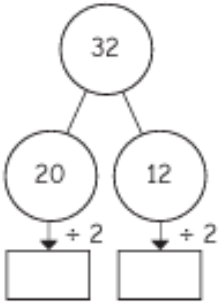
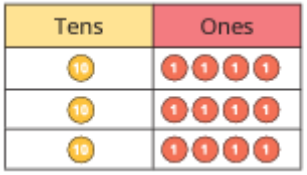
÷ 100

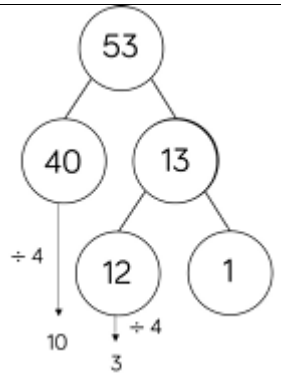
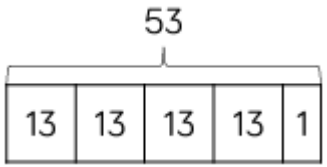
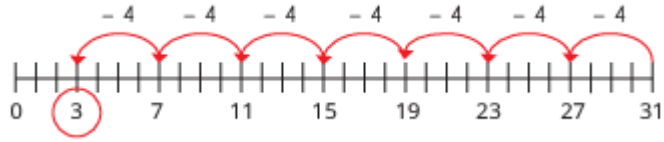
Dividing by ten is equivalent to dividing by ten then dividing by ten again.

700 ÷10 = 70 — 700 divided by 10: remove '0' from the ones place.

70 ÷10 = 7 — 70 divided by 10: remove '0' from the ones place.

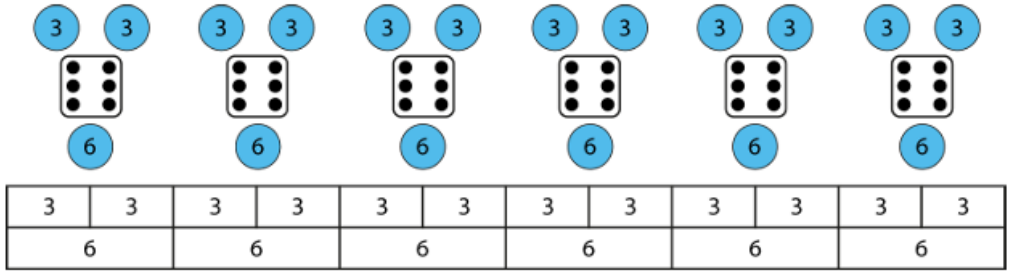
700 ÷ 100 = 7 — 700 divided by 100: remove two '0's.

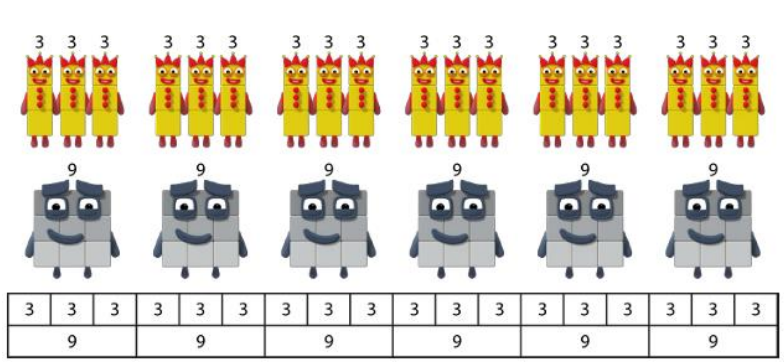
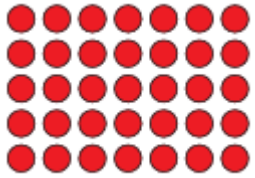
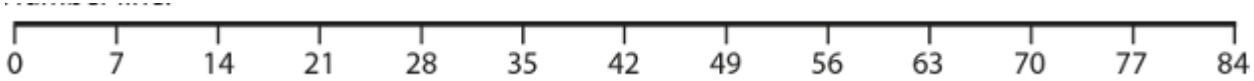
Divide a 2 digit number by a 1 digit number- no exchange	  39 ÷ 3 = 13  _____ partitioned into tens and ones is _____ tens and _____ ones. _____ divided by _____ is equal to _____
Divide a 2 digit number by a 1 digit number -flexible partitioning	 6 tens ÷ 3 = 2 tens 12 ones ÷ 3 = 4 ones 72 ÷ 3 = 24  42 ÷ 3 = 14 _____ can be partitioned into _____ and _____, as these numbers are both multiples of _____ _____ divided by _____ is equal to _____

Divide a 2 digit number by a 1 digit number- with remainders	    There are _____ groups of _____ There are _____ remaining. So _____ ÷ _____ = _____ r_____

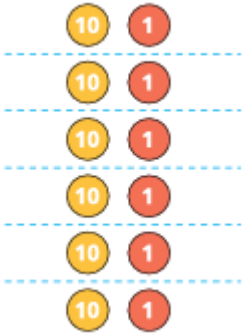
Division

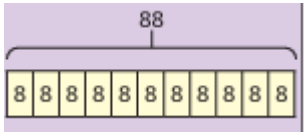
Year 4

Divide by 3,6, 9	Children will continue to divide by these numbers using known multiplication facts. They will recgonise the relationship between 3,6 and 9.  ***For every one group of nine, there are three groups of three.*** ***For a number to be divisible by three, the sum of the digits must be a multiple of three.***

	$12 \div 3 = 4$ $18 \div 3 =$ ☐ $24 \div 3 =$ ☐ $12 \div 6 =$ ☐ $18 \div 6 =$ ☐ $24 \div 6 =$ ☐ ***For every one group of six, there are two groups of three.***  ***For a number to be divisible by nine, the sum of the digits must be a multiple of nine.***
Divide by 7	 ____ × ____ = ____ ____ × ____ = ____ ____ ÷ ____ = ____ ____ ÷ ____ = ____ ____ × 7 = ____ × 5 + ____ × 2 ____ × 7 = ____ × 8 – ____ ____ × 7 = ____ × 6 + ____ There are 7 groups of ____ in ____ There are ____ groups of 7 in ____ 

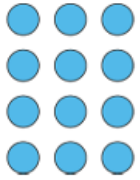
Divide by 11 and 12





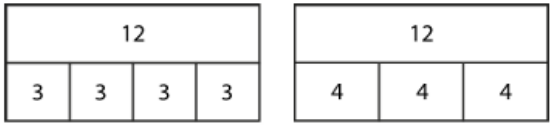
'A two-digit number is divisible by eleven if the digits are the same.'

	× 11
0	0
1	11
2	22
3	33
4	44
5	55
6	66
7	77
8	88
9	99
10	110
11	121
12	132



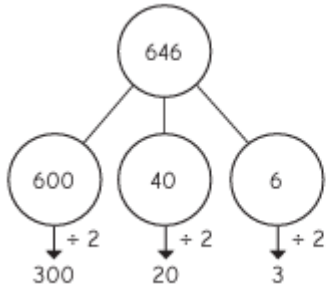
$12 = 4 \times 3$

$12 = 3 \times 4$

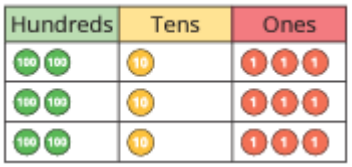


For a number to be divisible by twelve, the number must be divisible by both three and four.

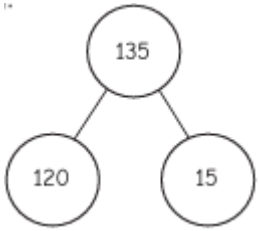
Divide a three digit number by one digit



646 ÷ 2 = 300 + 20 + 3 = 323



639 ÷ 3 = 213

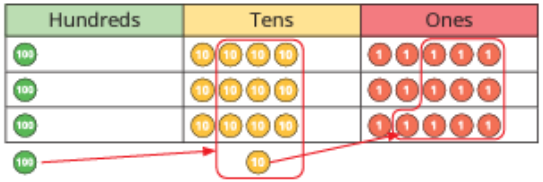


_____ hundreds divided by _____ = _____ hundreds

_____ tens divided by _____ = _____ tens

_____ ones divided by _____ = _____ ones

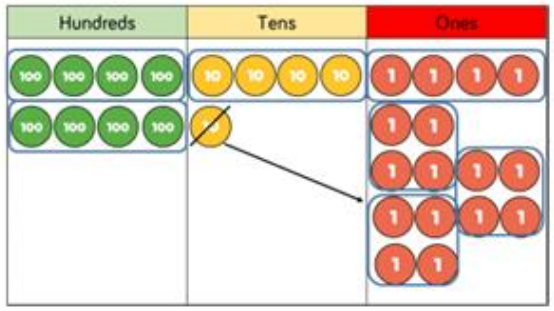
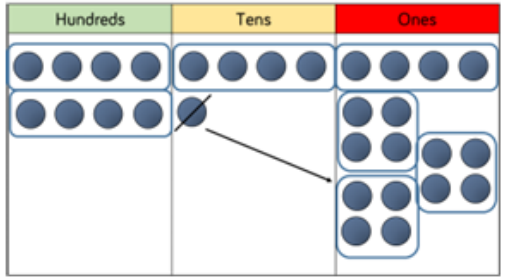
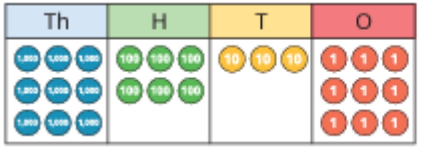
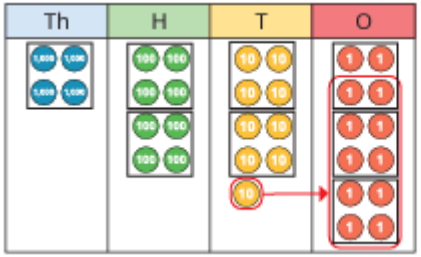
There is _____ left over, so I need to exchange it for _____

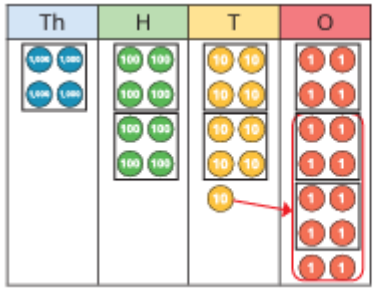
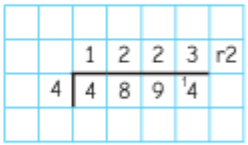
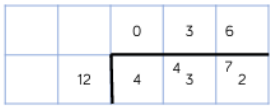
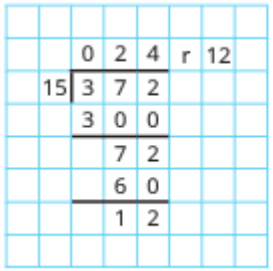


435 ÷ 3 = 145

Division

Year 5/6

Divide by 1000	Children in Year 5 will use their knowledge of dividing by 10 and 100 to divide by 1000. See Year 3 division statement.
Divide 3 digit number by one digit with regrouping	 _____ hundreds divided by _____ is equal to _____ hundreds with a remainder of _____ Exchange the remainder, then _____ tens divided by _____ is equal to _____ tens with a remainder of _____ Exchange the remainder, then _____ ones divided by _____ is equal to _____ ones. 2 1 4 4 8 5 16 
Divide a four digit number by one digit	 3 9 6 3 9  1 2 2 3 4 4 8 9 12 To use the formal method of division, I start with the digit on the _____ and work from _____ to _____ There are _____ groups of _____ thousands/hundreds/tens/ ones in _____ thousands/hundreds/tens/ones.

Divide with remainders	  _____ ones divided by _____ = _____ ones remainder _____ When dividing by _____, the greatest possible remainder is _____
Long division	 **432 ÷ 12 = 36**  (12 × 30) (12 × 6) **Multiples of 12:** 12 × 1 = 12 12 × 2 = 24 12 × 3 = 36 12 × 4 = 48 12 × 5 = 60 12 × 6 = 72 _____ hundreds divided by _____ is equal to _____ hundreds with a remainder of _____ The remainder is exchanged into _____ tens. _____ tens divided by _____ is equal to _____ with a remainder of _____ The remainder is exchanged into _____ ones. **7,335 ÷ 15 = 489**  15 30 45 60 75 90 105 120 135 150
Long division with remainders	 (15 × 20) (15 × 4) **Multiples of 15:** 15 × 1 = 15 15 × 2 = 30 15 × 3 = 45 15 × 4 = 60 _____ hundreds divided by _____ is equal to _____ hundreds with a remainder of _____ The remainder is exchanged for _____ tens. _____ cannot be divided by _____, so there is a _____ of _____

Divide decimals by 10, 100, 1000	
Divide decimals by integers	

100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009

5 ÷ 10 = 0.5
0.8 ÷ 10 = 0.08
5.8 ÷ 10 = 0.58
0.58 is one-tenth the size of 5.8

To divide by 10/100/1,000, I move all the digits _____ places to the right.

_____ is one-tenth the size of _____

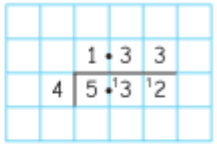
Dividing by 100/1,000 is the same as dividing by 10 _____ times.

H	T	O	Tth	Hth	Thth
	2	7			

27 ÷ 10 = _____

27 ÷ 100 = _____

27 ÷ 1,000 = _____



24 ÷ 2 = 12

2.4 ÷ 2 = 1.2

0.24 ÷ 2 = 0.12

I know that _____ ÷ _____ is _____, so I also know that _____ ÷ _____ is _____

If _____ ones divided by _____ is equal to _____, then _____ tenths/hundredths divided by _____ is equal to _____