

Multiplication

Year 1

Basic to subject specific (Beck's Tiers):

Ones, groups, lots of, doubling, repeated addition, groups of, lots of, times, columns, rows, longer, bigger, higher etc, times as (big, long, wide ...etc)



Generalisations

Understand 6 counters can be arranged as 3+3 or 2+2+2
Understand that when counting in twos, the numbers are always even.

Some Key Questions

Why is an even number an even number?
What do you notice?
What's the same? What's different?
Can you convince me?
How do you know?

Year 2

Basic to subject specific (Beck's Tiers):

multiple, multiplication array, multiplication tables / facts
equal groups of, lots of, times, columns, rows, factors, products, times as many,



Generalisation

Commutative law shown on array (video)
Repeated addition can be shown mentally on a number line
Inverse relationship between multiplication and division. Use an array to explore how numbers can be organised into groups.

Some Key Questions

What do you notice?
What's the same? What's different?
Can you convince me?
How do you know?

NC2014:

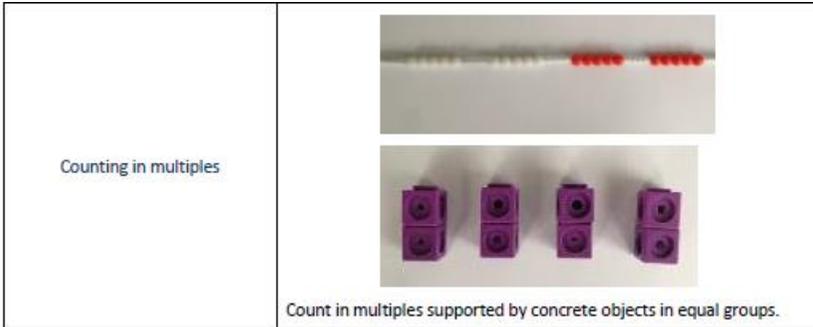
Count in multiples of twos, fives and tens
Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

NC 2014:

Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs.
Show that multiplication of two numbers can be done in any order (commutative) and division

Mental Strategies

Children should experience [regular counting](#) on and back from different numbers in 1s and in multiples of 2, 5 and 10. Concrete, pictorial and abstract to build mental strategies.



Count in multiples of a number aloud.

Write sequences with multiples of numbers.

2, 4, 6, 8, 10

5, 10, 15, 20, 25, 30

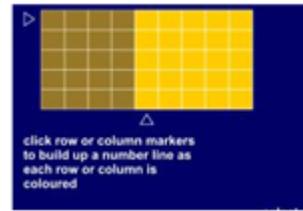
Use a number line or pictures to continue support in counting in multiples.

Counting in multiples needs to take place regularly using the concrete, pictorial and abstract to build conceptual understanding.

Repeated addition. Concrete, pictorial and abstract.
Grouping is a random arrangement of a quantity into equal groups.

Mental Strategies

Children should count regularly, on and back, in steps of 2, 3, 5 and 10, including recognising odd and even numbers within the table facts, e.g $3 \times 7 = 21$, $0 \times 0 = 0$



In the example above with 5 rows and 9 columns, when you select to count along the columns the given calculation is:
 $5 \times 9 = 45$ [the 5 is multiplied by 9].
 Selecting to count along rows gives:
 $9 \times 5 = 45$ [the 9 is multiplied by 5].

Arrays showing commutative organisation.

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

$4 \times 2 = 8$

$2 \times 4 = 8$

$2 \times 4 = 8$

$4 \times 2 = 8$

Link arrays to area of rectangles.

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

$5 + 5 + 5 = 15$

$3 + 3 + 3 + 3 + 3 = 15$

$5 \times 3 = 15$

$3 \times 5 = 15$

Arrays- showing commutative multiplication

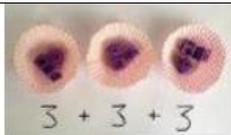
Create arrays using counters/cubes to show multiplication sentences.

It is essential that children draw the arrays in different rotations to build their conceptual understanding.

Children should practise times table facts using the commutative law

- $2 \times 1 =$
- $2 \times 2 =$
- $2 \times 3 =$

Repeated addition

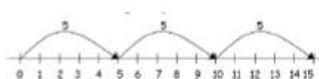


Use different objects to add equal groups.

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



2 add 2 add 2 equals 6



$5 + 5 + 5 = 15$

Write addition sentences to describe objects and pictures.



$2 + 2 + 2 + 2 + 2 = 10$

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Expressing multiplication as a number sentence using x
Using understanding of the inverse and practical resources to solve missing number problems.

$7 \times 2 = \square$ $\square = 2 \times 7$
 $7 \times \square = 14$ $14 = \square \times 7$
 $\square \times 2 = 14$ $14 = 2 \times \square$
 $\square \times \bigcirc = 14$ $14 = \square \times \bigcirc$

To understand that any number multiplied by zero will always be zero.

Use a clock face to support understanding of counting in 5s.

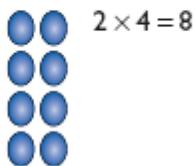
Use money to support counting in 2s, 5s, 10s, 20s, 50s

Arrays are a rectangular arrangement to show the equal groups.



$4 \times 2 = 8$

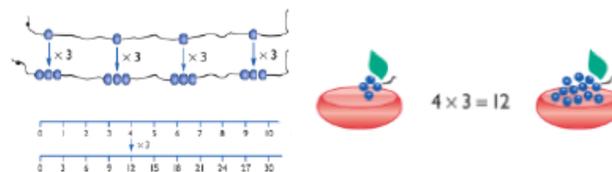
$2 \times 4 = 8$



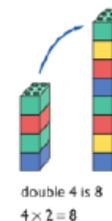
$2 \times 4 = 8$

$4 \times 2 = 8$

Begin to develop understanding of multiplication as scaling (3 times bigger/taller)



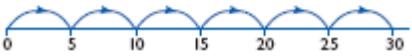
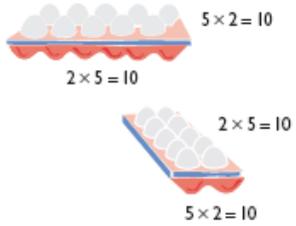
Doubling numbers up to 10 + 10
Link with understanding scaling
Using known doubles to work out double 2d numbers
(double 15 = double 10 + double 5)



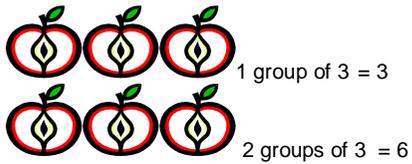
double 4 is 8
 $4 \times 2 = 8$

Counting in 2s, 5s and 10s and begin counting in 3s.

Introduce the x symbol once repeated addition is understood.



$5 + 5 + 5 + 5 + 5 + 5 = 30$
 $5 \times 6 = 30$
 5 multiplied by 6
 6 groups of 5
 6 hops of 5



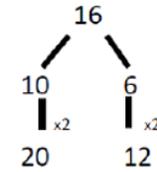
Doubles and grouping recorded on number lines

Draw pictures to show how to double a number.

Double 4 is 8



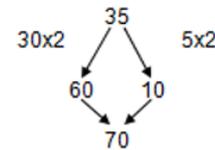
Partition a number and then double each part before recombining it back together.



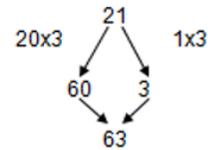
Draw pictures to show how to double a number

Partitioning strategy for doubling.

Double 35



A lolly costs 21p. How much do 3 cost?



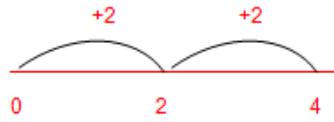
Informal recording of partitioned numbers

$15 \times 5 = 75$

$10 \times 5 = 50$

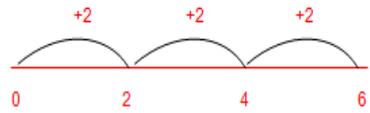
$5 \times 5 = 25$

$2 + 2 =$



Children to show notation

$2 + 2 + 2 =$



Children to show notation

$3 \times 2 = 6$

3 multiplied by 2
equals 6.

3 times 2 equals
6

Finding simple fractions of quantities.
Finding half of 10 apples.

