Calculation Policy
2020-2021
EYFS

Addition - EYFS

End of Year Expectation:
Using quantities and objects, add two single digit numbers and count on to find the correct answer.
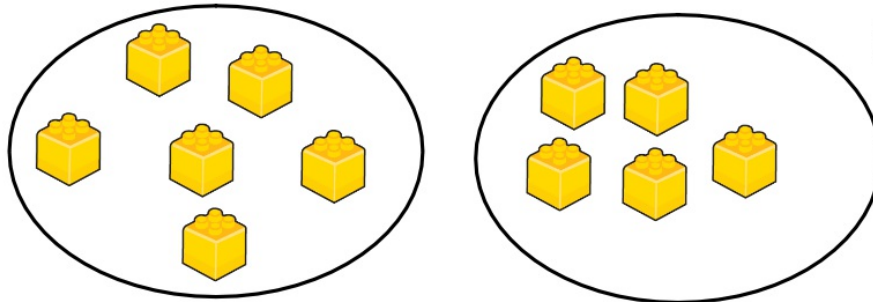Say which number is one more or onel less than a given number to 20.
Solve simple word problems involving addition and doubling.
In practical activities uses vocabulary related to addition.
Begin to record addition number sentences.
Begin to use a numberline to count on.

1 Using concrete objects and maniputlatives to support solving problems. Later pupils will draw pictures to find a solution.
6+5=11 Introduce systematic counting to ensure accuracy. Children should be able to subitise to 6 in Reception.

Build it
Draw it
Write it

5 + 0 = 5
4 + 1 = 5
3 + 2 = 5
2 + 3 = 5
1 + 4 = 5

2 Explore numbers individually to 10 e.g. the story
of 4
4 + 0 = 4
3 + 1 = 4
2 + 2 = 4
1 + 3 = 4

3 + 2 = 5

+1   +1

0 1 2 3 4 5 6 7 8 9
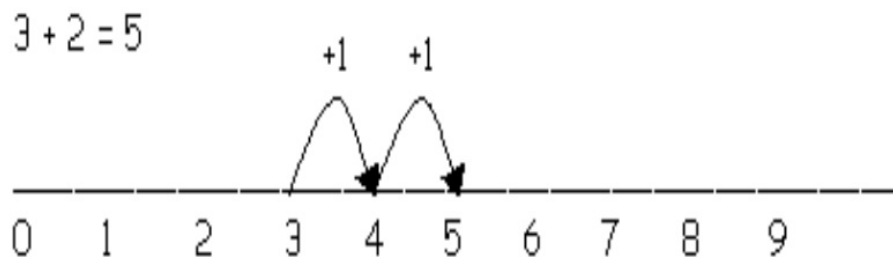
3 Add two one digit numbers using fingers, grouping together of objects in sets and then with a number line.

4 Children begin to add 3 numbers to find a total.

Children will solve a number problem with a sentence by putting the larger number first with totals of no more than ten to begin with.

Subtraction - EYFS

End of Year Expectation:
Proficiency in counting.
Using quantities and objects, subtract two single digit numbers and count back to find the correct answer.
Solve simple word problems involving subtraction and halving.
Understand that subtraction is not commutative and the largest number must come first in a calculation.

Children consolidate understanding of subtraction practically using bead strings, cubes etc and in real life contexts.

Small intervention groups. 5 minutes a day to ensure progress through these steps.
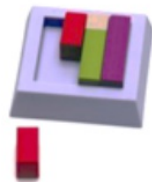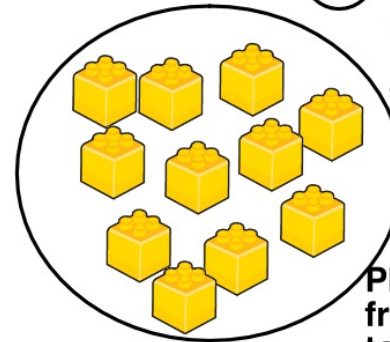
Counting:

1
- Stable order principle (number names)
- One to one principle (one number for each item)
- Cardinal principle (last number)
- Order irrelevance principle (conservation)
- Abstraction principle

The story of a number:

4

$4 - 3 = 1$
$4 - 2 = 2$
$4 - 1 = 3$
$4 - 0 = 4$

2 **Counting out a set with 1 to 1 correspondance, positioning objects for accuracy with counting.**
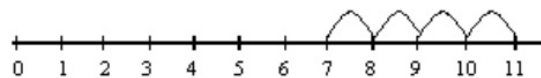
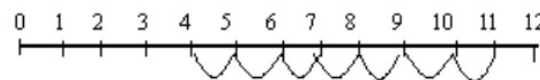**Physically subtracting 7 from the set to find a new total.**

5 **Investigating difference and then counting back on a number line.**

The difference between 7 and 11
(Counting up)

0 1 2 3 4 5 6 7 8 9 10 11

$11 - 7$
(Counting back)

0 1 2 3 4 5 6 7 8 9 10 11 12
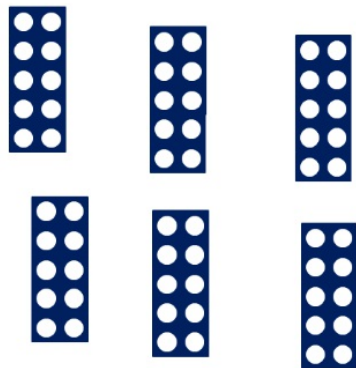
3 Using concrete objects to support
$11 - 7 = 4$
Children to write and solve subtraction sentences
within 10 using manipulatives for support and then a number line.
Progress to numbers rom 11 to 20.

Multiplication - EYFS

End of Year Expectation: (ELG)
 Solve problems including doubling

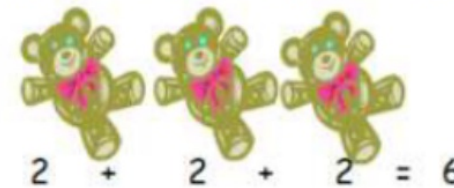**1** Investigating groups of numbers which are equal/the same.

2 Multiply with concrete objects, arrays and pictorial representations

Name _____

cookie tray arrays

My cookies are...

$\underline{3}$ x $\underline{5}$

or $\underline{5 + 5 + 5}$

I have 15 cookies!

How many legs will 3 teddies have?

2 + 2 + 2 = 6

There are 3 sweets in one bag.
How many sweets are in 5 bags altogether?

3+3+3+3+3
= 15

Multiplication - Year 1

End of Year Expectation:
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.
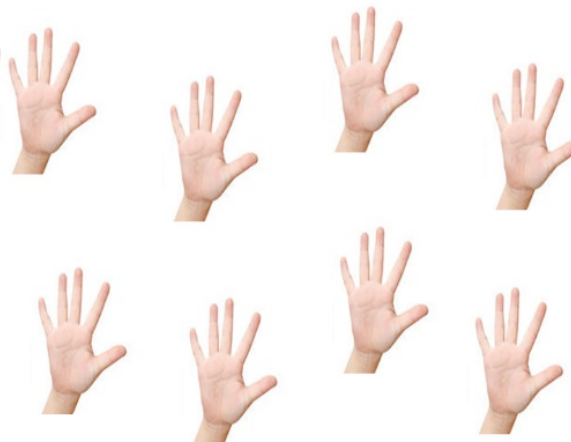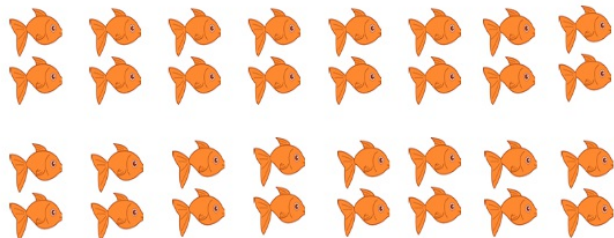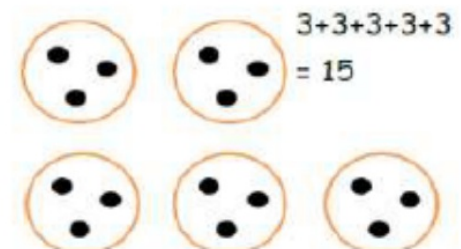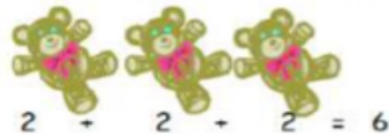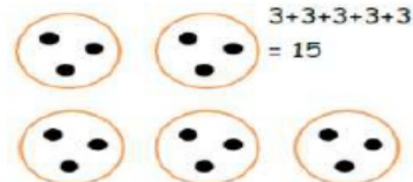
(1) Year 1 Multiply with concrete objects, arrays and pictorial representations

How many legs will 3 teddies have?

2 + 2 + 2 = 6

There are 3 sweets in one bag. How many sweets are in 5 bags altogether?

3+3+3+3+3 = 15

(2) Count in 2s, 5s, 10s

2 2 2 2 2 2 2 2 2 2
2 4 6 8 10 12 14 16 18 20
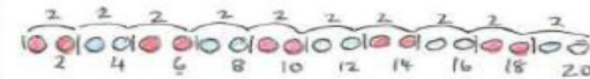
(3) Use visual and concrete arrays and 'sets of' objects to find the answers to '3 lots of 4', 2 lots of 5' etc

□ + □ = □□

□□ + □□ = [4]
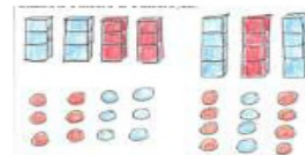
[double] + [double] = [6]

(4) Use Numicon to find doubles to double 6

my little BOOK Of aRRays

BY: _____

This is a 3x4 array.
It can also be written
4 + 4 + 4 = 12

Name _____
cookie tRay aRRays

My cookies are...
3 x 5
or _____
5 + 5 + 5

I have (15) cookies!
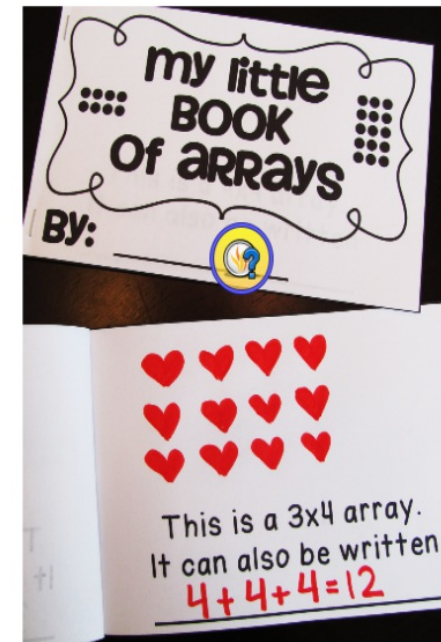
Key vocabulary - groups of, lots of, times, array, altogether, multiply, count

Multiplication - Year 2

End of Year Expectation:
Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables including odd and even numbers.
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the correct signs.
Show that multiplication of two numbers can be done in any order (commutative) and division cannot.
Solve problems involving multiplication using materials, arrays, repeated addition, mental methods and multiplication facts including problems in contexts.
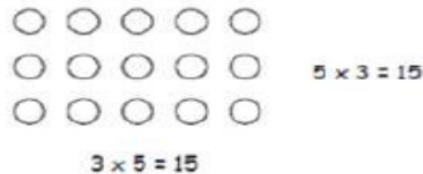
Year 2 Multiplication using arrays and repeated addition.

(using at least 2s, 5s and 10s)

Starting from zero, make equal jumps on a number line to work out multiplication facts and write multiplication

Use repeated addition on a number line:

$4 \times 5 = 20$
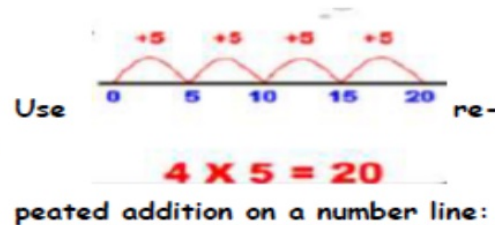
Use arrays and Numicon to help teach children to understand the commutative law of multiplication and give

$5 \times 3 = 15$

$3 \times 5 = 15$

Learn doubles to double 20

Begin to double multiples of 5 to 100

Begin to double two-digit numbers less than 50 with 1s digits of 1, 2, 3 4 or 5
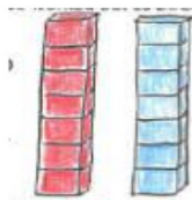
Name ____

arrays station

Directions: Draw the rectangular arrays you make. Label them.

2×10

3×5

7 × 3

5×4

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times...

Multiplication - Year 3

End of Year Expectation:
Recall and use multiplication facts for the 3's, 4's and 8's
Write and calculate mathematical statements for multiplication tables (2,3,4,5,8,10's times tables) including for two-digit numbers
times one-digit numbers using mental methods and formal written methods.
Solve problems including missing number problems involving multiplication with correspondance problems in which n objects are
connected to m objects.
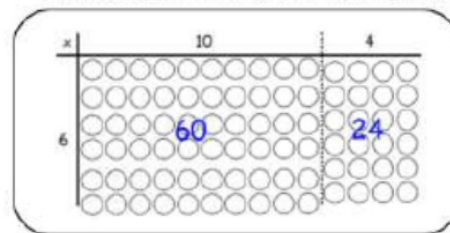
Year 3 multiply 2-digit numbers by a single digit number

Introduce the grid method for multiplying 2 digits by 1 digit

Eg. $23 \times 8 = 184$

X	20	3
8	160	24

$160 + 24 = 184$

Link the layout of the grid to an array initially:

Demonstrate how the array links to the grid calculation

Children MUST be able to do the following before moving onto grid method:

- Partition numbers into tens and units

- Multiply multiples of ten by a single digit (Smile multiplication) using their knowledge of multiplication facts and times tables.

- Recall and work out multiplication facts in the 2,3,4,5,8 and 10 times tables

Smile Multiplication
$30 \times 80 = 2400$

24

Do the tables bit,
Then make it 10, 100 or 1000 times bigger!

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value

Multiplication - Year 4

End of Year Expectation:
> Recall multiplication facts for multiplication tables up to 12 × 12
> Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.
Continue to teach the use of empty number lines, as appropriate. (Y3 guidance)

(1) Further develop the grid method for two-digit numbers multiplied by a one- digit number.

36 x 4 = 144

X	30	6
4	120	24

120 + 24 = 144 (add the partial products)

(3) This leads to short multiplication (formal method) of a two–digit number multiplied by a one- digit number:

```
  3 6    36 x 4 = 144
x   4
1 4 4
  2
```

Use the language of place value to ensure understanding. Ensure that the digit 'carried over' is written under the line in the correct column.

Continue to practise the formal method of short multiplication of a two-digit number by a one -digit number throughout Y4.

(2) Expanded short multiplication (two-digit number by a one-digit number):

36 x 4 = 144

```
    3 6
x     4
+   2 4   (4 x 6)
  1 2 0   (4 x 30)
  1 4 4
```

Include an addition symbol when adding partial products.

(4) If children are confident, continue to develop short multiplication with three- digit numbers multiplied by a one-digit number.

```
  1 2 7     127 x 6 = 762
x     6
    4 2   (6x7)
+ 1 2 0   (6x20)
  6 0 0   (6x100)
  7 6 2
```

then onto th

```
  1 2 7
x     6
  7 6 2
  1   4
```

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times…, partition, grid method, multiple, product, tens, units, value, *inverse*
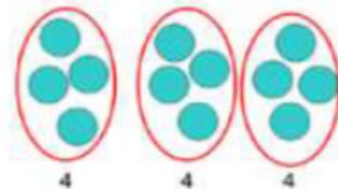
Division - EYFS

Simple Division Math Activity for Early Learners

Roll, Count and Try to Share

Cherries

Grouping:

Sharing:

12 shared between 3 is 4

Children should solve a division problem within a context.

E.g. 5 children share 15 sweets. How many does each child get?

Can they solve this and write a division statement eg. 15 sweets shared between 5 children gives 3 each.

5 sweets 5 sweets 5 sweets

4 5 6
7 8 9

①

②

12 shared between 3 equals 4.

LOLLY BAG LOLLY BAG LOLLY BAG

Old Bear has bought some marshmallows for himself and his friends. Can you count out the correct number of marshmallows and share them equally among the toys?

12 20 8
10 9 6
4 14