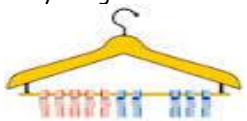
## Reception Addition

### Combining / re-combining / partitioning

Relate addition to combining **2** groups of objects and then **3** groups of objects by counting all.

E.g. Count out **4** cakes, count out **3** cakes. How many altogether? Count all cakes.



7 + 3 = 10  3 + 7 = 10

ANY ORDER  10 = 7 + 3  7 + 3 = 10

### Counting on

From understanding conservation of number lead on to counting on (seen and unseen).

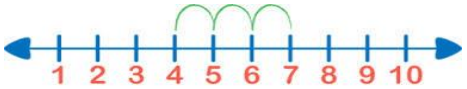
E.g. Count **5** objects into a cloth bag. How many objects in the bag? Count **2** more objects into the bag. How many objects in the bag now?

' Five add two makes 7'  5 + 2 = 7

### Number lines

Teachers demonstrate use of a number line, then children use number lines to support their own calculations.

4 + 3 = 7




### Doubles and Commutative law

Relate understanding of counting on to **2** groups of equal size – doubles

5 + 5  10  Double 5 is 10

10 - 5 = 5  Half of 10 is 5

### Learn to record

## Reception Subtraction

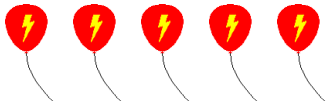
### Counting back on fingers, orally, number lines.

Written number tracks to record and physical moves on large number track eg, from **5**, jump back **3** to **2**

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | |
|---|---|---|---|---|---|---|---|---|

### Practical demonstrations of taking away

We had **5** balloons, we lost **2**.



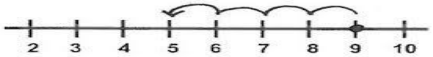
*'Five take away two is three'.*

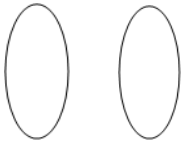
5 – 3 = 2 (modelled by T)

Know that the number gets smaller, because objects have been removed from the set.

### Find the difference

Count on or back, horizontally or vertically, eg. 9 – 4 = 5



9  4

Use the language of fewer than.

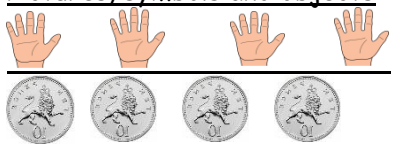
### Using known number facts

6 + ? = 10  4 + ? = 10

10 - ? = 4  10 - ? = 6

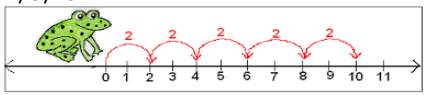
## Reception Multiplication

### Pictures, symbols and objects



### Jumping

along number lines in jumps of 1, 2, 5, 10




### Repeated addition

eg **2 + 2 + 2** or **3** lots/groups/sets of **2**

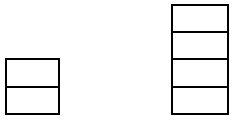
**2 × 3** (**2** three times)

(**2** multiplied by **3**) (**3** groups of **2**)

Children represent practically and pictorially using verbal/ written description

### Doubling and halving

Use the bricks to make a tower double the height of this one .....



**6** pairs of socks are washed. How many socks altogether?

### Grouping

a random arrangement of a quantity of objects into equal groups.

### Arrays

a rectangular arrangement to show equal groups.

Show that X is commutative, use pegboards or numicon.

## Reception Division

### Sharing

Put 6 ladybirds on 2 leaves so that each leaf has the same number of ladybirds. **(6 ÷ 2 = 3)**  **6** ladybirds shared between **2** leaves.

### Grouping

(repeated subtraction of equal groups)

There are **6** sweets. How many children can have **2** each?

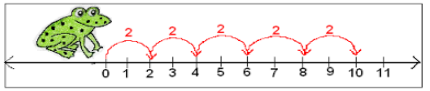
**3** children

How many cars can you make if you have 8 wheels?

Children represent practically and pictorially using verbal/ written description

### Counting

back on number lines in jumps of 1, 2, 5, 10




### Sharing equally and halving

Eg fruit at snack time

## Year One Addition

+ = signs and missing numbers

3 + 4 = □ □ = 3 + 4

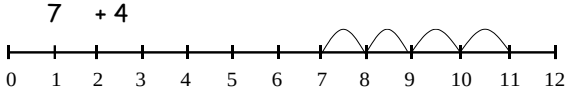
3 + □ = 7 7 = □ + 4

□ + 4 = 7 7 = 3 + □

□ + ∇ = 7 7 = □ + ∇

= SIGN can be in a different place within a calculation. It means 'the same as'.

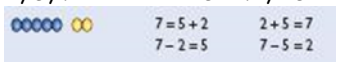
Number lines (numbered)




Recording by - drawing forward jumps on prepared lines , -constructing own lines ( Teacher model number lines with missing numbers, Teacher model jottings appropriate for larger numbers) Teacher model number sentence recording too.

Fact Families

2, 5, 7 2 + 5 = 7 , 5 + 2 = 7 , 7 – 5 = 2 , 7 – 2 = 5.




Using Useful facts

Looking for facts or bonds that are useful, e.g. bonds up to and including 10, doubles or adding 10 to a given number.

Number bonds **6** + 3 + **4** = 13 **(10)**

**6** + **3** + **4** + **7** + 2 = 22 **(10)**

Compensation 5 + 9 =

5 + 10 – 1 (draw on a number line)

Doubles 5 + 6 =

5 + 5 + 1 = 11

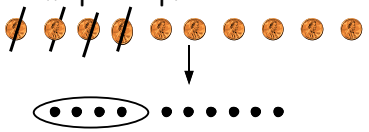
Adding 2 2 digit numbers

Adding 3 numbers together

## Year One Subtraction

Pictures / marks

Sam spent 4p. What was his change from 10p?



- = signs and missing numbers

7 - 3 = □ □ = 7 - 3

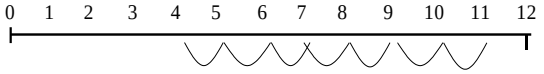
7 - □ = 4 4 = □ - 3

□ - 3 = 4 4 = 7 - □

□ - ∇ = 4 4 = □ - ∇

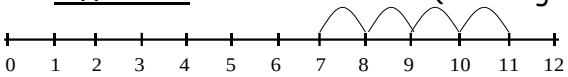
Number lines (numbered) Counting back

11 – 7




**WHEN** using a number line, begin to consider breaking numbers up when they bridge a 10 or a 5, eg 15 – 8 = ( 15 – 3 – 5 = )

The **difference** between 7 and 11 (Counting up)




Recording by - drawing jumps on prepared lines, - constructing own lines (Teachers model jottings appropriate for larger numbers). Teacher model number sentence recording too.

Patterns

Use patterns to find answers to subtractions, e,g

10 + 4 = 10 – 4 = 20 + 4 = 20 – 4 =

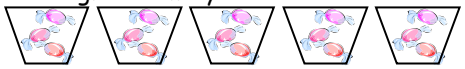
(Fact Families) Use subtraction as the inverse to check + calculations.

Subtracting 2 2 digit numbers

## Year One Multiplication

Pictures and symbols

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



*(Recording on a number line as REPEATED ADDITION modelled by the teacher when solving problems)*

EXPERIMENT with grouping an amount in different ways.

**5** added together **3** times **TIMES TABLES LINK**

5 5 5

0 1 2 3 4 5 6 7 8 9 10 11 12 13

is **5** + **5** + **5** or
**3** groups of **5** or
**3** times **5** or
**5** x **3** (or **3** x **5**) or
**5** multiplied by **3**


1 group of 3

2 groups of 3

Use of bead strings to model groups of.

**ARRAYS** Before introducing the symbol "**x**", give children experience of arrays so that they know that it doesn't matter which order the symbols are in the NUMERICAL value is the same (commonality). **NUMICON**

**4 x 2 = 8**

**2 x 4 = 8**

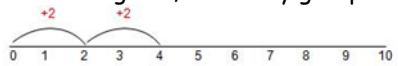
## Year One Division

Pictures / marks

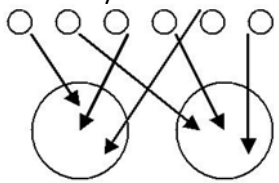
12 children get into teams of 4 to play a game. How many teams are there?

12 ÷ 4=

If I have got 4, how many groups of 2 have I got?




There are 6 cakes and 2 children. How many cakes will they each get?
'One for you and one for you'.



Use pictorial notation and then, move on to formal recording with ÷

REMAINDERS

Problems...

5 hops in 15. How big is each hop? (Use a number line). (EQUALjumps)

There are 20 sweets in a bag, how many children can have 5 each?


*Record on a number line as REPEATED SUBTRACTION).*

How many groups of 5 are there in 20?

## Year Two Addition

<u>+ = signs and missing numbers</u>

Continue using a range of equations as in Year 1 but with appropriate, larger numbers.

Extend to

14 + 5 = 10 + □

and adding three numbers

32 + □ + □ = 100  35 = 1 + □ + 5

<u>Partition into tens and ones and recombine</u>

Record partitioned steps in number sentences underneath each other and add mentally.

12 + 23 = 10 + 2 + 20 + 3

= 30 + 5

= 35

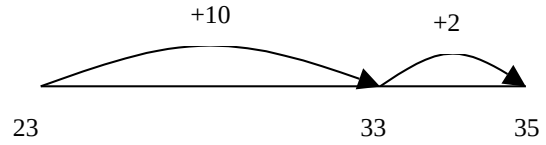
Introduce column addition without crossing the boundary.

Refine to partitioning the second number only:

23 + 12 = 23 + 10 + 2

= 33 + 2

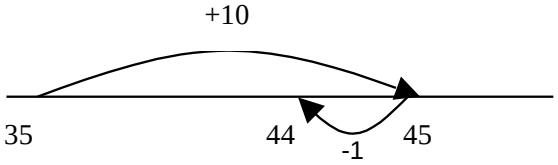
= 35




Bridge 10 whenever possible.

Add 9 or 11 by adding 10 and adjusting by 1

35 + 9 = 44




Use of near doubles.

13 + 14 = _  Double 14 = 28……..28-1=27

Or double 13=26….26+1 =27

## Year Two Subtraction

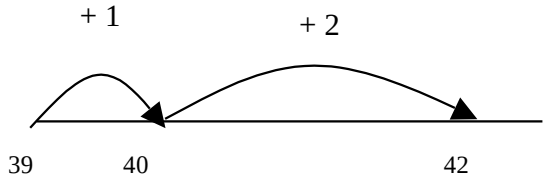
<u>- = signs and missing numbers</u>

Continue using a range of equations as in Year 1 but with appropriate numbers.

Extend to 14 + 5 = 20 - □

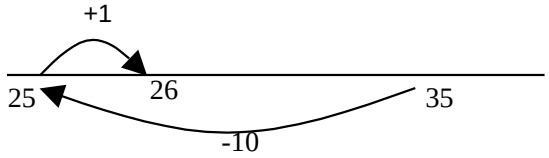
Find a small difference by counting up

42 – 39 = 3




Subtract 9 or 11. Begin to add/subtract 19 or 21

35 – 9 = 26

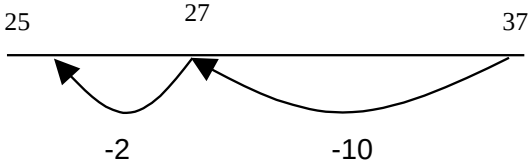



<u>Use known number facts and place value to subtract</u> (partition second number only strategy)

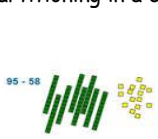
37 – 12 = 37 – 10 – 2

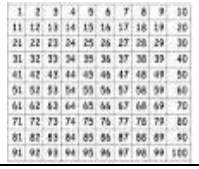
= 27 – 2

= 25




This can work alongside dienes, numicon, 100 squares or bead strings as a resource, to see the partitioning in a different way.



## Year Two Multiplication

x = signs and missing numbers

7 x 2 = □ □ = 2 x 7 □ x 2 = 14 14 = 2 x □

□ x ∇ = 14 14 = □ x ∇ 7 x □ = 14 14 = □ x 7

**Pictorial multiplication:**

E.g. – 3 x 3 = 9

**Arrays:**

**2 x 3 = 6** **3 x 2 = 6**

**Partition:**

**15 x 2 =** **10 x 2 = 20**
**5 x 2 = 10**
**20 + 10 = 30**

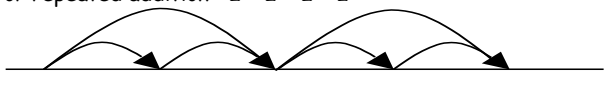
| x | 10 | 5 |
|---|---|---|
| 2 | 20 | 10 |

**15 x 2 = 30**

Arrays and repeated addition

● ● ● ● ● 4 x
2 or 4 + 4
● ● ● ● ●
2 x 4

or repeated addition 2 + 2 + 2 + 2




Partition 15 x 2 = 30

OR

| x | 10 | 5 |
|---|---|---|
| 2 | 20 | 10 |

15 x 2
20 + 10 = 30

*Understand **5 x 8 = 8 x 5** *Understand **16 ÷ 2** does not equal **2 ÷ 16**

*Understand: that digits of a number shift one place to the left to multiply by 10 – don't teach *"just add a nought"!* *Use knowledge of doubles and halves to multiply/divide

*Say or write division statement corresponding to a given multiplication statement

## Year Two Division

÷ = signs and missing numbers

6 ÷ 2 = □ □ = 6 ÷ 2

6 ÷ □ = 3 3 = 6 ÷ □

□ ÷ 2 = 3 3 = □ ÷ 2

□ ÷ ∇ = 3 3 = □ ÷ ∇

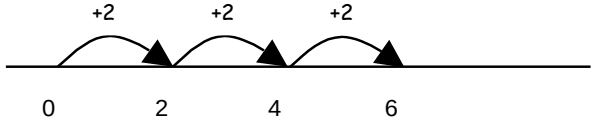
Understand division as sharing and grouping

Sharing – 6 sweets are shared between 2 people. How many do they have each?

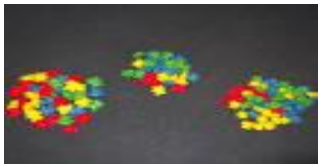
6 ÷ 2 can be modelled as:

Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?)

(repeated addition)




Use of practical resources to give concrete experience, eg



*Understand that dividing by 2 is the same as halving.