

# ADDITION +

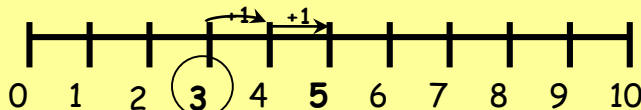
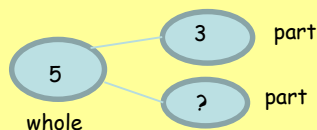
End of  
Year 1  
Expectations

Counting everyday objects as often as possible. Counters, pasta pieces or anything else you can find, e.g.

$$\bullet + \bullet = \bullet \quad 3 + 2 = 5$$

Then jumps on a number line, e.g.  $3 + 2 = 5$   
Then switch it  $2 + 3 = 5$   
 $5 = 3 + 2$

Understanding missing parts:



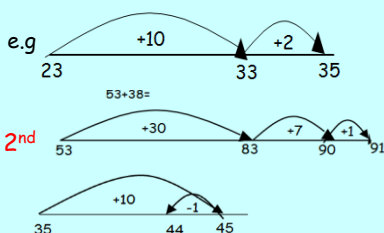
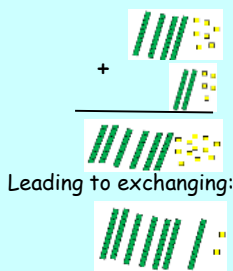
End of  
Year 2  
Expectations

Jumps on a number line by partitioning a 2 digit number,

3<sup>rd</sup>

Expanded written method:

1<sup>st</sup>



$$\begin{array}{r} + 47 \\ 25 \\ \hline 12 \\ 60 \\ \hline 72 \end{array}$$

Leading to exchanging:

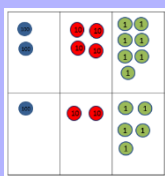
Adding 9 or 11 using jumps on a number line, then adjusting e.g.  $35 + 9 = 44$

End of  
Year 3  
Expectations

Place value counters or dienes can be used.

Without counters or dienes:

1<sup>st</sup>



$$\begin{array}{r} 247 \\ + 125 \\ \hline 12 \\ 60 \\ 300 \\ \hline 372 \end{array}$$

2<sup>nd</sup>

$$\begin{array}{r} 247 \\ + 125 \\ \hline 12 \\ 60 \\ 300 \\ \hline 372 \end{array}$$

If secure, then:

$$\begin{array}{r} 247 \\ 125 \\ \hline 372 \\ 1 \end{array}$$

Place value counters or dienes can be used.

End of  
Year 4/5  
Expectations

Column method, leading on to adding decimals

$$72.8 + 54.6 = 127.4$$

1<sup>st</sup>

$$\begin{array}{r} 367 \\ + 185 \\ \hline 552 \\ 11 \end{array}$$

2<sup>nd</sup>

$$\begin{array}{r} 72.8 \\ + 54.6 \\ \hline 127.4 \\ 1 \quad 1 \end{array}$$

$$367 + 185 = 552$$

End of  
Year 6  
Expectations

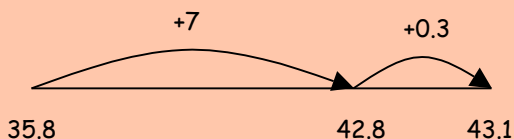
Number line

or

column method using complex decimal numbers

$$35.8 + 7.3 = 43.1$$

$$13.86 + 9.481 = 23.341$$



$$\begin{array}{r} 13.86 \\ + 9.481 \\ \hline 23.341 \\ 1 \quad 1 \quad 1 \end{array}$$

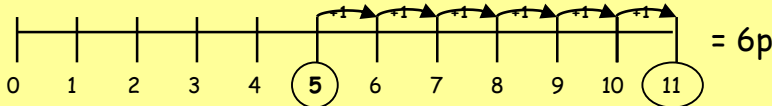
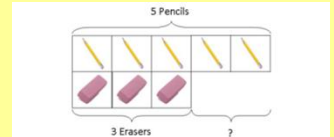
# SUBTRACTION -

End of  
Year 1  
Expectations

Taking away everyday objects as often as possible. Counters, pasta pieces or anything else you can find, e.g.

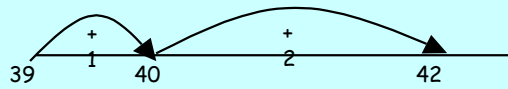
$$\text{●} \text{●} \text{●} - \text{●} \text{●} = \text{●} \quad 3 - 2 = 1$$

Using a number line to find the difference, e.g. I have saved 5p the socks I want cost 11p. How much more money do I need?

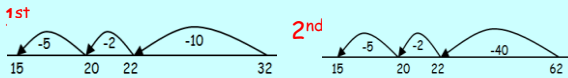


End of  
Year 2  
Expectations

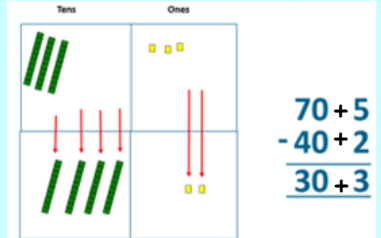
Using a number line to find a small difference, e.g.  $42 - 39 = 3$



Use a number line and partition numbers to subtract, counting backwards, e.g.  $32 - 17 = 15$



Towards written methods:  
Recording subtraction in expanded columns. The numbers may be represented with Dienes apparatus. E.g.  $75 - 42$



End of  
Year 3  
Expectations

Using the expanded layout based on partitioning.

$$58 - 32 = 26$$

$$72 - 47 = 25$$

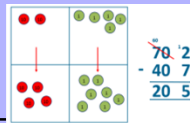
$$362 - 148 = 214$$

1st

$$\begin{array}{r} 50 + 8 \\ - 30 + 2 \\ \hline 20 + 6 = 26 \end{array}$$

2nd

$$\begin{array}{r} 60 \\ 70 + 12 \\ - 40 + 7 \\ \hline 20 + 5 = 25 \end{array}$$



3rd

$$\begin{array}{r} 50 \\ 300 + 60 + 2 \\ - 100 + 40 + 8 \\ \hline 200 + 10 + 4 = 214 \end{array}$$

If secure then formal method (see Year 4)

End of  
Year 4/5  
Expectations

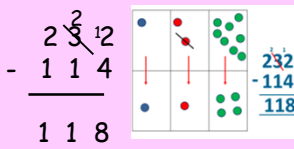
To use the compact method, including decimal numbers and 4/5 digit numbers, e.g.

1st

$$232 - 114 = 118$$

2nd

$$4362 - 3148 = 1214$$



$$\begin{array}{r} 4362 \\ - 3148 \\ \hline 1214 \end{array}$$

End of  
Year 6  
Expectations

As previously, but using decimal numbers with a mixed number of decimal places, e.g.  $0.5 - 0.31 = 0.19$

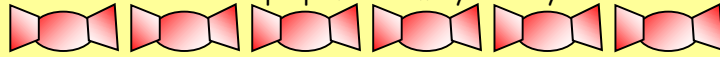
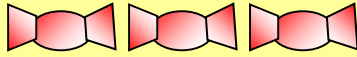
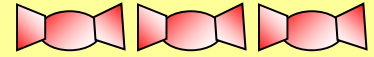
$$\begin{array}{r} 0.50 \\ - 0.31 \\ \hline 0.19 \end{array}$$

Tip! Encourage children to turn decimals with one decimal place into money, e.g. 0.5 becomes 0.50 (50p). If working out change from pounds, children should count on using a number line.

# DIVISION ÷

End of  
Year 1  
Expectati  
ons

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



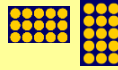
Grouping. Children sort objects into 2s, 3s, 4s, etc. For example, how many pairs of socks are there?



Use of arrays as a pictorial representation for division.

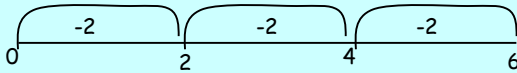
$15 \div 3 = 5$  There are 5 groups of 3.

$15 \div 5 = 3$  There are 3 groups of 5.



End of  
Year 2  
Expectati  
ons

Repeated subtraction using a number line, e.g.  $6 \div 2 = 3$



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



End of  
Year 3/4  
Expectati  
ons

To use the chunking method first in single chunks, then in larger chunks:

1<sup>st</sup>

$$\begin{array}{r} 3 \overline{) 24} \\ - 15 \quad (3 \times 5) \\ \hline 9 \\ - 9 \quad (3 \times 3) \\ \hline 0 \end{array}$$

2<sup>nd</sup>

$$\begin{array}{r} 3 \overline{) 61} \\ - 30 \quad (3 \times 10) \\ \hline 31 \\ - 30 \quad (3 \times 10) \\ \hline 1 \end{array}$$

3<sup>rd</sup>

$$\begin{array}{r} 24 \overline{) 1328} \\ - 960 \quad (24 \times 40) \\ \hline 368 \\ - 240 \quad (24 \times 10) \\ \hline 128 \\ - 120 \quad (24 \times 5) \\ \hline 8 \end{array}$$

55 r8

End of  
Year 5  
Expectati  
ons

To use long division:

$$\begin{array}{r} 017 \\ 25 \overline{) 425} \\ - 0 \downarrow \\ \hline 42 \\ - 25 \downarrow \\ \hline 175 \\ - 175 \\ \hline 000 \end{array}$$

If secure  
then  
short  
division  
see Year  
6)

End of  
Year 6  
Expectati  
ons

To use short division. To turn remainders into decimals. To begin dividing decimals:

1<sup>st</sup>

$$\begin{array}{r} 18 \\ 3 \overline{) 54} \end{array}$$

2<sup>nd</sup>

$$\begin{array}{r} 23 \text{ r}2 \\ 4 \overline{) 914} \end{array}$$

3<sup>rd</sup>

$$\begin{array}{r} 1.3 \\ 7 \overline{) 9.1} \end{array}$$

then...

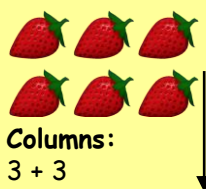
$$6.625 \div 0.53$$

Moving on to remainders  
being represented as decimals  
.5 or fractions.

# MULTIPLICATION X

End of  
Year 1  
Expectations

Counting groups of the same size.



Rows:  
 $2 + 2 + 2$   
3 groups of 2  
 $3 \times 2 = 6$

Columns:  
 $3 + 3$   
2 groups of 3  
 $2 \times 3$

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



Use arrays to understand multiplication can be done in any order (commutative)

Rows:  
 $2 + 2 + 2 + 2 = 8$   
 $4 \times 2 = 8$   
Columns:  
 $4 + 4 = 8$   
 $2 \times 4 = 8$

End of  
Year 2  
Expectations

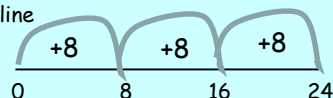
Children use arrays and repeated addition:

1<sup>st</sup>

Rows:  
 $2 + 2 + 2 + 2 = 8$   
 $4 \times 2 = 8$   
Columns:  
 $4 + 4 = 8$   
 $2 \times 4 = 8$

2<sup>nd</sup> Multiplying on a number line

$$3 \times 8 = 24$$



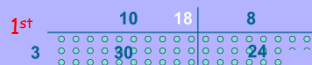
3<sup>rd</sup>

Then move on to the grid method multiplying a 2 digit number, e.g.  $2 \times 15 = 30$

$$\begin{array}{r|rr} \times & 10 & 5 \\ 2 & 20 & 10 \\ \hline & 20 & 10 \\ & = 30 \end{array}$$

End of  
Year 3/4  
Expectations

Grid method- When working out  $7 \times 20$  encourage children to think in patterns, i.e.  $7 \times 2 = 14$ ,  $7 \times 20 = 140$



$$\begin{array}{r|rr} \times & 10 & 8 \\ 3 & 30 & 24 \\ \hline \end{array}$$

2<sup>nd</sup>

$$\begin{array}{r|rrr} \times & 100 & 20 & 2 \\ 7 & 700 & 140 & 14 \\ \hline \end{array}$$

Year 4 (When secure with the grid method)

1<sup>st</sup>

$$\begin{array}{r} 324 \\ \times 6 \\ \hline 24 \quad (6 \times 4) \\ 120 \quad (6 \times 20) \\ 1800 \quad (6 \times 300) \\ \hline 1944 \end{array}$$

2<sup>nd</sup>

|   |   |   |   |
|---|---|---|---|
|   | 3 | 2 | 4 |
|   | x |   | 6 |
| 1 | 9 | 4 | 4 |
|   | 1 | 2 |   |

End of  
Year 5  
Expectations

Column method:

1<sup>st</sup>

$$\begin{array}{r} 15 \\ \times 7 \\ \hline 105 \end{array}$$

2<sup>nd</sup>

$$\begin{array}{r} 15 \\ \times 12 \\ \hline 150 \\ 30 \\ \hline 180 \end{array}$$

3<sup>rd</sup>

$$\begin{array}{r} 372 \\ \times 74 \\ \hline 26040 \\ 51 \\ \hline 1488 \\ 2 \\ \hline 27528 \end{array}$$

Encourage pattern spotting with your child, e.g.  $6 \times 3 = 18$  so  $6 \times 0.3 = 1.8$

End of  
Year 6  
Expectations

Column method:  $4325 \times 23 = 99,475$ .

Children can use the formal method to multiply decimals with 2 or more decimal places, e.g.  $7.34 \times 6 =$

So do  $734 \times 6 = 4404$   
 $7.34 \times 6 = 44.04$

Then make 100 times smaller.

Check: There are two digits after the decimal place in the number sentence so the product also has to have two digits after the decimal point.