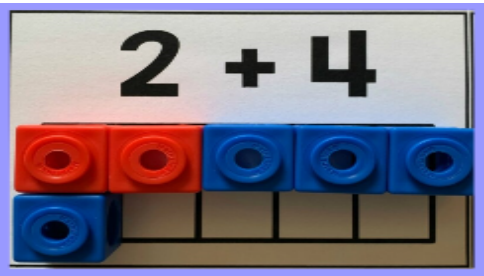
A GUIDE TO MATHS AT KINGSNORTH

Within this powerpoint, I will try to show you some of the methods we teach and in what year groups they are taught. I will hopefully also go over how to teach other areas of the curriculum as these are areas we know may be slightly more difficult.

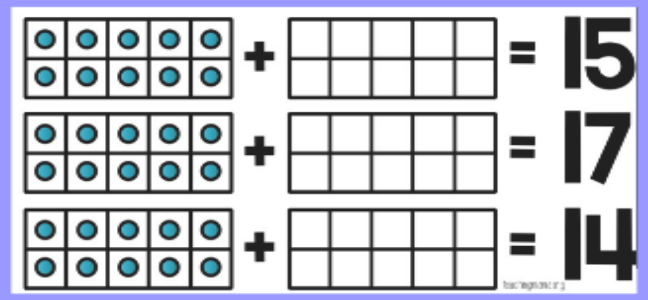
We know that the way we (parents and teachers) were taught is different to what we see now and so hopefully, I can provide you with the methods all on one page.

The main thing you can do with your children is to make sure they know their times tables. This is the most important knowledge you can give your children as it underpins most of the Maths curriculum as they move through the school. This can be taught by singing songs, TT Rockstars (year 2-6) or www.timestables.co.uk.



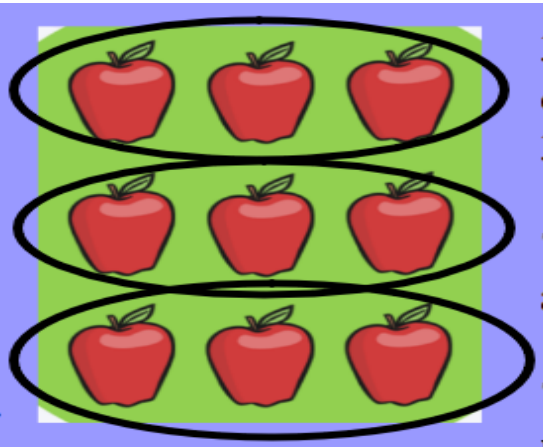
TENS FRAME

As you'll see below, a ten frame is a two-by-five rectangular frame into which counters are placed to demonstrate numbers less than or equal to 10. Counters can be arranged in different ways to represent different numbers, which visually help your children develop strong number sense.



ARRAY

An array in maths is an arrangement of objects, numbers or pictures in columns or rows. The purpose of an array is to help children understand multiplication and division.



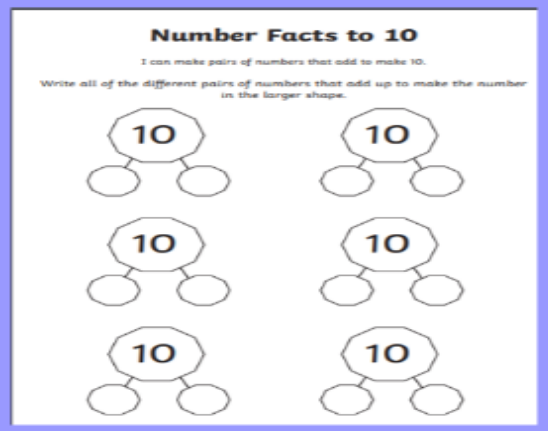
3 x 3 = 9
or use repeated addition
3 + 3 + 3 = 9

There are 3 groups of 3 apples.

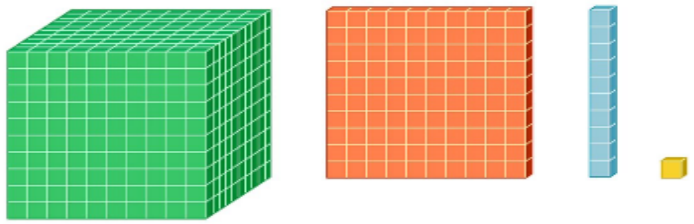
This also works when using division as I can do
9 ÷ 3 = 3

YEAR 1

PART-WHOLE



The Part-whole reasoning or model is the concept of how numbers can be split into parts. Children using this model will see the relationship between the whole number and the component parts, this helps learners make the connections between addition and subtraction. This can be linked to bar models by placing the values next to each other.



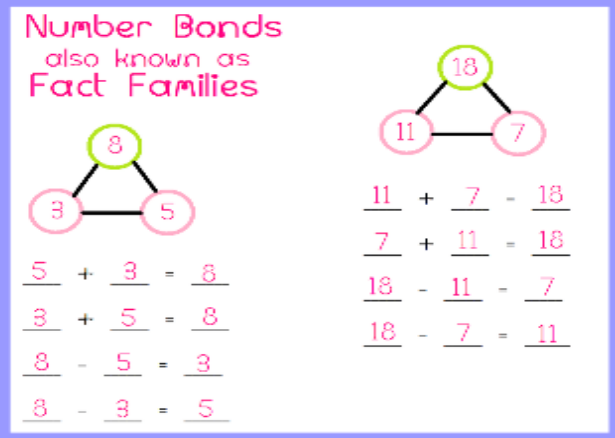
Base Ten Blocks

This is a way of putting a place value to numbers. In base 10, each digit in a position of a number can have an integer value ranging from 0 to 9 (10 possibilities). This system uses 10 as its base number, so that is why it is called the base-10 system. Base-10 blocks are used to help children to experiment with basic addition and subtraction within the realms of base-10.

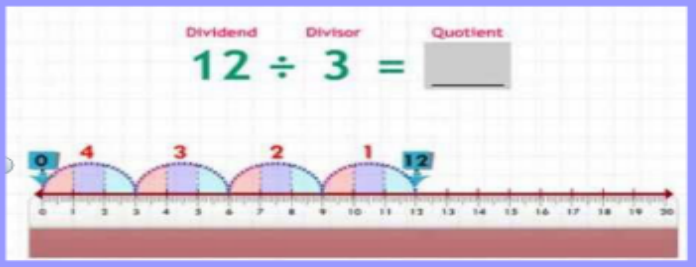
FACT FAMILIES/number families

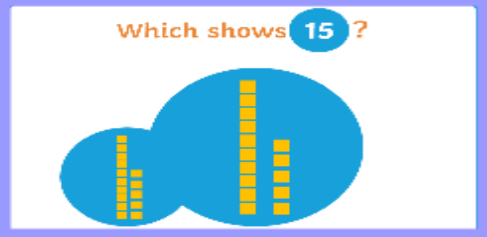
Recognising fact families is an important number concept where children can recognise inverse operations such as 3 + 5 = 8 and 8 - 3 = 5.

YEAR 2

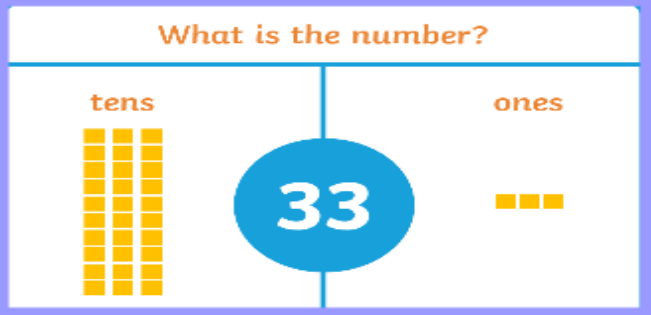


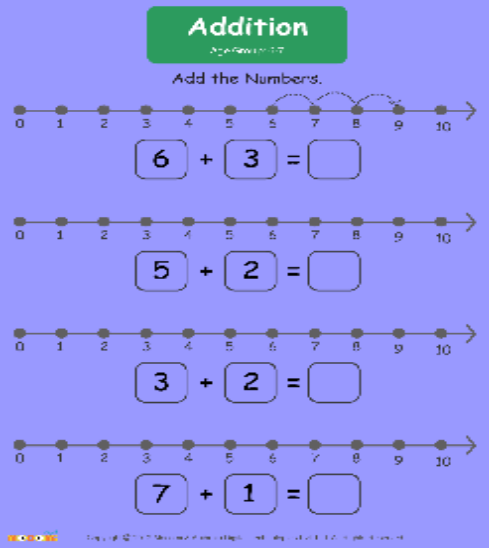
Number lines with the four operations



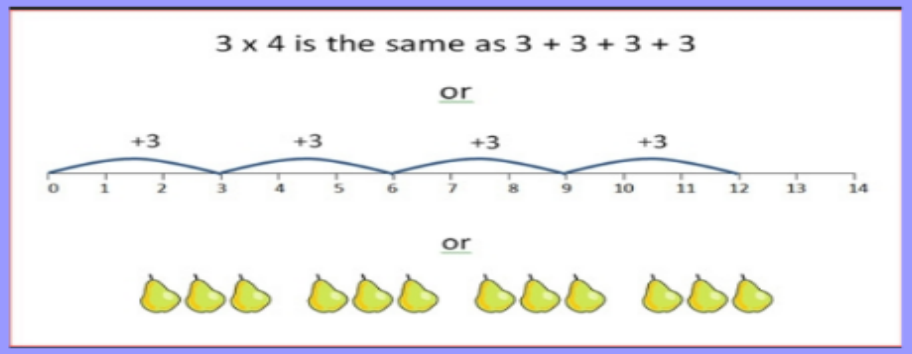


What is the value of the 3 in 34?
30

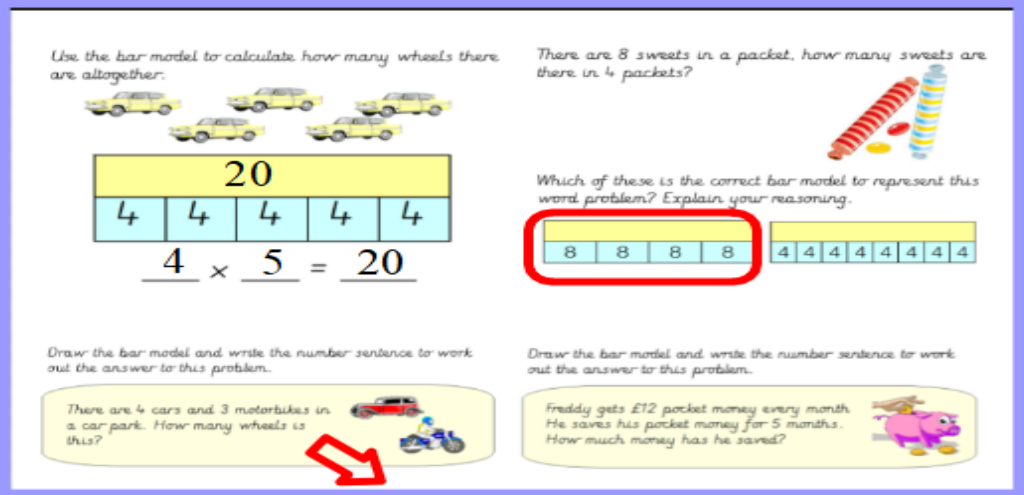


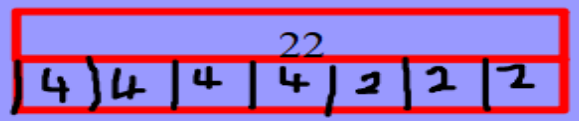


Number Lines let students show repeated addition or jumps when answering multiplication/division questions or when doing addition/subtraction. Always placing the biggest number first and counting on.



BAR MODELS linked to four operations

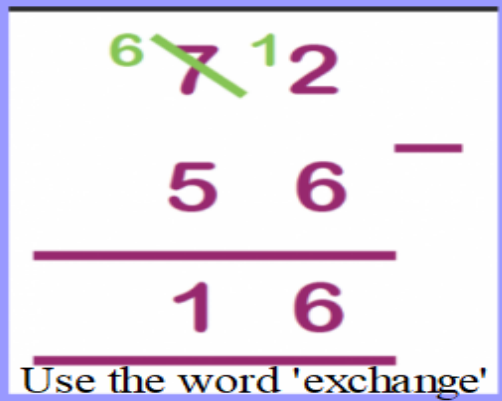


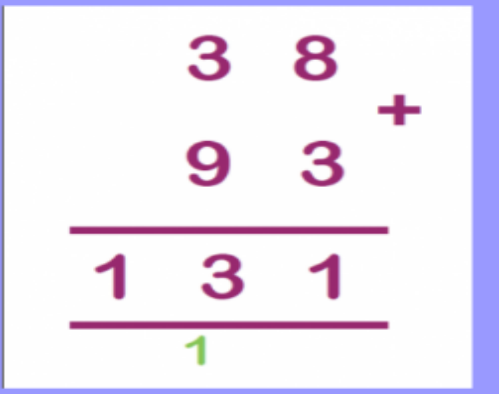


If your child struggles with a method, go to the previous year group and build up to these methods. The aim is to build their confidence to get to the most efficient method.

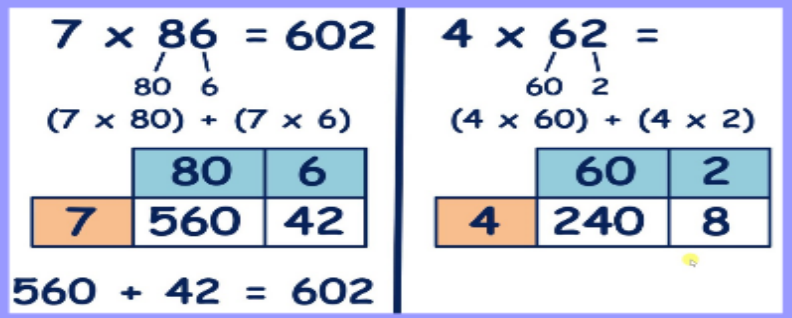
YEAR 3

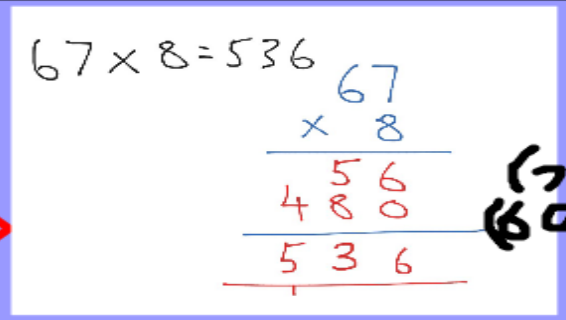
COLUMN ADDITION AND SUBTRACTION

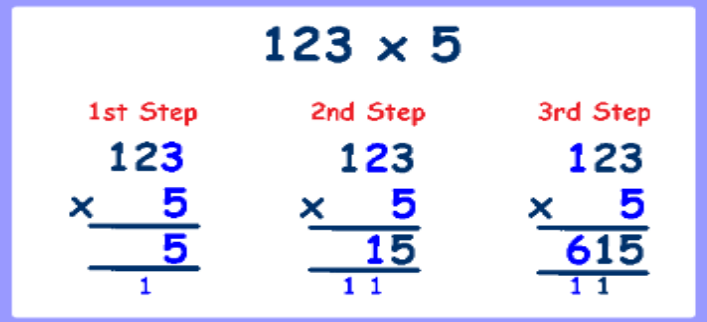




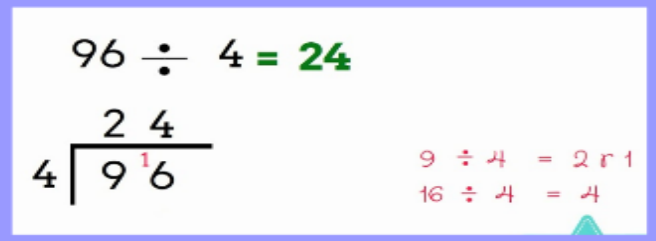
MULTIPLICATION: Grid method to expanded method on to short method







DIVISION: SHORT METHOD (Bus stop)



MULTIPLY BY 10, 100 and 1000

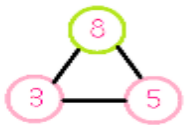
H	T	O
	2	1
2	1	0

Move the digits. If it is 10, link to the fact 10 has one zero so we move it 1 space. If it is 100, there are 2 zeros so 2 spaces and so on. Multiplication the digits move up the place value and division they move down. Remember the decimal point does not move and remains next to 'ones' or 'units'

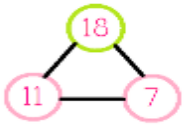
YEAR 4

Fact Families

Number Bonds
also known as
Fact Families

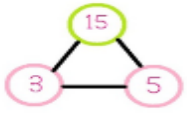


5 + 3 = 8
3 + 5 = 8
8 - 5 = 3
8 - 3 = 5



11 + 7 = 18
7 + 11 = 18
18 - 11 = 7
18 - 7 = 11

Number Bonds
also known as
Fact Families



5 × 3 = 15
3 × 5 = 15
15 ÷ 5 = 3
15 ÷ 3 = 5

11 × 7 = 77
7 × 11 = 77
77 ÷ 11 = 7
77 ÷ 7 = 11

In year 4 reasoning, get the children to underline the important information and circle the word that tells them what operation to do. Answer each sentence as some questions will be two steps. Use your written methods to show your calculations.

MULTIPLICATION

Now take out grid method and concentrate on expanded moving to short method.
SEE YEAR 3 for previous methods.

```
  23
 x12
 ---
   6
  40
  30
 200
 ---
 276
```

2 x 3
2 x 20
10 x 3
10 x 20

Product means multiply

```
  23
 x12
 ---
  46
+230
 ---
 276
```

DIVISION

96 ÷ 4 = 24

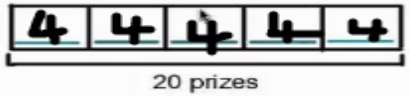
```
  24
 ----
4|96
```

9 ÷ 4 = 2 r 1
16 ÷ 4 = 4

Miss Howard has 20 prizes and must share them between the 5 classes. How many prizes does each class get?

A bar model can show how the parts of a problem are related.

- Complete the bar model to show 20 prizes divided into 5 equal groups.



Sum means add

SUBTRACTION AND ADDITION

Column method

```
  5 6 7
+ 1 9 9
 -------
  7 6 6
```

Children can place the exchange above or below the line.

```
 567
+199
 ---
 766
```

All children should know multplication facts up to 12 x 12

YEAR 5

Multiplying Decimals by 10, 100 or 1000

When multiplying a decimal number by 10, 100 or 1000, the value of each digit is multiplied.

Each digit moves the necessary number of places to the left because multiplying by 10, 100 or 1000 increases the number.

3.02 x 10 = 30.2
3.02 x 100 = 302
3.02 x 1000 = 3020

			3	.	0	2	
		3	0	.	2		← x 10
			3	.	0	2	
	3	0	2	.			← x 100
			3	.	0	2	
3	0	2	0	.			← x 1000

Remember:

1. Keep the digits together. Don't let any 0s jump in!
3.02 x 100 = 300.2 ✗ 302 ✓

2. Round to check:
3.02 x 1000 = 3020
use 3 x 1000 = 3000

By year 5, your child has been introduced to all the most efficient methods but the values become bigger and the reasoning questions involve more steps/processes. They must link their previous knowledge and skills to work out the questions.

H	T	U	.	1/10	1/100
	4	2	.	3	
	3	1	.	4	
	7	3	.	7	

H	T	U	.	1/10	1/100
	2	5	.	6	5
−	1	2	.	2	3
	1	3	.	4	2

Short division

98 ÷ 7 becomes

```
   1 4
  -----
7 | 9 8
    2
```

Answer: 14

432 ÷ 5 becomes

```
     8  6  r2
    -------
5 | 4  3  2
      3
```

Answer: 86 remainder 2

123 x 45

1st step

```
  123
x  45
 ----
  615   (123 x 5)
  11
 ----
```

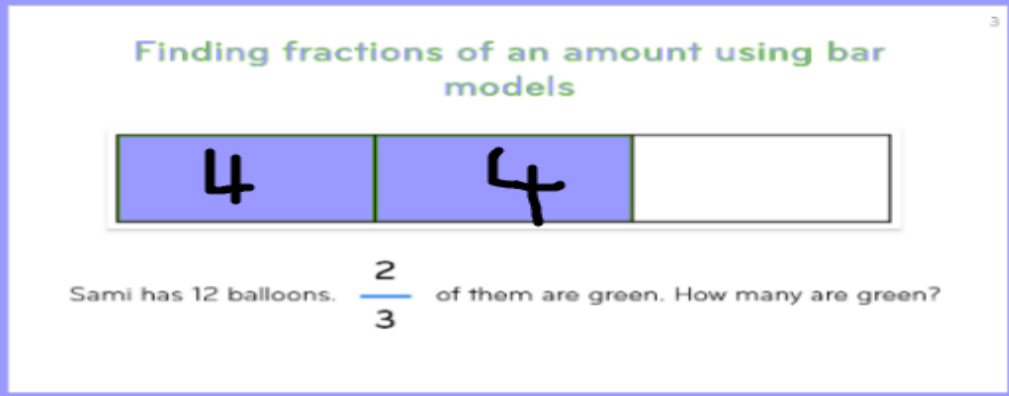
2nd step

```
  123
x  45
 ----
  615
 ----
    0   (because we are multiplying tens)
 ----
```

3rd step

```
  123
x  45
 ----
  615   (123 x 5)
 4920   (123 x 40)
  1
 5535   (615 + 4920)
 ----
```

BAR MODELS now support work with fractions as it is linked with division



The whole bar is worth 12. We have to split it in to thirds as that is the denominator. So 12 divided by 3 = 4. Each box is now worth 4. We want two of those boxes so we do 4 +4 or 4 x 2 which is 8.

Short division

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7\overline{)98} \end{array}$$

Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 86\ r2 \\ 5\overline{)432} \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 45\ r1 \\ 11\overline{)496} \end{array}$$

Answer: $45\frac{1}{11}$

The remainder becomes the numerator and the number you are dividing by becomes the denominator.

YEAR 6

Formal Long Division

$$\begin{array}{r} 11\ r\ 3 \\ 25\overline{)278} \\ -\ 25 \\ \hline 028 \\ -\ 25 \\ \hline 3 \end{array}$$

432 ÷ 15 becomes

$$\begin{array}{r} 28{\cdot}8 \\ 15\overline{)432{\cdot}0} \\ -\ 30\phantom{{\cdot}0} \\ \hline 132 \\ -\ 120 \\ \hline 120 \\ -\ 120 \\ \hline 0 \end{array}$$

Answer: 28·8

15
30
45
60
75
90

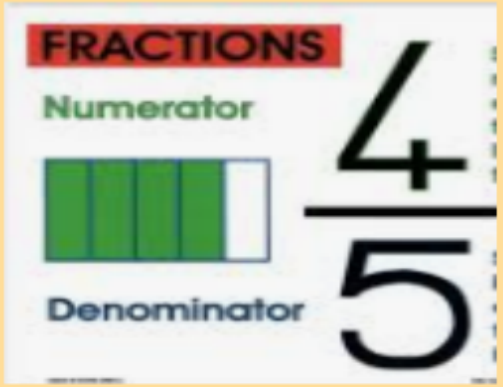
When dividing by two digit numbers, always write the times table down the side. You can work this out by using repeated addition which you learnt in previous years. This way you don't have to hold the times tables in your head.

Please see all previous year groups as year 6 is consolidating these previous skills.

Fractions

Fraction = number of parts / total parts

Every fraction has a numerator that equals the number of parts we have and a denominator equaling the total number of parts in a whole.

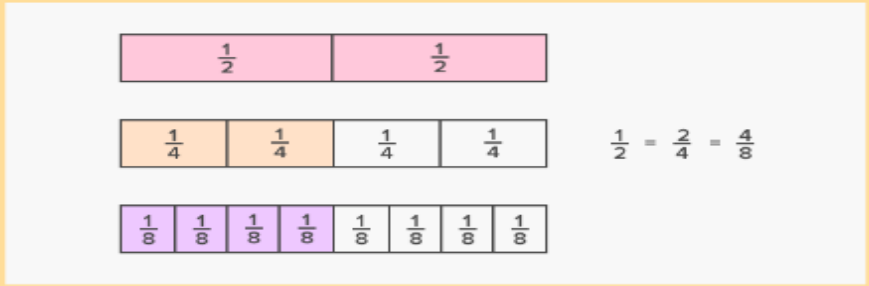


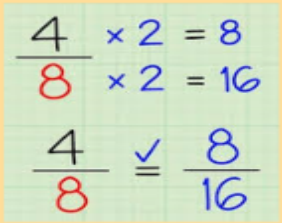
$\frac{2}{2}$ = 1 Whole

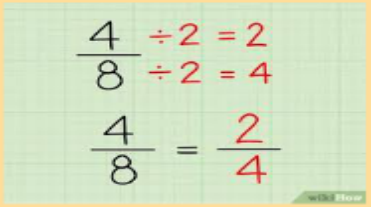
$\frac{3}{3}$ = 1 whole

EQUIVALENCES

Fraction walls are useful to see equivalence. As we move up the year groups, we will use our mutltiplication and division facts to work this out.

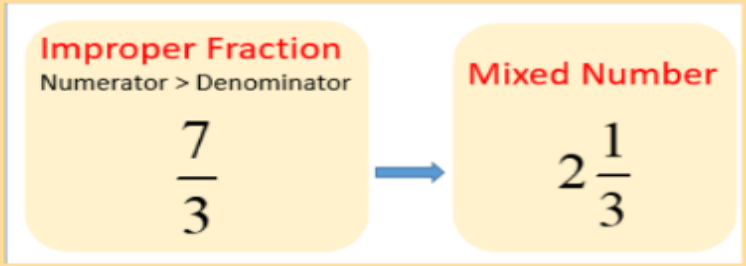


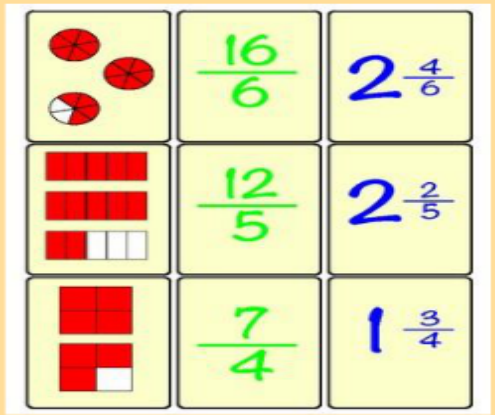




What ever you do to the top, you must do to the bottom

IMPROPER AND MIXED NUMBER FRACTIONS





Use of images helps to convert fractions from mixed number to improper fractions and vice versa. Here's how I do it mathematically.

Mixed to improper

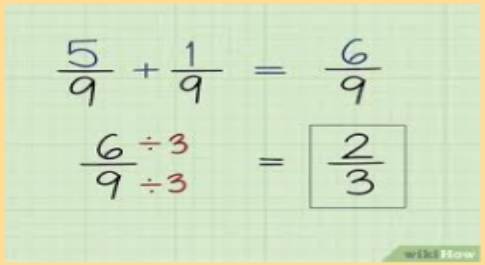
$2\frac{4}{6}$

2 x 6 = 12 (I do this because 1 whole has 6 pieces so 2 wholes will have 12) and then I add the 4 parts.

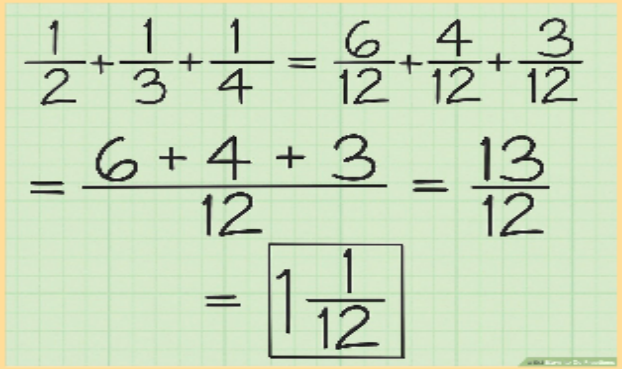
$\frac{16}{6}$

Opposite way, I say to myself 'How many times does 6 go in to 16?' The answer is '2' with a remainder of 4, which I put over the denominator.

ADDING/SUBTRACTING FRACTIONS



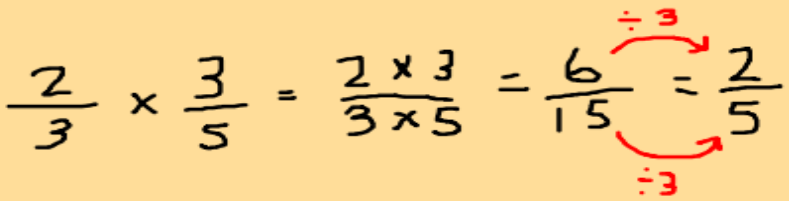
If the denominator is the same, you simply add the numerators and keep the denominator the same. This has been simplified using our knowledge of equivalences.



If the denominators are different, you need to find the lowest common multiple. The smallest number that is a multiple of the denominators. In this case 12.

2 4 6 8 10 12
3 6 9 12
4 8 12

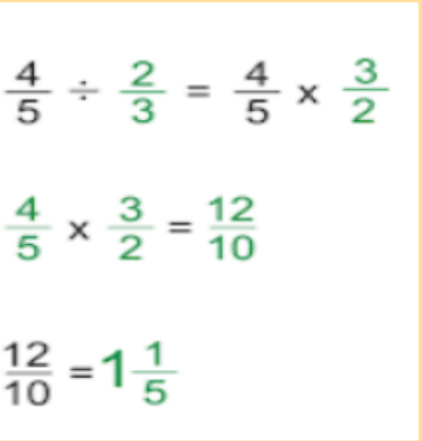
MULTIPLYING FRACTIONS



Simply multiply the numerators and the denominators.

DIVIDING FRACTIONS

'Flip, reverse it'

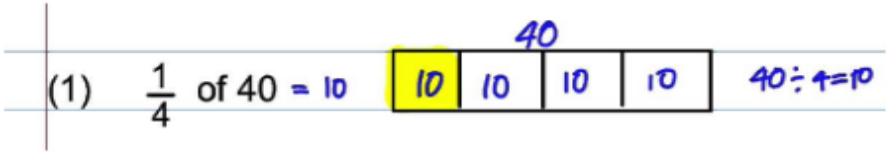


Flip the second fraction

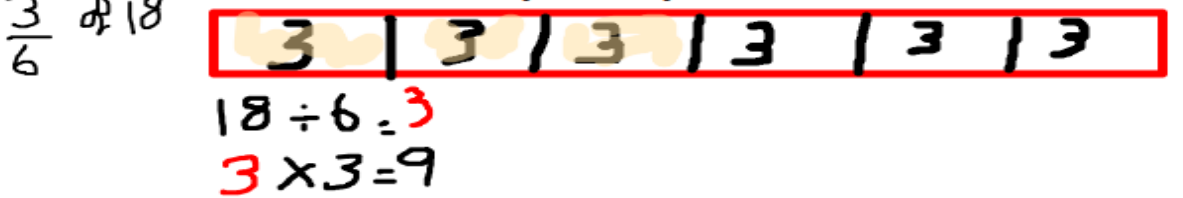
Reverse the operation: division becomes times.

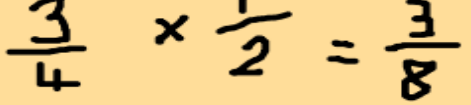
Simplify

Fractions of amounts



To find fractions of amounts you must divide by the denominator and this will tell you one part. Then take this answer and multiply it by the numerator. A bar model to show you why.





If the fraction is divided by a whole number, place a one underneath the fraction and then do the same method. The reason being is because 2 wholes is the same as 2/1