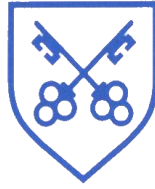


# St Peter's C E Academy

St. Peter's School



Raunds



## Our Approach to Calculations

This booklet is designed to outline the stages of written calculations throughout school for the four number operations. These written methods are based around a sound understanding of times tables along with being able to rapidly recall their associated division facts. A good understanding of number bonds to 10, 20 and 100, along with the number system and place value is also essential.

Throughout the booklet the strategies for each operation have been organised so that children can build upon these methods. It is vitally important that the children understand the associated method and are capable of explaining to others. When a new strategy is introduced previous learning may be recapped before progression can take place.

The children are expected to have, a sound method for each of the four operations that they can apply and explain this when solving problems.

# ADDITION

## Mental Skills.

- \* Count on in ones and tens.
- \* Know number bonds to 10 and 20.
- \* Recognise the size and position of numbers.
- \* Add multiples of 10 to any number.
- \* Partition and recombine numbers.

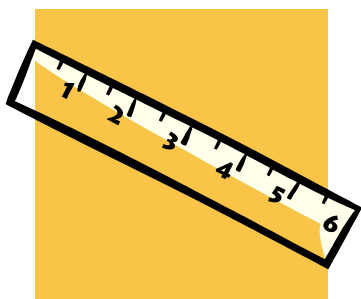
add          count on

addition      plus

more                  sum                  total

altogether      increase

## Count on using a number line or ruler.

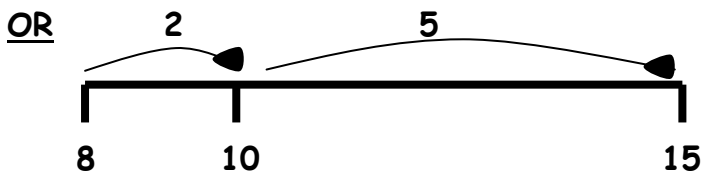
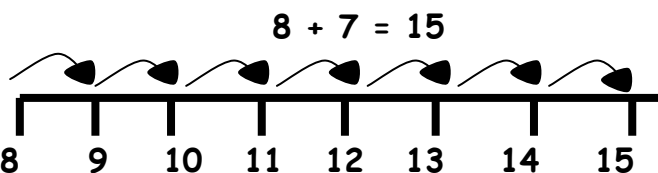


Count on from the largest number.

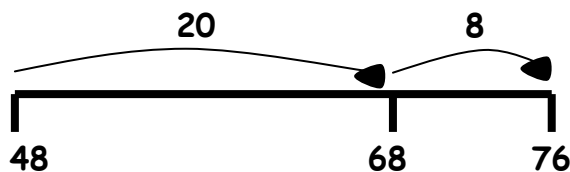
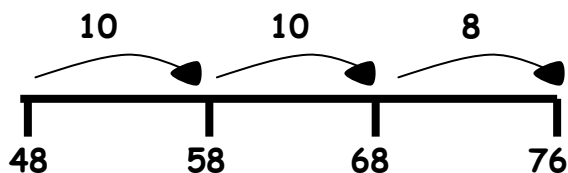
Add the tens first then the units.

Add numbers in a different order to make the calculation easier.

LOOK FOR NUMBER BONDS!



$28 + 48 = 76$



$8 + 7 + 2 + 5 + 3$

is the same as

$8 + 2 + 7 + 3 + 5$

$10 + 10 + 5 = 25$

$37 + 48 + 23$

is the same as

$37 + 23 + 48$

$= 60 + 48$

$= 108$

<p><u>Near Doubles.</u></p>	<p style="text-align: center;"><math>8 + 9 = 17</math></p> <p style="text-align: center;">is the same as 1 more than double 8 (<math>16 + 1 = 17</math>) or 1 less than double 9 (<math>18 - 1 = 17</math>)</p> <p style="text-align: center;"><math>37 + 36 = 73</math></p> <p style="text-align: center;">is the same as 1 more than double 36 (<math>72 + 1 = 73</math>) or 1 less than double 37 (<math>74 - 1 = 73</math>)</p>																		
<p><u>Near Multiple of 10 and Adjust.</u></p>	<p style="text-align: center;"><math>34 + 48 = 82</math></p> <p style="text-align: center;">is the same as 34 add 50 and subtract 2</p> <div style="text-align: center;"> </div> <p><math>64 + 71 = 135</math> is the same as 64 plus 70 plus 1 more</p>																		
<p><u>Partitioning.</u> TU + TU</p> <p>Mental strategy with jottings.</p>	<p style="text-align: center;"><math>86 + 37 = 123</math></p> <p><math>86 + 37 = 123</math></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><math>(80 + 30) + (6 + 7) = 123</math></p> <p>↓                      ↓</p> <p><math>110 + 13 = 123</math></p> </div> <div style="text-align: center;"> <p><u>OR</u></p> <table style="margin: auto;"> <tr><td style="text-align: right;">80</td><td>+</td><td>6</td></tr> <tr><td style="text-align: right;">30</td><td>+</td><td>7</td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td style="text-align: right;">110</td><td>+</td><td>13</td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td colspan="3" style="text-align: right;">123</td></tr> </table> </div> </div>	80	+	6	30	+	7	<hr/>			110	+	13	<hr/>			123		
80	+	6																	
30	+	7																	
<hr/>																			
110	+	13																	
<hr/>																			
123																			
<p><u>Expanded Column Method.</u></p> <p>Add the <u>units</u> first</p> <p>You should be able to explain clearly what you are doing with understanding of place value</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <math display="block">\begin{array}{r} 47 \\ + 76 \\ \hline 13 \\ 110 \\ \hline 123 \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 648 \\ + 286 \\ \hline 14 \\ 120 \\ \hline 800 \\ \hline 934 \end{array}</math> </div> </div>																		
<p><u>Column Method with Carrying</u></p> <p>Carry digits are recorded <u>below the line</u></p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <math display="block">\begin{array}{r} 47 \\ + 76 \\ \hline 123 \\ 1 \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 648 \\ + 286 \\ \hline 934 \\ 11 \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 268.74 \\ 86.046 \\ + 47.8 \\ \hline 402.586 \\ 221 \end{array}</math> </div> </div> <p>Extend understanding into decimals and in context of money and measures.</p>																		

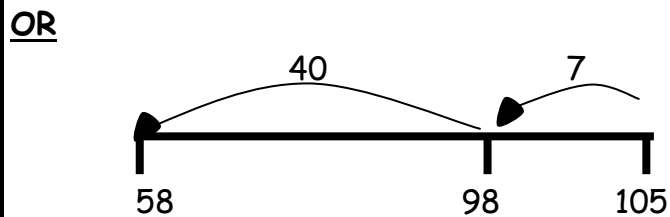
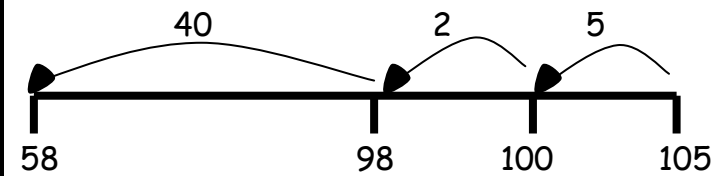
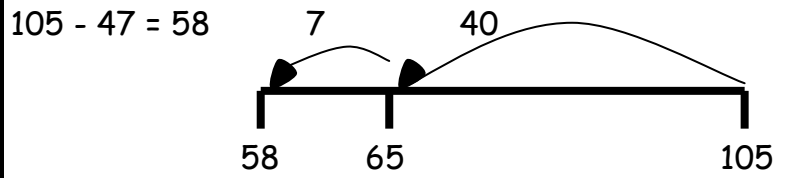
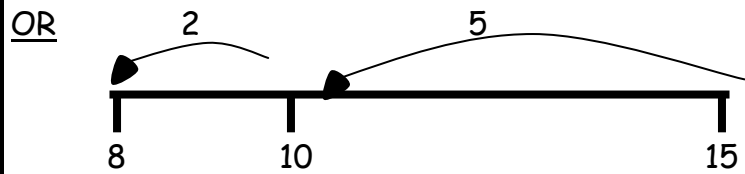
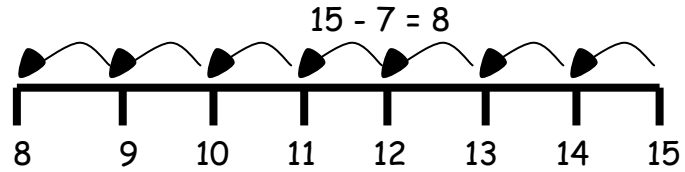
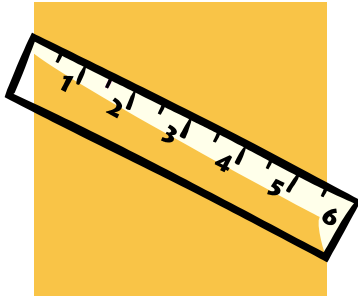
# SUBTRACTION

## Mental Skills

- \* Recognise the size and position of numbers.
- \* Count back in ones and tens.
- \* Subtract multiples of 10 from any number.

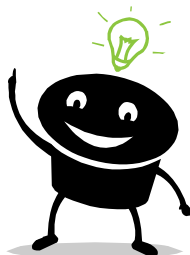
takeaway reduce count back fewer decrease	subtract less minus difference between exchanging
---	---

## Count back using a number line or ruler.



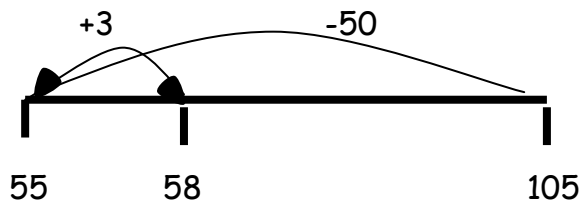
## Near Multiple of Ten and Adjust.

This is a good mental strategy.



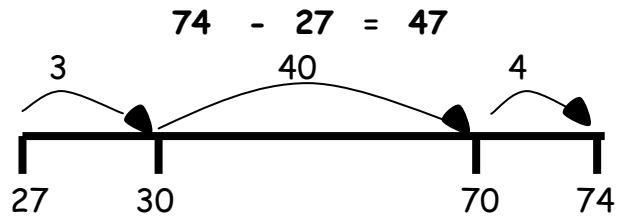
$105 - 47 = 58$

Same as subtract 50 and then add back 3



**Counting On Using a Number Line**  
**OR Set Out Vertically.**

This method can be used with decimals but it becomes less efficient with decimals and bigger numbers.



$74$	$74$
$-27$	$-27$
<hr style="width: 50px; margin: 0;"/>	<hr style="width: 50px; margin: 0;"/>
3 30	3 30
40 70	44 74
$4$ 74	$47$
<hr style="width: 50px; margin: 0;"/>	<hr style="width: 50px; margin: 0;"/>
47	

**Column method without exchanging.** ( Also known as **the Vertical method.**)

$$\begin{array}{r} 96 \\ - 43 \\ \hline 53 \end{array}$$



$$\begin{array}{r} 376 \\ -134 \\ \hline 242 \end{array}$$

**Expanded Method Leading to Column Method.**

TU - TU

The expanded method leads to the more compact method. Only move onto this method once you have secure mental skills and you have a clear understanding of when partitioning numbers is required.

$\boxed{60}$		$\boxed{14}$
<del>70</del>	+	<del>4</del>
- 20	+	7
<hr style="width: 50px; margin: 0;"/>		<hr style="width: 50px; margin: 0;"/>
40	+	7
<hr style="width: 50px; margin: 0;"/>		<hr style="width: 50px; margin: 0;"/>

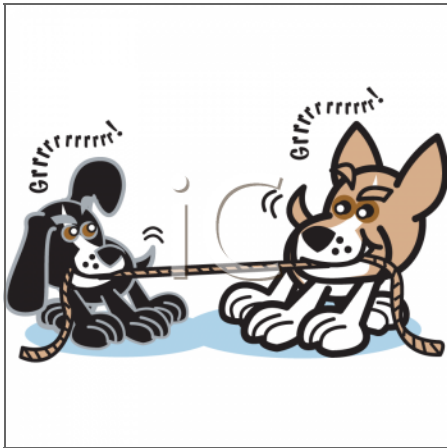
Leading to



$\boxed{60}$	$\boxed{14}$
<del>7</del>	<del>4</del>
- 2	7
<hr style="width: 50px; margin: 0;"/>	<hr style="width: 50px; margin: 0;"/>
4	7

Expanded Method Leading to Column Method.

HTU - HTU



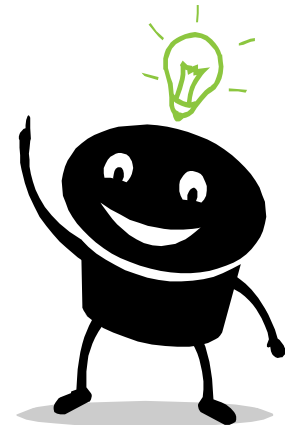
Exchanging

Exchange from the next column along if you can't take away.

$$741 - 367 = 374$$

$$\begin{array}{r}
 \boxed{130} \\
 \boxed{600} \quad \boxed{30} \quad \boxed{11} \\
 \cancel{700} + \cancel{40} + \cancel{1} \\
 - 300 + 60 + 7 \\
 \hline
 300 + 70 + 4
 \end{array}$$

$$\begin{array}{r}
 \boxed{13} \\
 \boxed{6} \quad \boxed{3} \quad \boxed{11} \\
 \cancel{7} \quad \cancel{4} \quad \cancel{1} \\
 - 3 \quad 6 \quad 7 \\
 \hline
 3 \quad 7 \quad 4
 \end{array}$$



Are you choosing the best strategy for yourself?

Extend Column Method to Include Zero Values.

$$604 - 248 = 356$$

$$\begin{array}{r}
 \boxed{90} \\
 \boxed{500} \quad \boxed{100} \quad \boxed{14} \\
 \cancel{600} + \cancel{0} + \cancel{4} \\
 - 200 + 40 + 8 \\
 \hline
 300 + 50 + 6
 \end{array}$$

Leading to

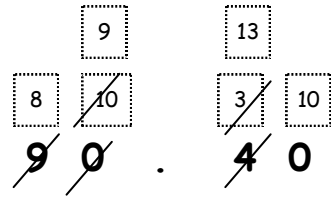
$$\begin{array}{r}
 \boxed{9} \\
 \boxed{5} \quad \boxed{10} \quad \boxed{14} \\
 \cancel{6} \quad \cancel{0} \quad \cancel{4} \\
 - 2 \quad 4 \quad 8 \\
 \hline
 3 \quad 5 \quad 6
 \end{array}$$

**Extended Column Method to Include Decimals and Zero Values.**

Line up the decimal points and place an extra zero if necessary.



$$90.4 - 58.75 = 31.65$$



$$\begin{array}{r} \phantom{0} \\ - 58.75 \\ \hline 31.65 \end{array}$$

**Are you using the best strategy for yourself?**

**Choose the best strategy for yourself.**

A column method may not always be the most efficient strategy!

**What about  $90.4 - 58.75$ ?**

Near multiple and adjust


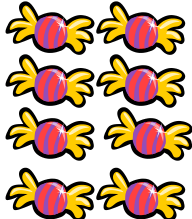

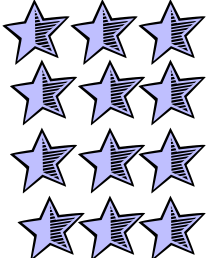
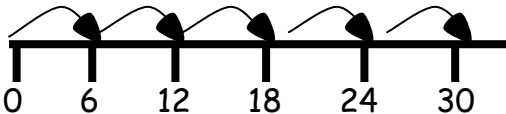
$$\begin{array}{l} \text{Subtract } 60 = 30.4 \\ \text{Add back } 1.25 = 31.65 \end{array}$$

Count on?

Set out vertically

$$\begin{array}{r} 90.4 \\ - 58.75 \\ \hline 1.25 \\ \hline 30.4 \\ \hline 31.65 \end{array} \quad \left. \vphantom{\begin{array}{r} 90.4 \\ - 58.75 \\ \hline 1.25 \\ \hline 30.4 \\ \hline 31.65 \end{array}} \right\} +$$

# MULTIPLICATION

<p><b><u>Mental Skills</u></b></p> <ul style="list-style-type: none"> <li>* Count on in different steps.</li> <li>* Double and halve numbers.</li> <li>* Recognise multiplication as repeated addition.</li> <li>* Use known facts to derive associated numbers.</li> <li>* Multiply by 10, 100 and 1000.</li> <li>* Quick recall of multiplication facts.</li> <li>* Multiplying by multiples of 10.</li> <li>* Estimation.</li> </ul>	<p>             multiplication      times      column              product      double      lots of      row              groups of      lots of      multiply              once      twice      three times              multiple      repeated addition      array         </p>
<p><b><u>Count on in groups and record as arrays.</u></b></p>	<p>             2 groups of 4 = 8      4 groups of 2 = 8  <math>2 \times 4 = 8</math>      <math>4 \times 2 = 8</math>    </p>
<p><b><u>Count on in groups along a number line or ruler.</u></b></p>	<p>             How many groups of 3 can be made from 12?              How many groups of 4 can be made from 12?    </p> <p style="text-align: center;">Apply times tables and associated facts to groupings</p> <p style="text-align: center;"> <math>3 \times 4 = 12</math>      <math>12 \div 4 = 3</math>  <math>4 \times 3 = 12</math>      <math>12 \div 3 = 4</math> </p>
<p><b><u>Count on in groups along a number line or ruler.</u></b></p>	<p><math>5 \times 6 = 30</math></p> 



Doubling and Halving.

By doubling one number and halving the other you will create a question with the same answer.

$5 \times 16 = 80$

$14 \times 3 = 42$

$15 \times 8 = 120$

$10 \times 8 = 80$

$7 \times 6 = 42$

$30 \times 4 = 120$

Useful for finding factors of a number

$1 \times 40 = 40$

$2 \times 20 = 40$

$4 \times 10 = 40$

$5 \times 8 = 40$

Multiplying by 10 and 100.

Multiplying	Digits Move
X 10	1 place LEFT
X 100	2 places LEFT

$25 \times 10 = 250$

$25 \times 100 = 2500$

Hundred 100	Ten 10	Unit 1
	2	5
2	5	0

Thousand 1000	Hundred 100	Ten 10	Unit 1
		2	5
2	5	0	0

$9.52 \times 10 = 95.2$

Ten 10	Unit 1		Tenth 0.1	Hundredth 0.01
	9	.	5	2
9	5	.	2	

$9.52 \times 100 = 952$

Thousand 1000	Hundred 100	Ten 10	Unit 1		Tenth 0.1	Hundredth 0.01
			9	.	5	2
	9	5	2	.		

Partition Numbers.

$$\begin{aligned}
 &34 \times 6 = 204 \\
 &(30 \times 6) + (4 \times 6) \\
 &180 + 24 = 204
 \end{aligned}$$

Grid Multiplication.

TU x U

$34 \times 6 = 204$

You can use the same strategy for

HTU x U

X	30	4	
6	180	24	$180 + 24 = 204$

**Grid Multiplication.**

TU x TU



$76 \times 49 = 3724$

X	70	6
40	2800	240
9	630	54

Choose the easiest way to add them up?

$$\begin{array}{r} 3040 \\ + 684 \\ \hline 3724 \end{array}$$

1

OR

$$\begin{array}{r} 3430 \\ + 294 \\ \hline 3724 \end{array}$$

1

**Expanded Vertical Multiplication.**

TU x U

TU x TU

You can choose the same strategy for HTU x U

$34 \times 6 = 204$

$$\begin{array}{r} 34 \\ \times 6 \\ \hline 24 \\ \hline 180 \\ \hline 204 \end{array}$$

1

$76 \times 49 = 3724$

$$\begin{array}{r} 76 \\ \times 49 \\ \hline 54 \\ 630 \\ 240 \\ 2800 \\ \hline 3724 \end{array}$$

1 1 1

With or without carrying.

**Compact Vertical Multiplication**

TU x U & TU x TU  
HTU x U & HTU x TU

Partial carrying of digits can be wrote but mental recording is preferred.

$$\begin{array}{r} 34 \\ \times 6 \\ \hline 204 \end{array}$$

2

$$\begin{array}{r} 76 \\ \times 49 \\ \hline 684 \\ 3040 \\ \hline 3724 \end{array}$$

Most able pupils extend to

HTU x TU

Estimation is a key process with all calculations but especially important when working with bigger numbers and decimals.

Gelosia Method

Set up the grid by marking its rows and columns with the numbers to be multiplied. Next, fill in the boxes with tens digits in the top triangles and units digits on the bottom.

Read LEFT to RIGHT

(down the stairs, across the landing)

$274 \times 32 = 8768$

Estimate

$300 \times 30 = 9000$

$$\begin{array}{r} 274 \\ \times 32 \\ \hline 548 \\ 8220 \\ \hline 8768 \end{array}$$

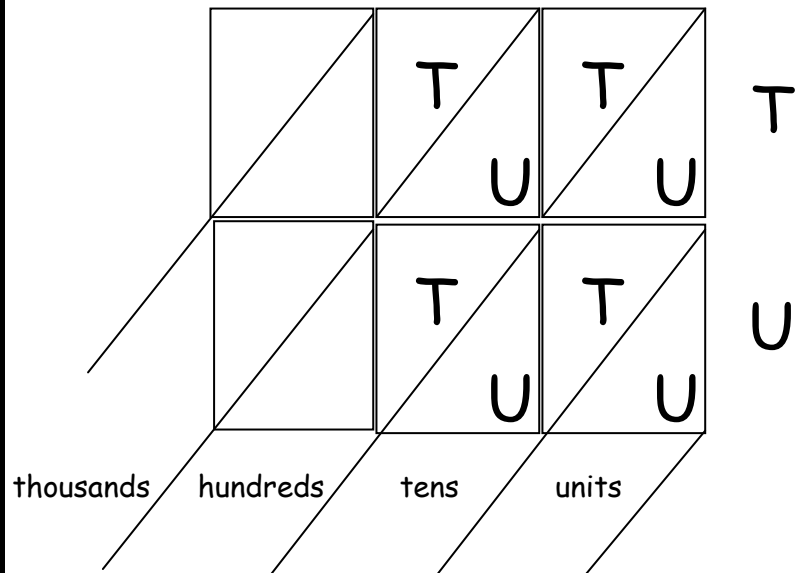
$659 \times 78 = 51402$

Estimate

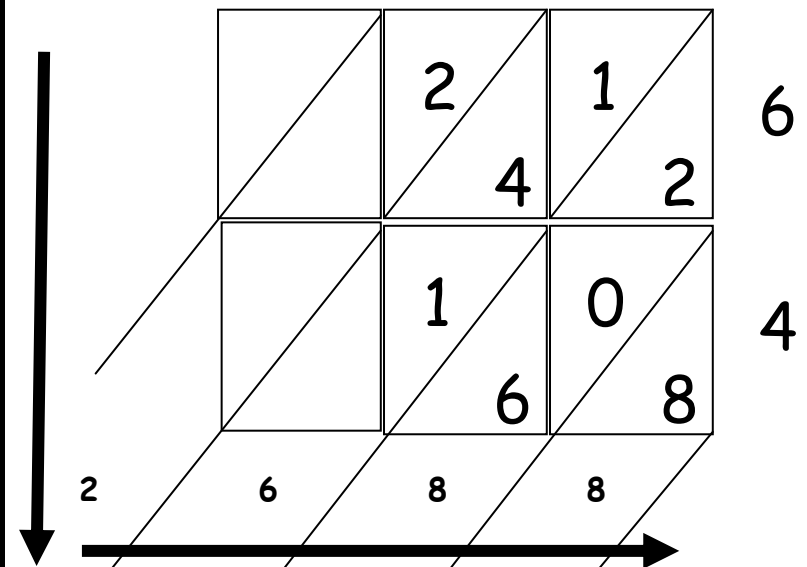
$700 \times 80 = 56000$

$$\begin{array}{r} 659 \\ \times 78 \\ \hline 5272 \\ 46130 \\ \hline 51402 \end{array}$$

TU x TU                      T      U      X

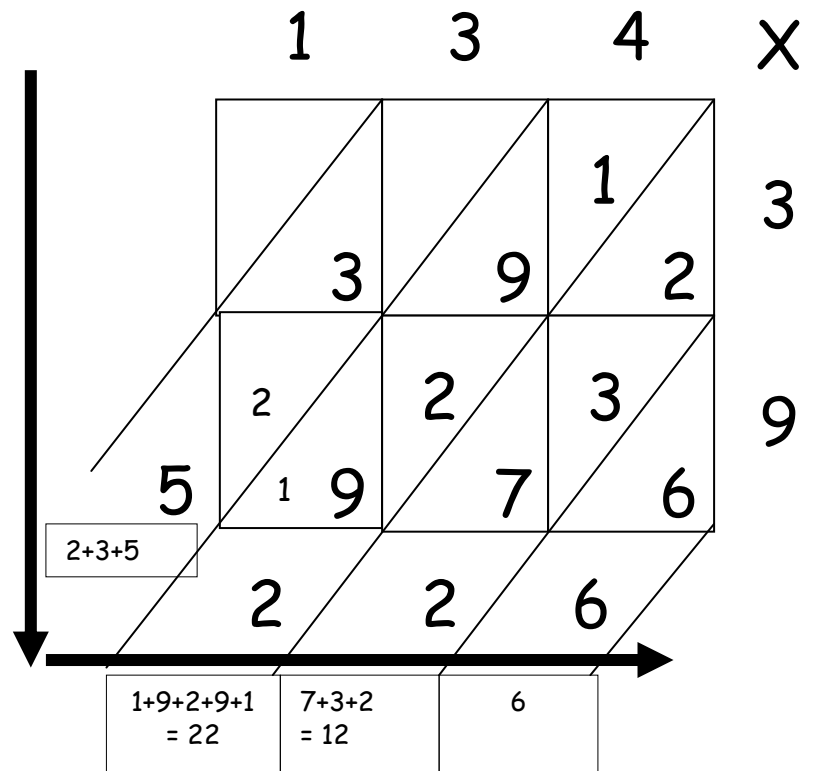


$42 \times 64 = 2688$                       4      2      X



Multiply HTU x TU with carrying.

$$134 \times 39 = 5226$$



Working with decimals.

Decimals

$$3.4 \times 7.5 = 25.5$$

Estimate

$$3 \times 8 = 24$$

Think of equivalent calculation

$$34 \times 75 \div 100$$

Multiply digits together (ignore decimals)

$$\begin{array}{r} 34 \\ \times 75 \\ \hline 170 \\ 2380 \\ \hline 2550 \end{array}$$

The number of numbers after the decimal place tells you how many places to move the decimal point from the right.

e.g.  $3.\boxed{4} \times 7.\boxed{5}$

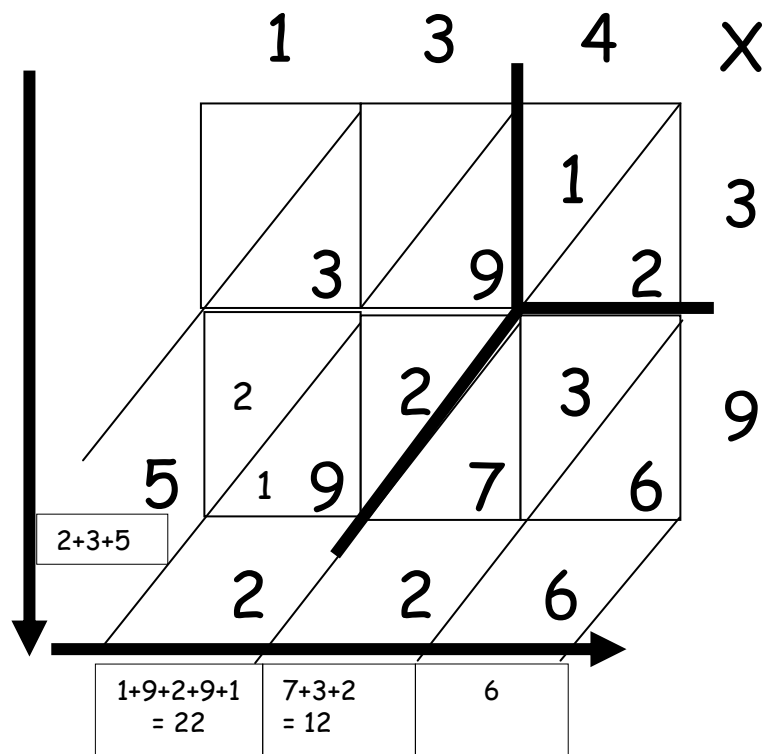


25 . 80 start here

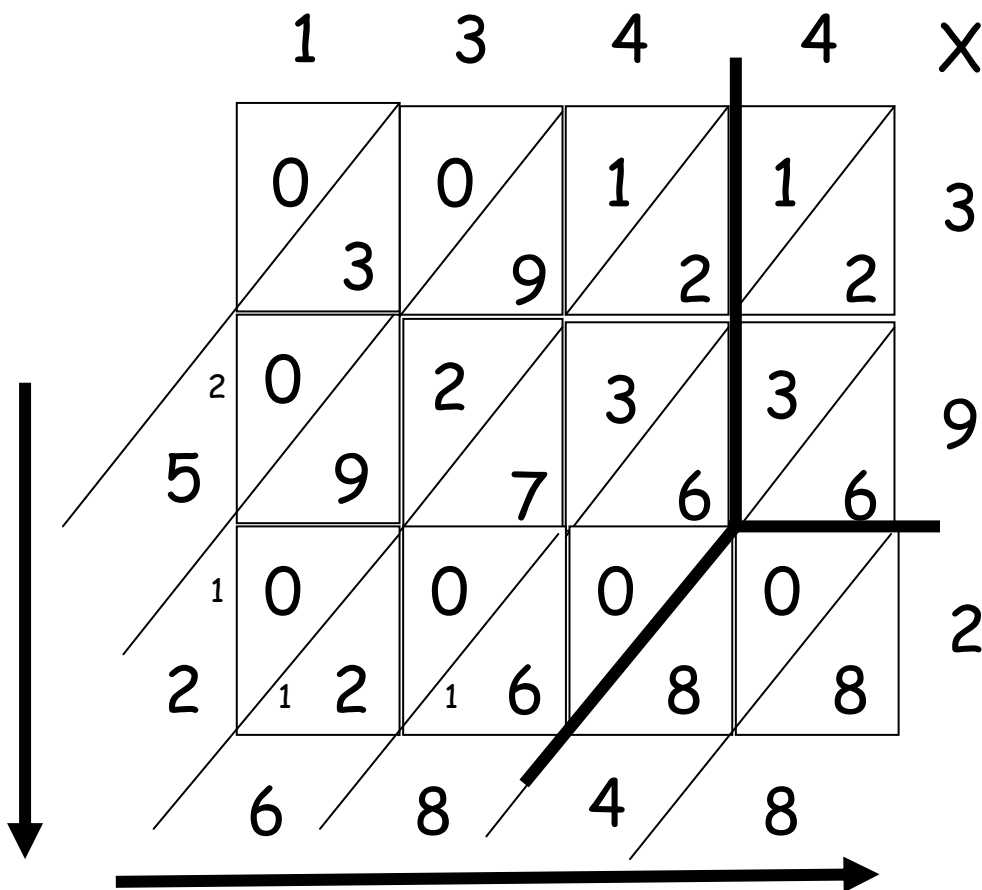
**Gelosia Method to Multiply Decimals.**

Draw a line from each decimal point until it meets then extend diagonally left through the grid

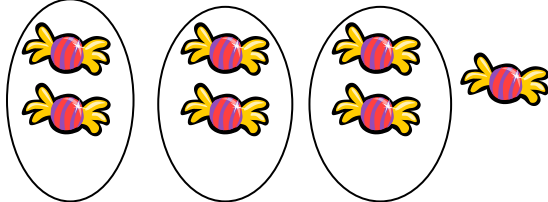

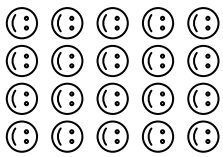
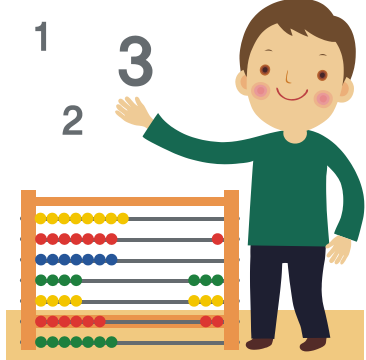
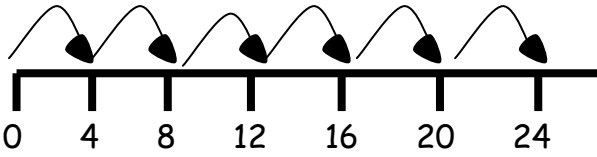
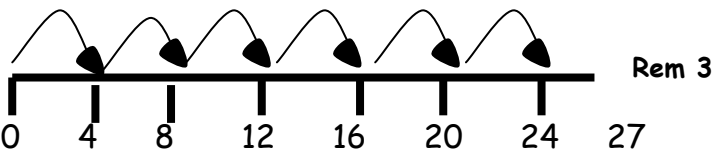
$$13.4 \times 3.9 = 52.26$$



$$134.4 \times 39.2 = 5268.48$$



# DIVISION

<p><b><u>Mental Skills</u></b></p> <ul style="list-style-type: none"> <li>* Count back in different steps.</li> <li>* Double and half numbers.</li> <li>* Recognise division as repeated subtraction.</li> <li>* Quick recall of division facts.</li> <li>* Use known facts to derive associated divisions.</li> <li>* Divide by 10, 100 and 1000.</li> <li>* Divide by multiples of 10.</li> </ul>	<p style="text-align: center;">             divide    lots of    half    halve              divisible    group    groups of              divide by    dividend              quotient    remainder              divisor    factor    share    halve         </p> <p><b>Key Language</b> <math>18 \div 3 = 6</math>              18 is the dividend, 3 is the divisor, 6 is the quotient</p>
<p><b><u>Practical examples of sharing including remainders.</u></b></p>	<p style="text-align: center;">I have 7 sweets to share between 3 of us, what shall I do?</p> <div style="text-align: center;">  </div>
<p><b><u>Understand grouping and be able to explain arrays.</u></b></p> <p style="text-align: center;">(grouping)</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>20 divided into groups of 4 Gives 5 groups (<math>20 \div 4 = 5</math>)</p> </div> <div style="text-align: center;">  <p>20 divided into groups of 5 Gives 4 groups (<math>20 \div 5 = 4</math>)</p> </div> </div>
<p><b><u>Use a number line to count on in groups.</u></b></p> <div style="text-align: center;">  </div>	<div style="text-align: center;"> <p><math>24 \div 4 = 6</math></p>  </div> <div style="text-align: center; margin-top: 20px;"> <p><math>27 \div 4 = 6 \text{ remainder } 3</math></p>  </div>

Dividing by 10 and 100.

Dividing	Digits Move
$\div 10$	1 place RIGHT
$\div 100$	2 places RIGHT

$250 \div 10 = 25$

Hundred 100	Ten 10	Unit 1
2	5	0
	2	5

$2500 \div 100 = 25$

Thousand 1000	Hundred 100	Ten 10	Unit 1
2	5	0	0
		2	5

$95.2 \div 10 = 9.52$

Ten 10	Unit 1		Tenth 0.1	Hundredth 0.01
9	5	.	2	
	9	.	5	2

$360 \div 100 = 3.6$

Hundred 100	Ten 10	Unit 1		Tenth 0.1	Hundredth 0.01
3	6	0	.		
		3	.	6	

Use known multiplication facts to work out associated divisions.

$24 \div 4 = 6$

use  $4 \times ? = 24$

$35 \div 7 = 5$

use  $7 \times ? = 35$

Mental division using Partitioning.

Multiples of 10

$64 \div 4 = 16$

$(40 \div 4) + (24 \div 4)$

$10 + 6 = 16$

$102 \div 3 = 34$

$(90 \div 3) + (12 \div 3)$

$30 + 4 = 34$

$91 \div 7 = 13$

$(70 \div 7) + (21 \div 7)$

$10 + 3 = 13$

$196 \div 6 = 32 \text{ rem } 4$

$(180 \div 6) + (12 \div 6)$

$30 + 2 = 32 \text{ rem } 4$

$= 32 \frac{4}{6} = 32 \frac{2}{3}$

Chunking Up.

This method is based on separating the dividend into multiples of the divisor. Initially children can split up into several chunks but with practice they **should look for bigger chunks** of the divisor.

$$64 \div 4 = 16 \qquad \begin{array}{r} 10 + 6 = 16 \\ 4 \overline{) 40 + 24} \end{array}$$

$$91 \div 7 = 13 \qquad \begin{array}{r} 10 + 3 = 13 \\ 7 \overline{) 70 + 21} \end{array}$$

$$102 \div 3 = 34 \qquad \begin{array}{r} 30 + 4 = 34 \\ 3 \overline{) 90 + 12} \end{array}$$

$$3 \overline{) 30 + 30 + 30 + 12} = 34$$

$$196 \div 6 = 32 \text{ rem } 4 = 32 \frac{4}{6} = 32 \frac{2}{3}$$

$$\begin{array}{r} 30 + 2 \text{ rem } 4 \\ 6 \overline{) 180 + 12} \end{array} = 32 \text{ rem } 4$$

Short Division.

$$64 \div 4 = 16 \qquad \begin{array}{r} 1 \ 6 \\ 4 \overline{) 6 \ 24} \end{array} \qquad \begin{array}{r} 1 \ 3 \\ 7 \overline{) 9 \ 21} \end{array}$$

$$91 \div 7 = 13 \qquad \begin{array}{r} 0 \ 3 \ 4 \\ 3 \overline{) 1 \ 10 \ 12} \end{array}$$

$$102 \div 3 = 34$$

What to do with remainders - decimals or fraction?

$$196 \div 6 = 32 \text{ rem } 4$$

$$\begin{array}{r} 0 \ 3 \ 2 \text{ rem } 4 \\ 6 \overline{) 1 \ 19 \ 16} \end{array} = 32 \frac{4}{6} = 32 \frac{2}{3} \text{ simplified}$$

$$350 \div 8 = 43 \text{ rem } 6 \qquad \begin{array}{r} 0 \ 4 \ 3 \text{ rem } 6 \\ 8 \overline{) 3 \ 35 \ 30} \end{array}$$

$$\begin{array}{r} 0 \ 4 \ 3 \ . \ 7 \ 5 \\ 8 \overline{) 3 \ 35 \ 30 \ . \ 60 \ 40} \end{array} = 43 \frac{6}{8} = 43 \frac{3}{4}$$



### Chunking Down.

The key to efficiency with this strategy lies in the estimate that is made before the chunking starts.

e.g. for  $196 \div 6$

$$6 \times 10 = 60$$

$$6 \times 20 = 120$$

$$6 \times 30 = 180$$

$$6 \times 40 = 240$$

Therefore the answer lies between 30 and 40.

This method is based on subtracting multiples of the divisor. Initially children subtract several chunks but with practice they should look for the biggest multiples of the divisor to subtract.

$$102 \div 3 = 34$$

$$\begin{array}{r} 34 \\ 3 \overline{) 102} \\ \underline{90} \quad (\times 30) \\ 12 \\ \underline{12} \quad (\times 4) \\ 0 \quad 34 \end{array}$$

$$196 \div 6 = 32 \text{ rem } 4 = 32 \frac{4}{6} = 32 \frac{2}{3}$$

$$\begin{array}{r} 32 \text{ r } 4 \\ 6 \overline{) 196} \\ \underline{60} \quad (\times 10) \\ 136 \\ \underline{60} \quad (\times 10) \\ 76 \\ \underline{60} \quad (\times 10) \\ 16 \\ \underline{12} \quad (\times 2) \\ 4 \end{array}$$

$$\begin{array}{r} 32 \text{ r } 4 \\ 6 \overline{) 196} \\ \underline{180} \quad (\times 30) \\ 16 \\ \underline{12} \quad (\times 2) \\ 4 \end{array}$$

### Long Division.

HTU  $\div$  TU

List the times tables you're working with to help you get started.

$$560 \div 24 = 23 \text{ rem } 8 = 23 \frac{8}{24} = 23 \frac{1}{3} \text{ simplified}$$

How many lots of 24 can we make from 560?

Estimate first.

$$24 \times 10 = 240 \quad 24 \times 20 = 480 \quad 24 \times 30 = 720$$

So the answer will be between 20 and 30.

$$\begin{array}{r} 23 \text{ r } 8 \\ 24 \overline{) 560} \\ \underline{480} \quad (\times 20) \\ 80 \\ \underline{72} \quad (\times 3) \\ 8 \end{array}$$

24 Times Table

1	24
2	48
3	72
4	96
5	120
6	144
7	168
8	192
9	216
10	240

# BODMAS

It is common, when approaching a calculation in mathematics to ask yourself 'where do I start?' or 'what do I do first?'. There is a set order in which you should undertake the basic operations of arithmetic (adding, subtracting, multiplying and dividing). The acronym BODMAS helps you remember this order

## What is BODMAS?

BODMAS stands for Brackets, Order, Divide, Multiply, Add, Subtract and reminds you in what sequence to carry out the operations for arithmetic.

(B)rackets ( )	FIRST
(O)rder $^2\sqrt{\quad}$	(SQUARED OR SQUARE ROOTS ETC)
(D)ivision $\div$	} LEFT TO RIGHT
(M)ultiplication $\times$	
(A)ddition $+$	} LEFT TO RIGHT
(S)ubtraction $-$	

When you see something like...

$$7 + (6 \times 5^2 + 3)$$

... what part should you calculate first?

Start at the left and go to the right?  
Or go from right to left?

Calculate them in the wrong order, and you will get a wrong answer !

Do things in Brackets First. Example

✓  $6 \times (5 + 3) = 6 \times 8 = 48$

✗  $6 \times (5 + 3) = 30 + 3 = 33$  (wrong)

Then "Orders" (Powers, Roots) before Multiply, Divide, Add or Subtract. Example:

✓  $5 \times 2^2 = 5 \times 4 = 20$

✗  $5 \times 2^2 = 10^2 = 100$  (wrong)

Then Multiply or Divide before you Add or Subtract. Example:

✓  $2 + 5 \times 3 = 2 + 15 = 17$

✗  $2 + 5 \times 3 = 7 \times 3 = 21$  (wrong)

Otherwise just go left to right. Example:

✓  $30 \div 5 \times 3 = 6 \times 3 = 18$

✗  $30 \div 5 \times 3 = 30 \div 15 = 2$  (wrong)

So ..... How Do I Remember It All Again... ? **BODMAS !**

**B** Brackets first

**O** Orders (ie Powers and Square Roots, etc.)

**DM** Division and Multiplication (left-to-right)

**AS** Addition and Subtraction (left-to-right)

Divide and Multiply rank equally (and go left to right).

Add and Subtract rank equally (and go left to right)



After you have done "B" and "O", just go from left to right doing any "D" *or* "M" as you find them.

Then go from left to right doing any "A" *or* "S" as you find them.