

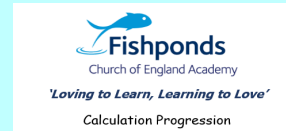
Welcome!



'Loving to Learn, Learning to Love'

Calculation Progression

Upper Key Stage 2



Aims for the workshop:

- You become aware of what Year 5/ 6 children are exposed to*
- Inform you of the methods used to calculate*
- Build your confidence in supporting your child/ren*
- Share resources to support your child*



Why is progression in mathematics important?

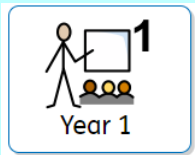
It gives the children the building blocks that they need to be successful in Mathematics and supports them to develop their calculation methods from EYFS to Year 6... and beyond!



In school we have developed a policy which builds on the previous year groups knowledge so that their understanding is fluid.



Why is progression in calculation important?

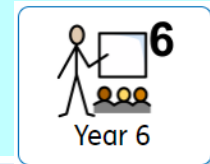


12 + 5



134 + 23 =

100s	10s	1s
100	10 10	1 1
	10	1 1
	10 10	1 1
		1



		2	6	4	5	9		
		3	5	5	4	7		
		+	6	3	4	3	2	
			1	2	5	4	3	8

Our calculation policy:



Place Value

Tm Ten Millions 10 000 000	M Millions 1 000 000	Hth Hundred Thousands 100 000	Tth Ten Thousands 10 000	Th Thousands 1000	H Hundreds 100	T Tens 10	O Ones 1	t Tenths 0.1 $\frac{1}{10}$	h Hundredths 0.01 $\frac{1}{100}$	th Thousandths 0.001 $\frac{1}{1000}$
					5	3	2	.	4	7
					↓	↓	↓	↓	↓	↓
					500	30	2	0.4	0.07	

Securing place value is the first step to successful calculation. It ensures the children know what each digit represents.



Year 5

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)

Add and subtract numbers mentally with increasingly large numbers

Year 6

Continue to embed year 5 addition and subtraction

Once embedded, Year 6 are able to focus on application to problem solving.

A lot of the foundations have been laid from in the previous year groups - this is about securing knowledge.

Add whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction):

	TTh	Th	H	T	O
	3	5,	7	8	2
+	5	3,	1	5	5
<hr/>					
	8	8,	9	3	7

Always starting with the ones

Carried over from the Tens column

This will be familiar to all as children would have learnt this method in Year 4 - with smaller digits.

Add whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction):

	TTh	Th	H	T	O
	2	6,	4	5	9
		3	5,	5	4
+	6	3,	4	3	2
	1	2	5,	4	3
			4	3	8

Always starting with the ones

Carried over from the previous columns

Progression: Adding more than 2 numbers together.

Add whole numbers and decimals, including using formal written methods (columnar addition and subtraction):

		T	O	.	ths	hths
	£	5	6	.	2	5
+	£	2	5	.	1	7
	£	8	1	.	4	2

← Always starting with the hths

Carried over from the previous columns

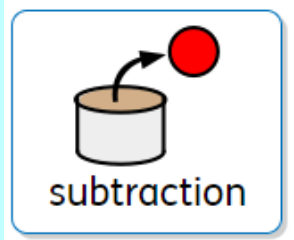
Progression: Adding decimal numbers in the context of money

Add numbers with different place values, including using formal written methods (columnar addition and subtraction):

	H	T	O	.	ths	hths
	2	3	7	.	4	
+			6	.	3	5
	2	4	3	.	7	5

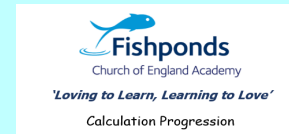
← Use a place holder to balance the equation.

Year 6 Progression: Adding decimal numbers with differing place values.



Year 5

Year 6



<p>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p> <p>Add and subtract numbers mentally with increasingly large numbers</p>	<p>Continue to embed year 5 addition and subtraction</p>
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Once embedded, Year 6 are able to focus on application to problem solving.

Once again, a lot of the foundations have been laid from in the previous year groups.

Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction):

	TTh	Th	H	T	O
			1		
Biggest number on top	5	6,	2	3	8
-	2	5,	1	5	2
	3	1,	0	8	6

Always starting with the ones

Exchange where we cannot subtract

This will be familiar to all as children would have learnt this method in Year 4 - with smaller digits.

Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction):

	TTh	Th	H	T	O
	8	9	9		
	9	0	0	5	6
-	8	4	5	7	4
	0	5	4	8	2

Year 6 Progression: Subtracting where there is no value

Subtract whole numbers and decimals, including using formal written methods (columnar addition and subtraction):

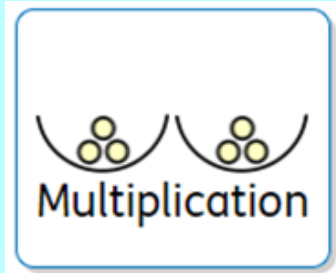
		T	O	.	ths	hths
		4				
	£	5	6	.	8	9
-	£	2	7	.	3	2
	£	2	9	.	5	7

The same rules still apply: biggest number on top; subtract from the smallest place value (hths) and exchange where needed.

Subtract numbers with different place values, including using formal written methods (columnar subtraction):

T	O	.	ths	hths
	8		1	
1	9	.	2	0
-	3	.	3	7
1	5	.	8	3

Year 6 Progression: Subtracting decimal numbers with differing place values.



Year 5

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

Multiply and divide numbers mentally drawing upon known facts

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Year 6

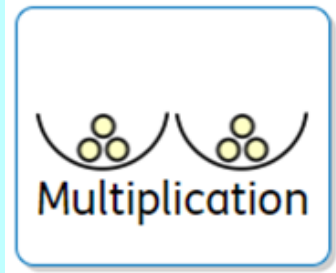
Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

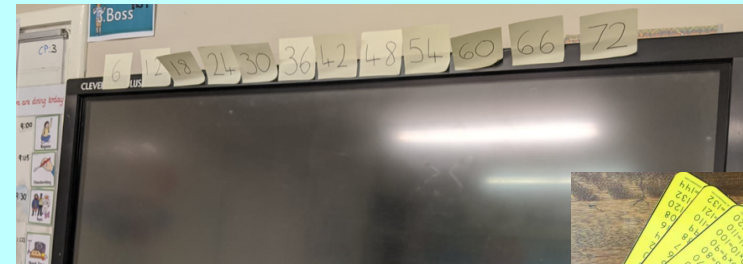
Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context



There is a lot more new learning in Year 5 & 6 - focuses on formal methods



Times tables (Y1-4)



Multiplication Table

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Multiplication Mash Up - A Fun Way to Learn Your Multiplication Facts!
 6.8M views · 4 years ago
 McCarthy Math Academy
 Tons of MATH VIDEOS here: <https://www.mccarthymathacademy.com/> My mission is to math FUN, make it CLICK, and make it ...



New vocabulary in UKS2:

2^2
 $2 \times 2 = 4$

3^2
 $3 \times 3 = 9$

Squared

$2 \times 2 \times 2 = 2^3$

Cubed

Find the factors of 18

The factors of 18 are 1, 2, 3, 6, 9 and 18

Factors

1 11

Prime numbers

BODMAS

Brackets

Orders

Division or Multiplication

Addition or Subtraction

Y6 - BODMAS

Multiply whole numbers and those involving decimals by 10, 100 and 1000

Multiplying and Dividing by 10, 100 and 1000

10 000	1000	100	10	1	●	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
			2	6	●			

Multiplying

X 10 digits move LEFT 1 space
 X 100 digits move LEFT 2 spaces
 X 1000 digits move LEFT 3 spaces

←

Not just a case of "adding 0s"

Multiply decimal numbers and those involving decimals by 10, 100 and 1000

Multiplying and Dividing by 10, 100 and 1000

10 000	1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
				3	•	2	6

Multiplying

X 10 digits move LEFT 1 space
 X 100 digits move LEFT 2 spaces
 X 1000 digits move LEFT 3 spaces

←

Not just a case of "adding 0s"

Multiply numbers up to 4 digits by a *one* - or *two*- digit number using a formal written method:

	TTh	Th	H	T	O
		7	5	2	3
X					5

← Always starting with the ones

Multiply numbers up to 4 digits by a one - or two - digit number using a formal written method:

	H	T	O	
		2	3	
X		1	6	
+				

← Always starting with the ones

← Multiply the 23 by the 6

← Multiply the 23 by the 10

Progression: Multiplying 2 digits by 2 digits

Multiply numbers up to 4 digits by a one - or two - digit number using a formal written method:

	TTh	Th	H	T	O
		1	3	2	3
X				1	6
+					

← Always starting with the ones

← Multiply the 1323 by the 6

← Multiply the 1323 by the 10

Y6 Progression: Multiplying 4 digits by 2 digits

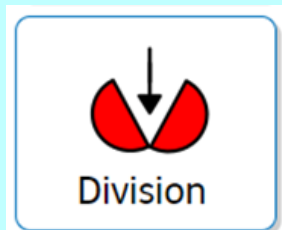
Multiply decimal numbers by whole numbers:

Always starting
with the
smallest value

T	O	.	ths
	2	.	5
X	7		

T	O	.	ths	hths
	9	.	1	5
X	3			

Y6 Progression: Multiplying decimals



Year 5

Year 6

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

Multiply and divide numbers mentally drawing upon known facts

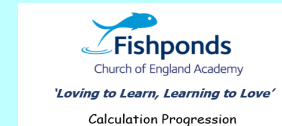
Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context



Year 5 & 6 heavily focuses on formal methods

Divide whole numbers and those involving decimals by 10, 100 and 1000

Multiplying and Dividing by 10, 100 and 1000

10 000	1000	100	10	1	●	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
			2	6	●			

We do not move the decimal point - it always stays in the same place.

Dividing

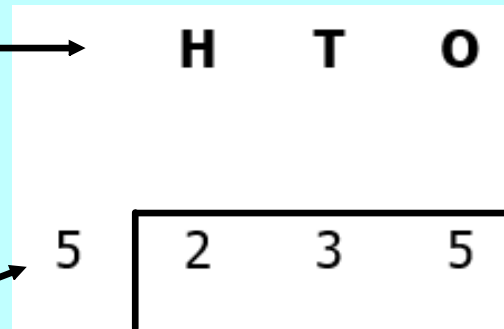
$\div 10$ digits move RIGHT 1 space
 $\div 100$ digits move RIGHT 2 spaces
 $\div 1000$ digits move RIGHT 3 spaces

➔

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division:

Always starting
with the largest
value

How many
times does ___
go in?



Divide numbers up to 4 digits by a one-digit number using the formal written method of short division with remainders:

	Th	H	T	O
7	3	7	2	1

Progression: interpreting remainders

As a decimal:

	Th	H	T	O
	0	5	3	1
7				
	3	37	22	11

As a fraction:

	Th	H	T	O
	0	5	3	1
7				
	3	37	22	11

Y6 Progression: converting remainders in to decimals and fractions

Divide numbers up to 4 digits by a two-digit number using the formal written method of short division with remainders:

Multiples of 25:

25

50

75

100

125

150

175

	Th	H	T	O
<u>25</u>	2	5	6	7

Y6 Progression: dividing by a 2-digit number

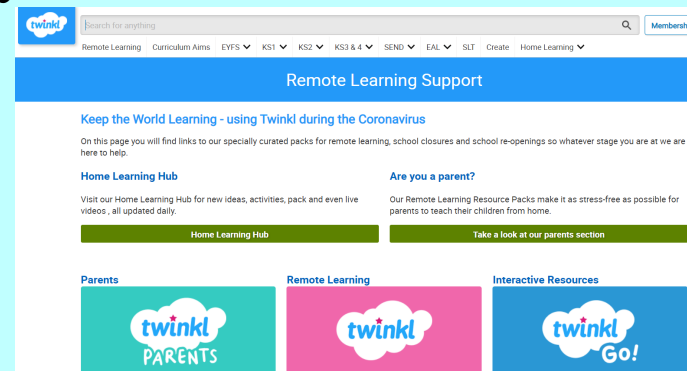
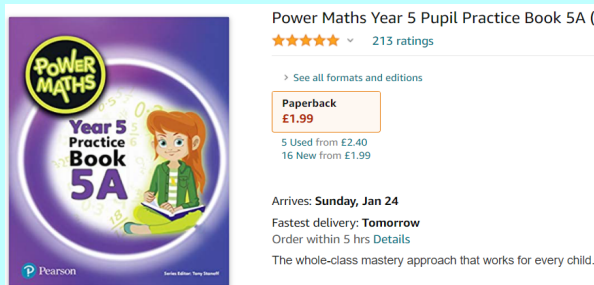
Divide decimals number by a whole number using a formal method of division:

$$\begin{array}{r} \mathbf{0} \quad \mathbf{.} \quad \mathbf{ths} \quad \mathbf{hths} \\ 4 \overline{) 2 \quad \mathbf{.} \quad \mathbf{0} \quad \mathbf{0}} \end{array}$$

Y6 Progression: dividing decimals

How can you support your child at home?

Practise books from Amazon



1.) $9,005 + 1,555 =$

2.) $6,813 + 2,534 =$

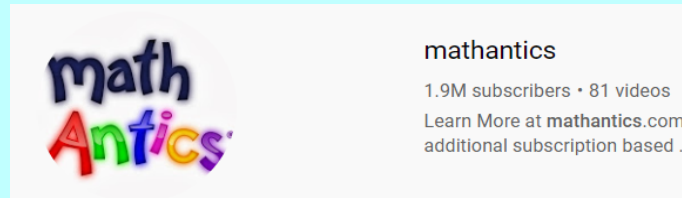
3.) $4,088 + 4,088 =$

Myminimaths.com -
daily arithmetic practise

Free parent twinkl account for
some free downloads



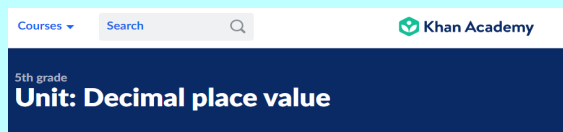
How can you support your child at home?



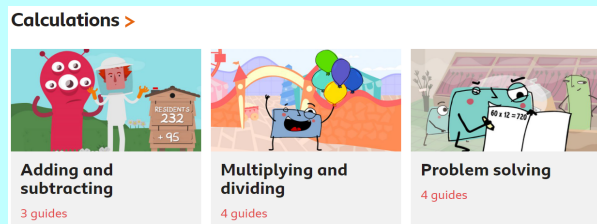
Youtube - mathantics



Mathsisfun.com - videos, games and worksheets



Khan Academy - videos and quizzes



BBC Bitesize - videos to support

