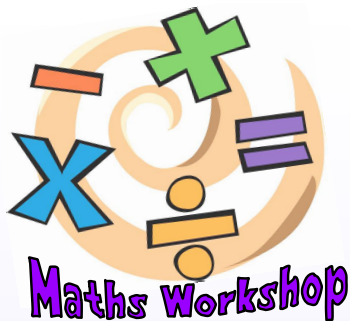




Maths Workshop



The purpose of this meeting is to.....

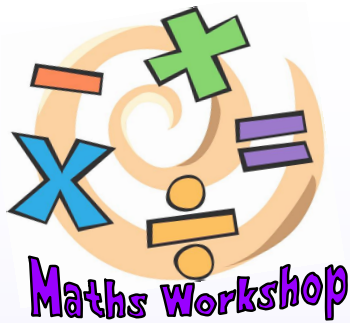
- Update you on how Maths is taught in Primary Schools
- Explain the calculation methods your children are taught (or will be taught) in school
- Help you to help your children in Maths
- Encourage you to have a go!



Why have calculation methods changed in Primary Schools?

Maths for Mums and Dads

It's the difference between providing someone with a list of instructions for getting from A to B and providing them with a map. With a list of instructions, making a mistake can send you down the wrong path and it's difficult to get back on track. With a map you can plot your own most sensible route through. We are teaching mathematical maps rather than a list of directions.



2014 National Curriculum – What has changed?

- Expectations have increased
- Multiplication and division facts
 - Year 2 – 2, 5, 10
 - Year 3 – 3, 4, 8
 - Year 4 – all up to 12×12
- More emphasis on **formal** written methods of calculation - tested at the end of Year 6

Addition

Year 3

- Add numbers with up to three digits, using the efficient written methods of column addition ($347 + 125$)

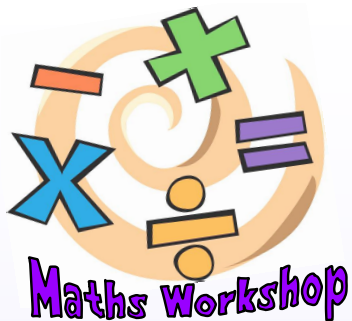
Year 4

- Add numbers with up to 4 digits using the efficient written methods of column addition where appropriate ($4,352 + 2,839$), including decimals in form of money

Year 5

- Add whole numbers with more than 4 digits, including using the efficient written method of column addition ($475,533 + 24,644$)

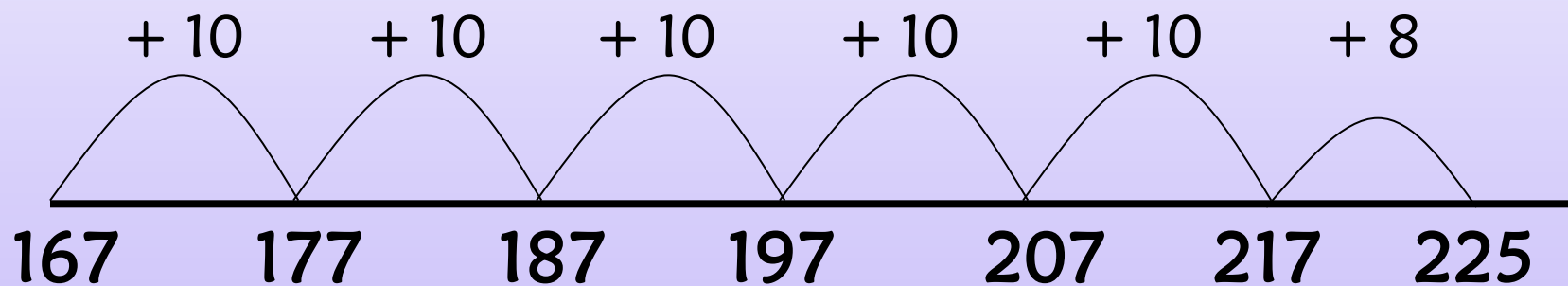
In all year groups, mental calculation and problem solving in context is key.



Addition

Numberline method : Informal

$$167 + 58 = 225$$





Addition

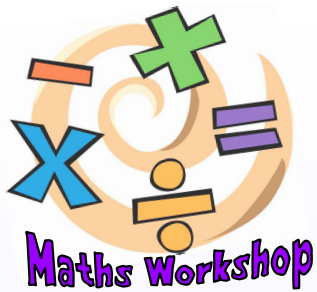
Partitioning - Pulling the numbers apart: Informal

$$85 + 47 = 80 + 5 + 40 + 7 =$$

$$80 + 40 = 120$$

$$5 + 7 = 12$$

$$120 + 12 = 132$$

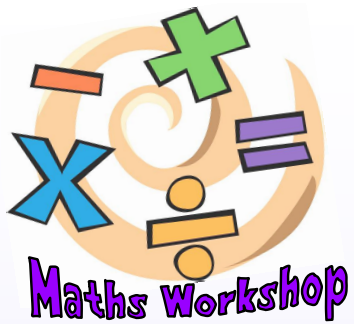


Addition

Expanded column method – Informal

$$167 + 58 =$$

	<i>H</i>	<i>T</i>	<i>O</i>
	1	6	7
+	5	8	
<hr/>			
		1	5
	1	1	0
	1	0	0
<hr/>			
	2	2	5



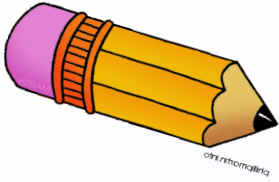
Addition

Column method : Formal

$$167 + 58 = 225$$

$$\begin{array}{r} 167 \\ + 58 \\ \hline 225 \\ \hline \end{array}$$

Red arrows indicate the column-wise addition process, pointing from the top row to the bottom row. Red numbers '1' are placed below the first two columns, indicating the carry-over from the tens and hundreds places.



Your turn....

Have a go at these, using informal or formal methods.....

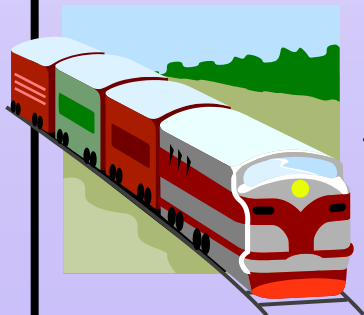
$$87 + 25 = 112 \qquad 934 + 298 = 1,232$$

$$235 + 192 + 88 = 515$$

$$85,546 + 23,628 = 109,174$$

A train travels 48 miles to its first stop, then 67 miles to its second stop and finally 123 miles to its third stop. How far did it travel altogether?

238 miles



Subtraction

Year 3

- Subtract numbers with up to three digits, using the efficient written methods of column subtraction ($347 - 125$)

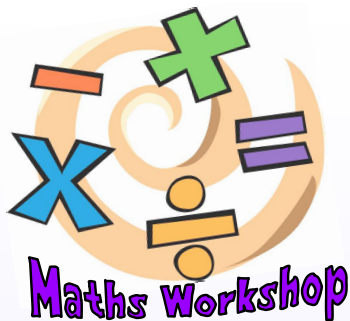
Year 4

- Subtract numbers with up to 4 digits using the efficient written methods of column subtraction where appropriate ($4,352 - 2,839$) including decimals in form of money

Year 5

- Subtract whole numbers with more than 4 digits using the efficient written method of column subtraction ($475,533 - 24,644$)

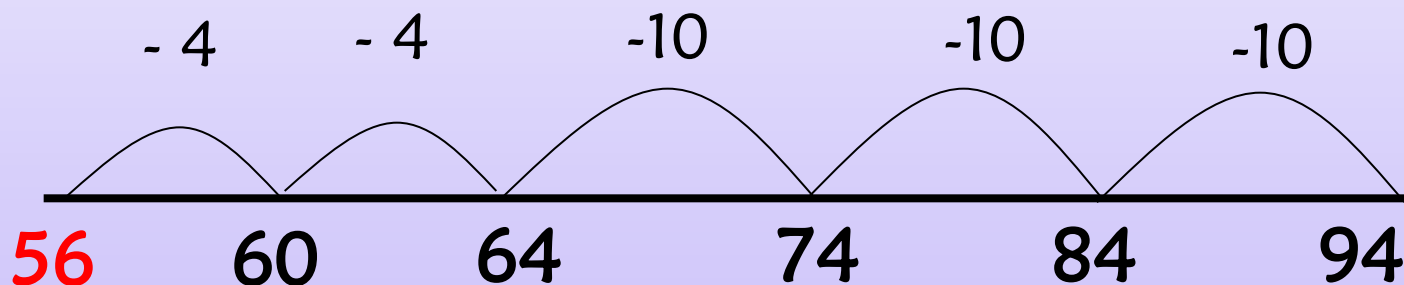
In all year groups, mental calculation and problem solving in context is key.



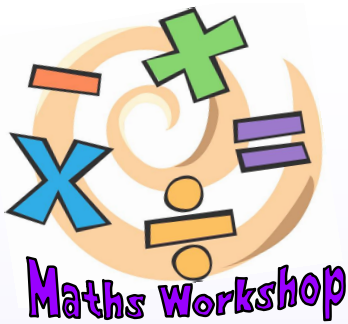
Subtraction

Numberline method – Counting back: Informal

$$94 - 38 = 56$$



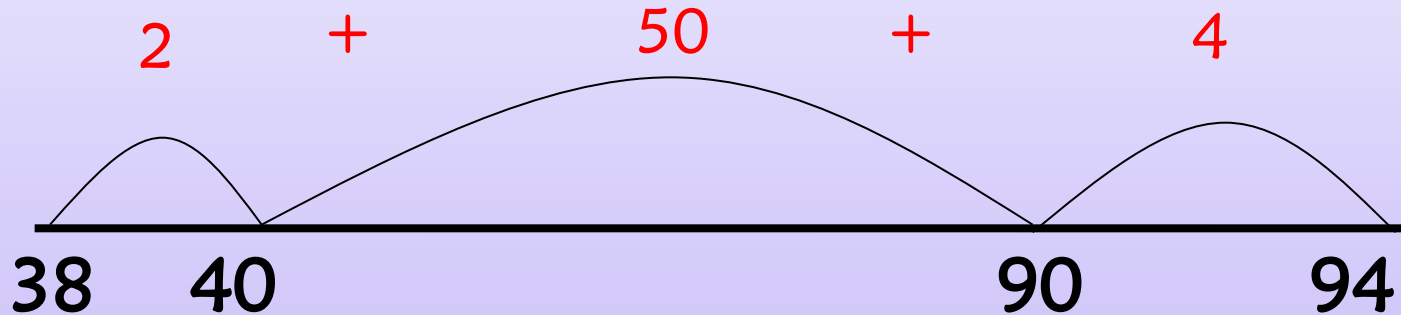
Mental maths skills are vital.



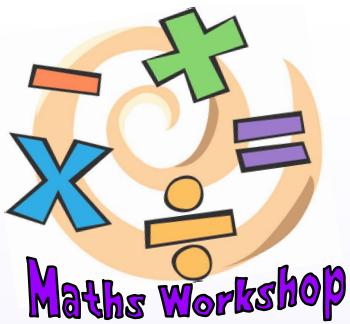
Subtraction

Numberline method – Finding the difference: Informal

$$94 - 38 = 56$$



Most children find it easier to count on and find the difference.



Subtraction

Decomposition – Pulling the number apart: Informal

$$754 - 286 = 468$$

$$\begin{array}{r} \overset{100}{\curvearrowright} \overset{10}{\curvearrowright} \\ \textcolor{red}{\cancel{7}00} \textcolor{red}{\cancel{5}40} \textcolor{red}{\cancel{4}0} \\ - 200 80 6 \\ \hline \end{array}$$

$$400 + 60 + 8 = 468$$

Introduction to column subtraction.

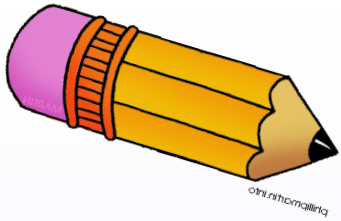


Subtraction

Column method : Formal method

$$754 - 286 = 468$$

$$\begin{array}{r} \overset{6}{\cancel{7}} \overset{14}{\cancel{5}} \overset{1}{4} \\ - 286 \\ \hline 468 \end{array}$$



Your turn....

Have a go at these, using informal or formal methods

$$93 - 57 = 36$$

$$675 - 389 = 286$$

$$14,433 - 2,746 = 11,687$$



A jug has 1345ml of juice in it.
743ml of juice is poured out, how
much is left?

602ml

Multiplication

Year 3

- Calculate using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using **informal** mental methods and progressing to efficient written methods (24×3)

Year 4

$\times 2, \times 5, \times 10, \times 3, \times 4, \times 8$

- Multiply two-digit and three-digit numbers by a one-digit number using **formal written** layout (64×9 or 242×7)

Year 5

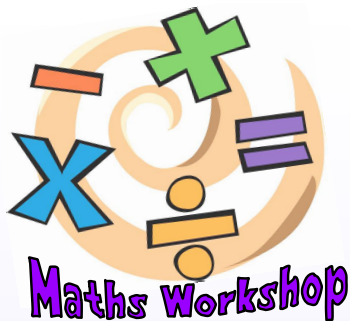
all facts up to 12×12

- Multiply numbers up to 4 digits by a one- or two-digit number using an **efficient written method**, including **long multiplication** for two-digit numbers ($4,563 \times 8$ or $4,563 \times 32$)

Year 6

- Multiply multi-digit numbers up to 4 digits (including decimals) by a two-digit whole number using the **efficient written method** of **long multiplication** ($4,563 \times 32$)

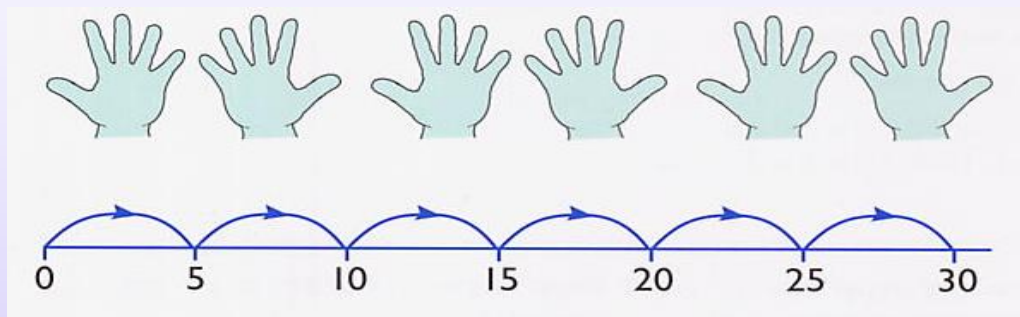
In all year groups, mental calculation and problem solving in context is key.



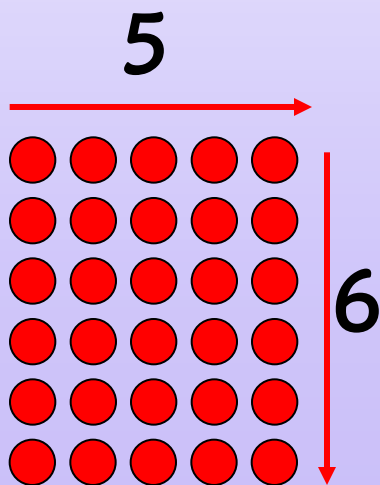
Understanding Multiplication

Repeated Addition

$$6 \times 5 = 5 + 5 + 5 + 5 + 5 + 5 = 30$$

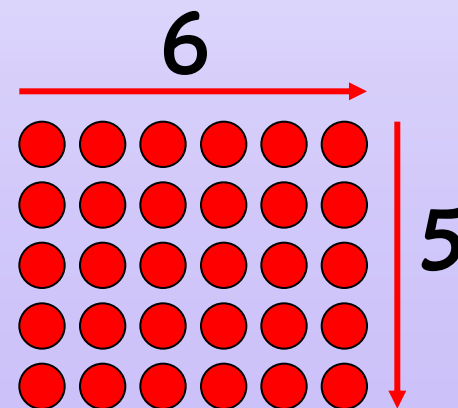


Arrays



6 rows of 5

5 rows of 6





Multiplication

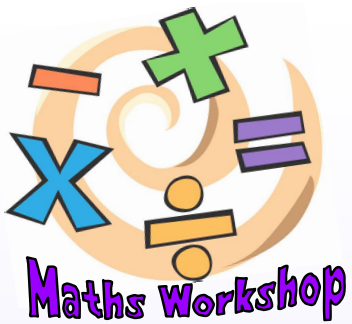
Grid Method : Informal

x	30	2	
8	240	16	

$$32 \times 8 = 256$$

$$\begin{array}{r} 240 \\ + 16 \\ \hline 256 \end{array}$$

Children **MUST** know
their times tables facts.



Multiplication

Grid multiplication to expanded short multiplication

x	30	2	
8	240	16	

$$\begin{array}{r} 32 \\ \times 8 \\ \hline 16 \\ 240 \\ \hline 256 \end{array}$$

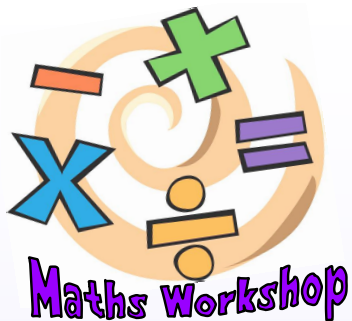


Multiplication

Short Multiplication : Formal

$$\begin{array}{r} 458 \\ \times 7 \\ \hline 3206 \\ \hline \end{array}$$

4 5



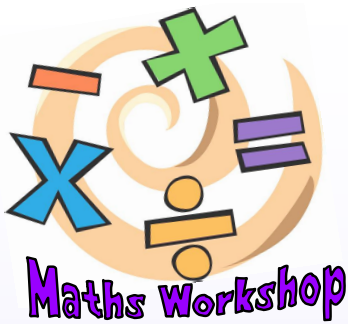
Multiplication

Long Multiplication -

Expanded method:

Informal

$$\begin{array}{r} \begin{array}{cc} 56 \\ \times 27 \\ \hline \end{array} \\ \begin{array}{r} 42 \\ 350 \\ 120 \\ 1000 \\ \hline 1512 \\ 1 \end{array} \end{array}$$

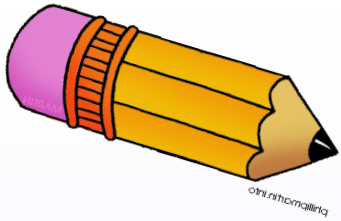


Multiplication

Long Multiplication :

Formal

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 392 \\ 4 \\ 1120 \\ \hline 1512 \\ 1 \end{array}$$



Your turn....

Have a go at these, using formal or informal methods

$$47 \times 7 = 329$$

$$62 \times 23 = 1,426$$

$$171 \times 134 = 22,914$$



Pot plants cost £3.65. How much would it cost to buy 7 pot plants?

£25.55

Division

Year 3

- Calculate using the division facts that they know using **informal mental methods** and progressing to efficient written methods ($80 \div 4$)

Year 4

- Divide numbers using **short division** with exact answers when dividing by a one-digit number ($144 \div 9$)

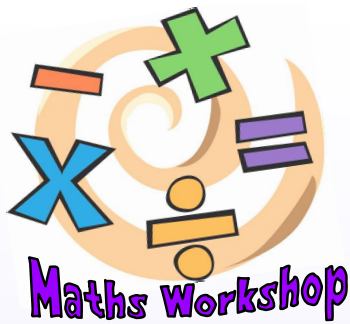
Year 5

- Divide numbers up to 4 digits by a one-digit number using the **efficient written method of short division** and interpret remainders appropriately for the context ($4,532 \div 7$)

Year 6

- Divide numbers up to 4 digits by a two-digit whole number using the **efficient written method of long division**, and interpret remainders for the context ($4,532 \div 27$)

In all year groups, mental calculation and problem solving in context is key.



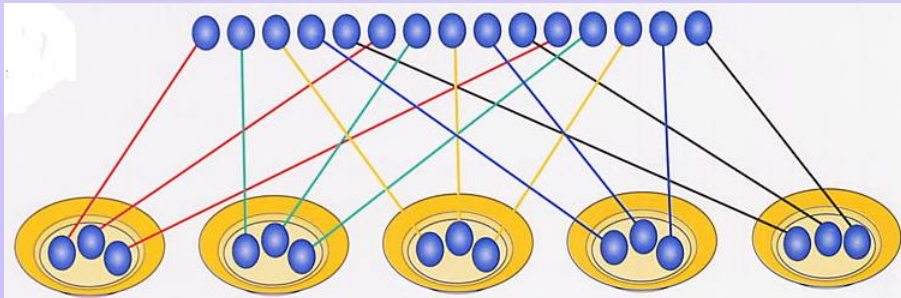
Division

Informal methods

Good for understanding division.

Children must learn division facts off by heart.

Counting up in multiples



Sharing into groups

Repeated subtraction



Short division : Formal

$$325 \div 6 = 54 \text{ r } 1$$

$$\begin{array}{r} 054 \text{ r } 1 \\ 6 \overline{) 325} \end{array}$$

The diagram illustrates the short division process. The divisor 6 is on the left. The dividend 325 is written under the division bar. The quotient 054 is written above the bar, and the remainder 1 is written to the right. Red arrows indicate the steps: from 3 to 3, from 3 to 2, and from 2 to 5, showing the progression of the division process.

Also known as bus stop division. This method relies on confident recall of division facts.



Division – Chunking : Formal

$$432 \div 15 = 28 \text{ r } 12$$

$$\begin{array}{r} 15 \overline{) 432} \\ - 300 \quad (20 \times 15) \\ \hline 132 \\ - 120 \quad (8 \times 15) \\ \hline 12 \end{array}$$

$$1 \times 15 = 15$$

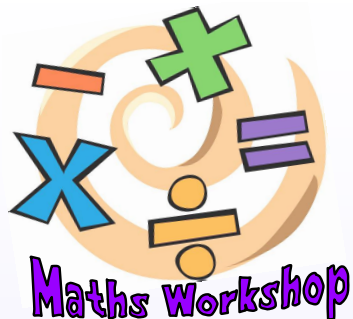
$$2 \times 15 = 30$$

$$3 \times 15 = 45$$

$$4 \times 15 = 60$$

$$5 \times 15 = 75$$

This method relies on times tables facts and confident subtraction.



Long Division: Formal

$$422 \div 25 = 16 \text{ r } 22$$

$$\begin{array}{r} 016 \\ 25 \overline{) 422} \\ \underline{- 25} \\ 172 \\ \underline{- 150} \\ 22 \end{array}$$

$$1 \times 25 = 25$$

$$2 \times 25 = 50$$

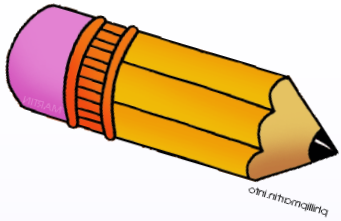
$$3 \times 25 = 75$$

$$4 \times 25 = 100$$

$$5 \times 25 = 125$$

$$6 \times 25 = 150$$

$$7 \times 25 = 175$$



Your turn....

Have a go at these, formal or informal methods

$$243 \div 7 = 34 \text{ r}5 \quad 672 \div 21 = 32$$

$$486 \div 9 = 54 \quad 4,251 \div 15 = 283 \text{ r}6$$



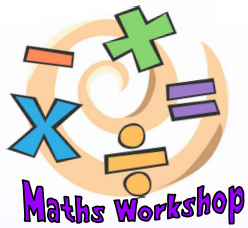
14 people share a lottery winning of £728. How much do they receive each?

£52



Final points....

- Children will vary on the methods they prefer
- Teachers use their judgement to know when a child is ready to move onto the next stage of calculation
- A good grasp of mental maths is vital for success in written calculations
- Encourage your child to teach you!

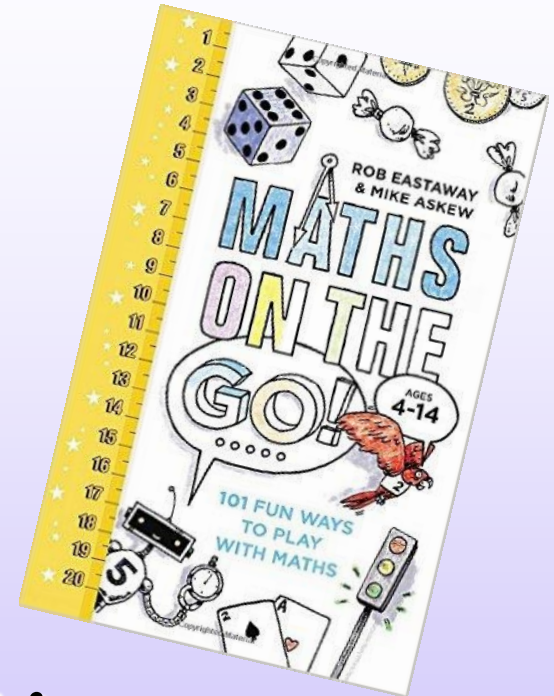
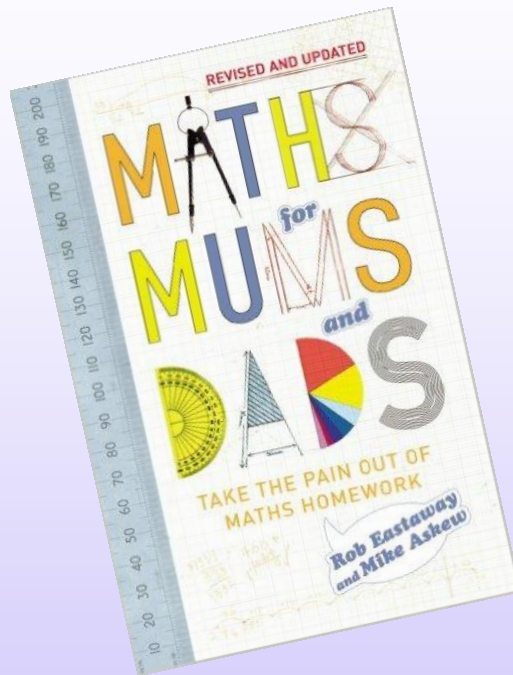


Maths for Mums and Dads

Maths On the Go - Activities

New and Updated
for 2014

Rob Eastaway
and
Mike Askew



National Numeracy Family Toolkit

www.nationalnumeracy.org.uk/family-maths-toolkit

Oxford Owl Maths

www.oxfordowl.co.uk/home/maths-owl/maths