



# Maths Workshop



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

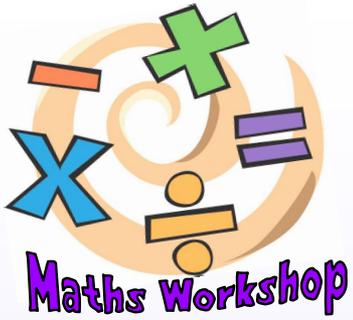
- Update you on how Maths is taught in Primary Schools
- Explain the calculation methods your children are taught (or will be taught) in school
- Help you to help your children in Maths
- Encourage you to have a go!



# 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  $12 \times 12$
- 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 ( $475,533 + 24,644$ )

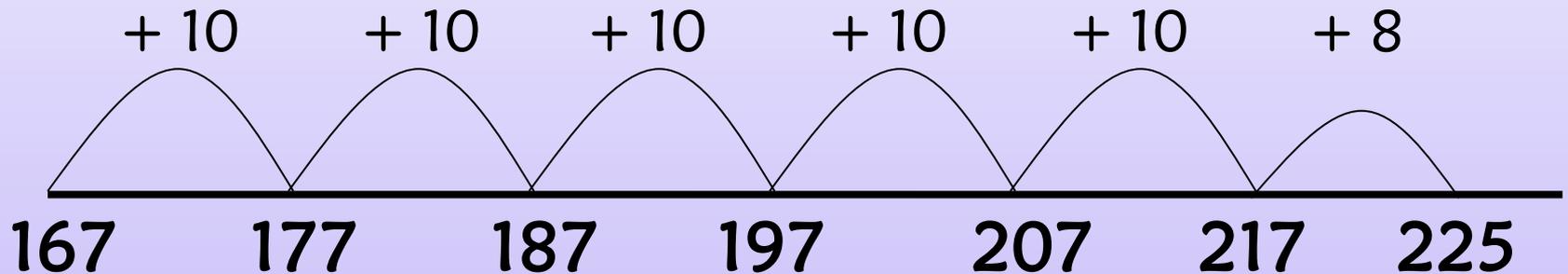
In all year groups, mental calculation and problem solving in context is key.

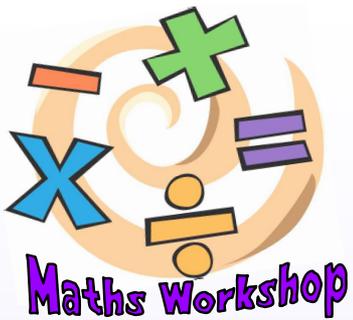


# Addition

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		
		15		
	1	1	0	
	1	0	0	
	2	2	5	

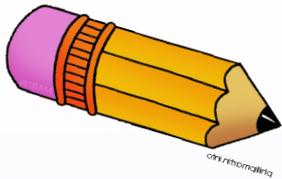


# Addition

Column method : Formal

$$167 + 58 = 225$$

$$\begin{array}{r} 167 \\ + 58 \\ \hline 225 \\ \hline 11 \end{array}$$



# Your turn....

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

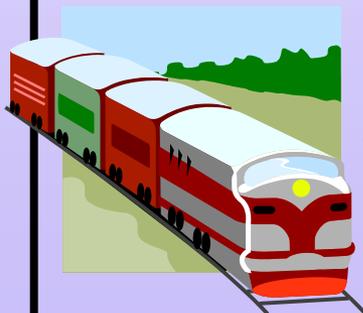
$$87 + 25 = 112 \qquad 934 + 298 = 1,232$$

$$235 + 192 + 88 = 515$$

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

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)

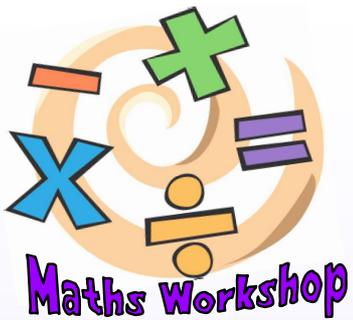
## Year 4

- 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)

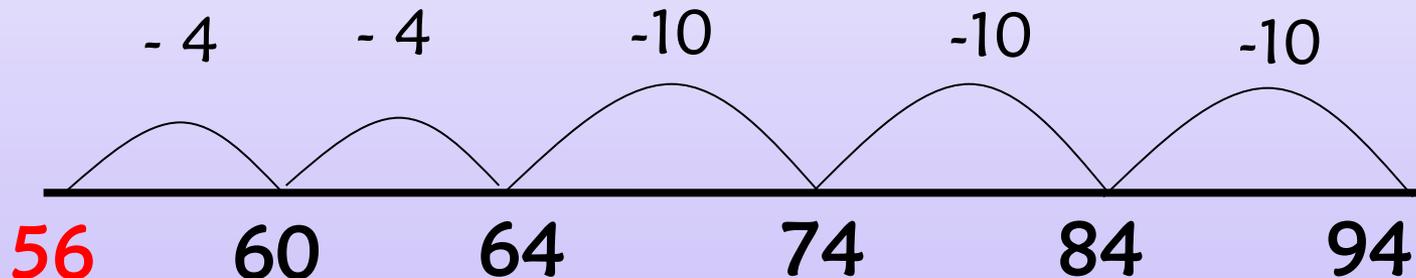
In all year groups, mental calculation and problem solving in context is key.



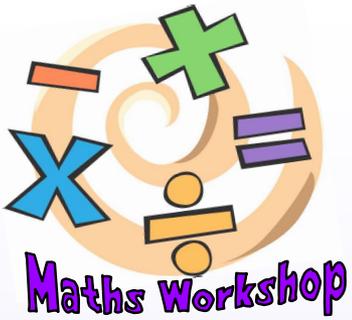
# Subtraction

Numberline method – Counting back: Informal

$$94 - 38 = 56$$



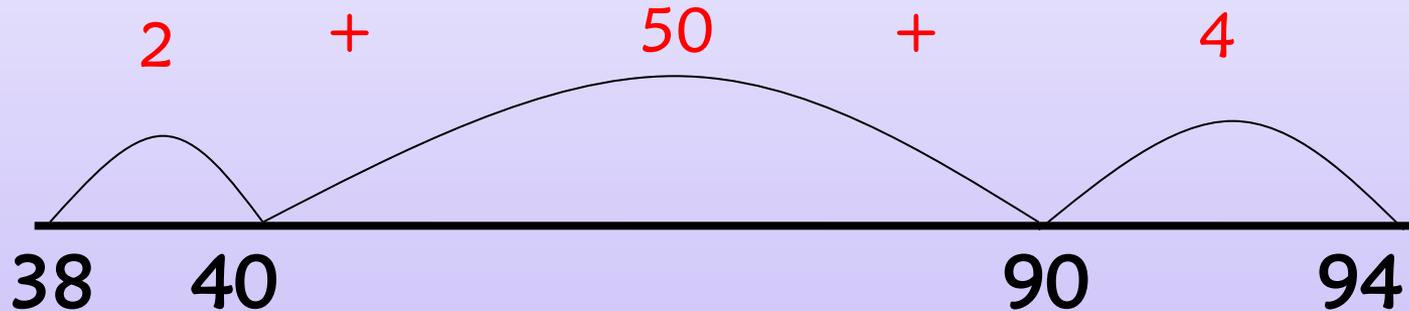
Mental maths skills are vital.



# Subtraction

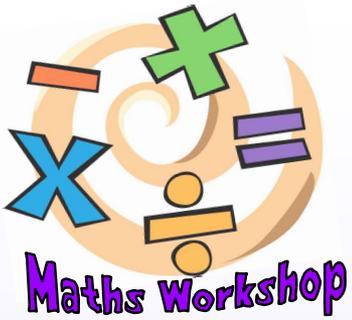
Numberline method – Finding the difference: Informal

$$94 - 38 = 56$$



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



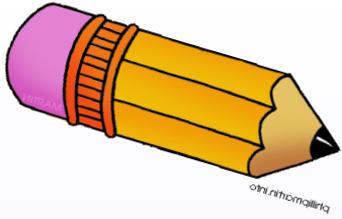


# Subtraction

Column method : Formal method

$$754 - 286 = 468$$

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



# 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 ( $24 \times 3$ )

## 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 ( $64 \times 9$  or  $242 \times 7$ )

## Year 5

all facts up to  $12 \times 12$

- 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** ( $4,563 \times 32$ )

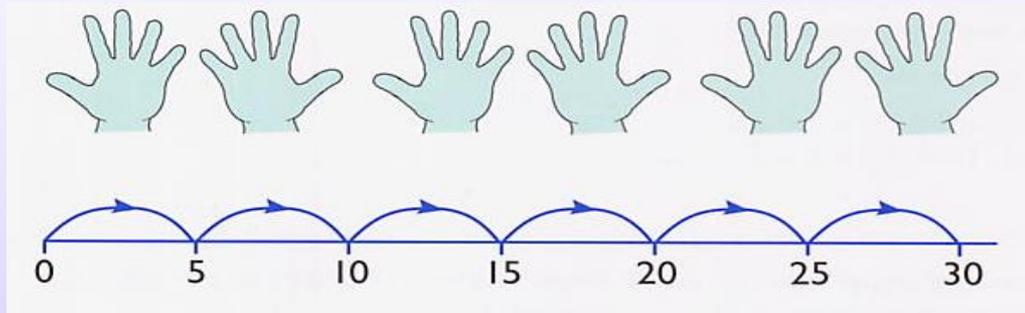
In all year groups, mental calculation and problem solving in context is key.



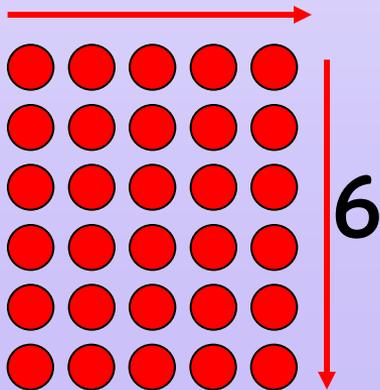
# Understanding Multiplication

## Repeated Addition

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



5

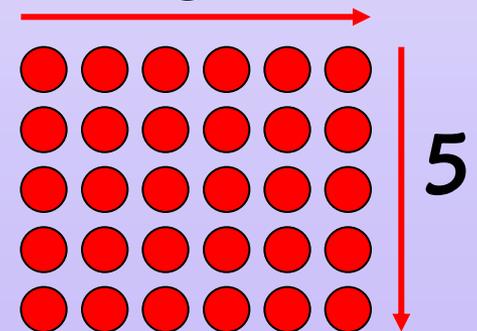


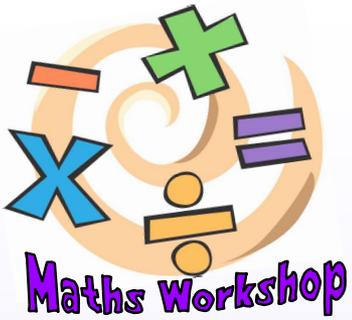
### Arrays

6 rows of 5

5 rows of 6

6





# Multiplication

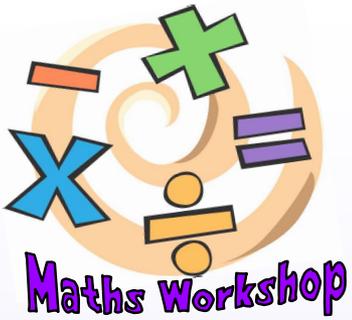
## Grid Method : Informal

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

$$\begin{array}{r} 458 \\ \times 7 \\ \hline 3206 \\ \hline 4 \quad 5 \end{array}$$

The diagram illustrates the formal short multiplication of 458 by 7. The numbers are aligned to the right. A horizontal line is drawn under the 458. Three red arrows point from the 7 to the 8, 5, and 4 respectively. The product 3206 is written below the line. A second horizontal line is drawn under the 3206. The numbers 4 and 5 are written in red below the second line, representing the carry values.



# Multiplication

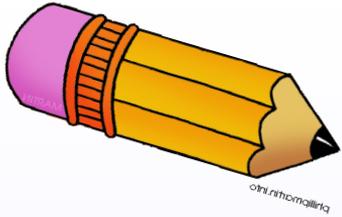
Long Multiplication -

Expanded method:

Informal

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





# 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 ( $144 \div 9$ )

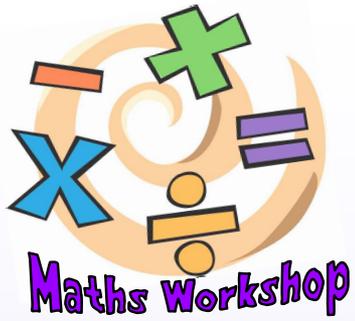
## Year 5

- 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.



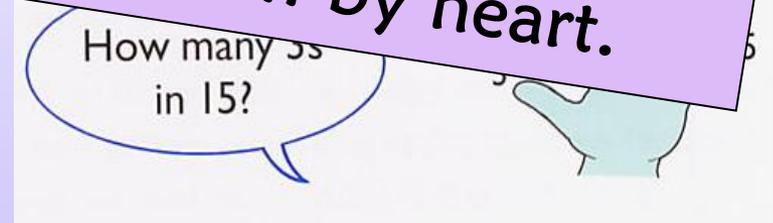
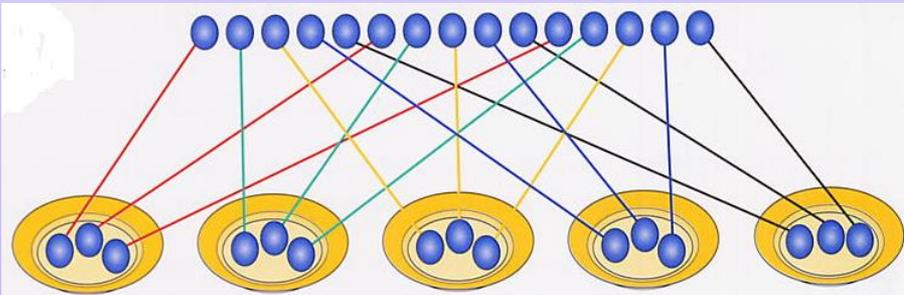
# Division

## Informal methods

Good for understanding division.

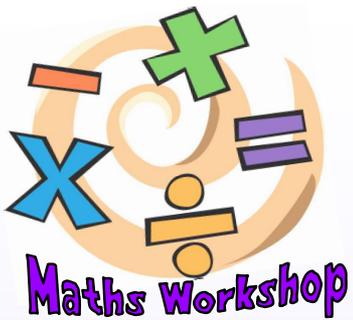
Children must learn division facts off by heart.

Counting up in multiples



Sharing into groups

Repeated subtraction



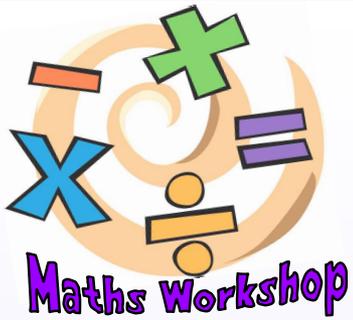
## Short division : Formal

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

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

The diagram shows the formal short division process. The divisor 6 is on the left. The dividend 325 is written below a horizontal line. The quotient 054 and remainder r 1 are written above the line. Red arrows indicate the steps: from 3 to 32, from 32 to 325, and from 325 to the final remainder 1.

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

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

$$\begin{array}{r} 016 \\ 25 \overline{) 422} \\ \underline{- 25} \phantom{0} \\ 172 \\ \underline{- 150} \\ 22 \end{array}$$

The diagram shows the long division process for 422 divided by 25. The quotient 016 is written above the dividend 422. Red arrows indicate the steps: one arrow points from the 25 in the divisor to the 4 in the dividend, another from the 25 to the 22, and a third from the 25 to the 22. A vertical arrow points down from the 2 in the dividend to the 2 in the remainder.

$$1 \times 25 = 25$$

$$2 \times 25 = 50$$

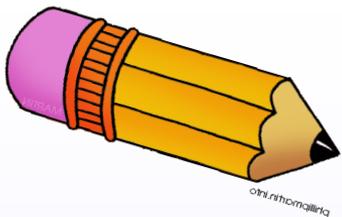
$$3 \times 25 = 75$$

$$4 \times 25 = 100$$

$$5 \times 25 = 125$$

$$6 \times 25 = 150$$

$$7 \times 25 = 175$$



# 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**



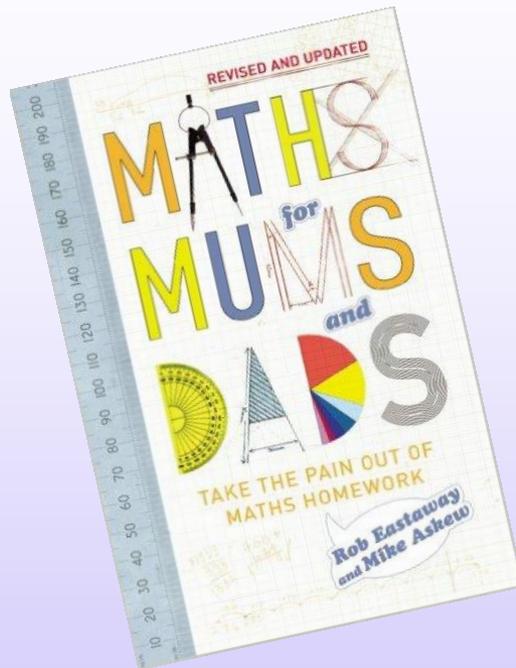
# Final points....

- 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!



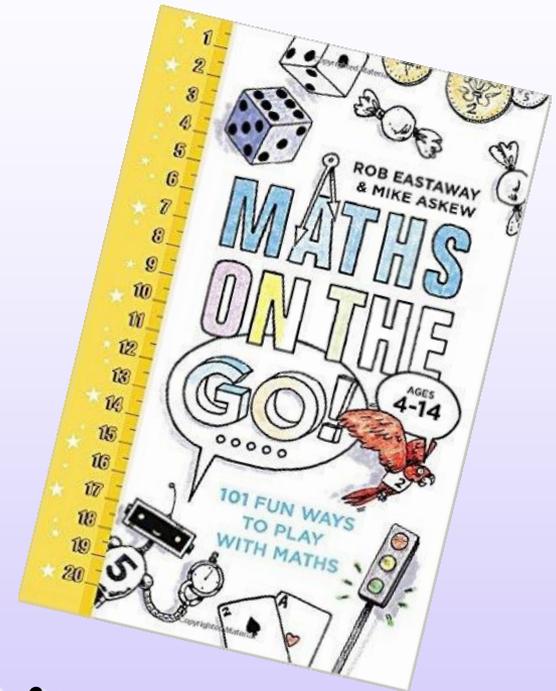
# Maths for Mums and Dads

## 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](http://www.nationalnumeracy.org.uk/family-maths-toolkit)

## Oxford Owl Maths

[www.oxfordowl.co.uk/home/maths-owl/maths](http://www.oxfordowl.co.uk/home/maths-owl/maths)