

# KS2 Mathematics Parents Workshops



Bardfield  
Academy

# Aims

- ▶ New curriculum for mathematics at KS2
- ▶ Standard written method for KS2
- ▶ Mental calculation strategies used at KS2



# New Primary Mathematics Curriculum

- ▶ Higher expectations overall – benchmarked against other nations
- ▶ Conceptual development of number addressed in more detail
- ▶ Fewer things in more depth
- ▶ All pupils expected to build firm foundations to help become secondary ready


# Aims of the National Curriculum

- ▶ Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to **recall and apply knowledge rapidly and accurately**.
- ▶ Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- ▶ Can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

# What do we actually teach.....

- ▶ Place Value to 10,000,000 and to thousandths in decimal places
- ▶ Rounding any number to 10, 100, 1000, 10,000, 100,000 and decimal numbers to whole numbers, one decimal point, two decimal points
- ▶ Roman numerals to 1000
- ▶ Negative numbers in context (temperature)
- ▶ Multiplication 4/5 digit (whole numbers and decimal numbers) numbers by 2 digit numbers
- ▶ Long Division of 4 digit numbers by 2 digit numbers
- ▶ Fractions, Decimal and Percentages Equivalence, amounts of
- ▶ Addition and subtraction to 10,000,000

# What do we actually teach.....

- ▶ Time/Interpreting Timetables
  - ▶ Measurement ( mass, length, capacity, temperature, perimeter, area, volume, imperial unit of measure)
  - ▶ Money– budgeting
  - ▶ Problem solving–words problems
  - ▶ Ratio and Proportion–Year 6 only
  - ▶ Statistics
  - ▶ Geometry –Shape and space, Angles
  - ▶ Geometry–Co–ordinates
  - ▶ Alegbra
- 



End of KS2– Summer Term 1

Children will have to sit 3  
mathematics papers:

1 Arithmetic paper

2 Mathematical Reasoning



2

$$123 \times 2 =$$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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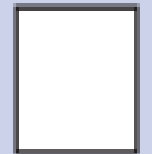
23

x

5 4

2 3

Show  
your  
method



2 marks

# Number and Place Value

By the end of Year 6 children should be able to order, compare, read and write in digits and words numbers to 10,000,000

Count

Year 3–Numbers to 1,000

Year 4–Numbers to 1,000

Year 5–Numbers to 1,000,000

Year 6– Numbers to 10,000,000

# Roman Numerals

By the end of Year 6 children should be able to read Roman Numerals in the thousands.

Year 4–Numerals to 100

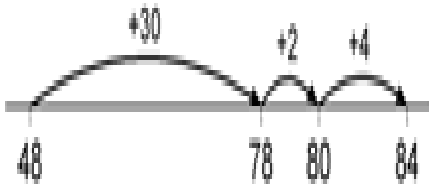
Year 5/6–Numerals to 1000

Addition and Subtraction at KS2

# Calculation Strategies from Year 3 to Year 6

# Partitioning and using a number line –Year 2 /3

$$48 + 36 =$$




# Partitioning into tens and ones– Year 3

$$47 = 40 + 7$$

$$\begin{array}{r} +76 \\ \hline \end{array} \quad \begin{array}{r} 70 + 6 \\ \hline \end{array}$$

$$110 + 13 = 123$$

# Expanded Addition pre place holder–Year 3

$$\begin{array}{r} 47 \\ + 76 \\ \hline 13 \\ 110 \\ \hline 123 \end{array}$$




# Expanded Addition Year 3 / 4

$$\begin{array}{r} \text{T} \quad 0 \\ 3 \quad 6 \\ + 4 \quad 1 \\ \hline \\ \hline 7 \\ 7 \quad 0 \\ \hline 7 \quad 7 \end{array}$$



# Formal Written Addition

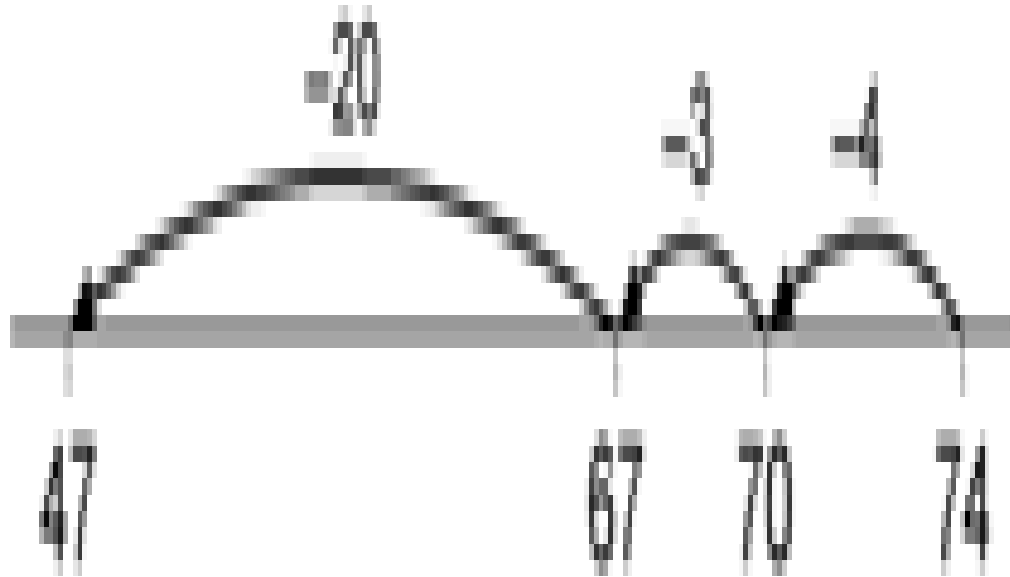
789 + 642 becomes

$$\begin{array}{r} \phantom{0}789 \\ + \phantom{0}642 \\ \hline 1431 \\ \hline \phantom{0}1 \phantom{0}1 \end{array}$$

Answer: 1431

# Subtracting using a number line

$$74 - 27 =$$



# Subtracting using a number line

326-178 could be recorded as:



# Expanded Column Subtraction

$$\begin{array}{r} 700 + 40 + 1 \\ - 300 + 60 + 7 \\ \hline \end{array}$$

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

# Formal Written Subtraction

Language here  
is important,  
the children  
are not  
borrowing they  
are exchanging  
value

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

# Multiplication and Division

Partitioning to Multiply  
Year 3 and 4

Understanding of place value is essential

$$\begin{array}{r} 40 \\ \downarrow \\ 240 \end{array} \quad \begin{array}{r} 43 \\ + \\ 3 \\ \downarrow \\ 18 \end{array} \quad \begin{array}{r} \times 6 \\ = 258 \end{array}$$



# Multiplication and Division

Partitioning to Multiply

Year 3 and 4

Understanding of place value is essential

$$43 \times 6 \rightarrow 40 \times 6 = 240$$

$$3 \times 6 = 18$$

$$\text{So } 43 \times 6 = 258$$

# Grid Method

| $\times$ | 7   |
|----------|-----|
| 30       | 210 |
| 8        | 56  |
|          | 266 |



|          | $30 + 8$ |
|----------|----------|
| $\times$ | 7        |
|          | 210      |
|          | 56       |
|          | 266      |

# Expanded Short Division Method

Years 3, 4 and 5

$$\begin{array}{r} 30 + 8 \\ \times \quad 7 \\ \hline 210 \\ 56 \\ \hline 266 \end{array}$$

$$\begin{array}{l} 30 \times 7 = 210 \\ 8 \times 7 = 56 \end{array}$$

$$\begin{array}{r} 38 \\ \times \quad 7 \\ \hline 210 \\ 56 \\ \hline 266 \end{array}$$

# Short Multiplication

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \\ \hline 5 \end{array}$$

# Long Multiplication –The Process

| ×  | 20   | 7   |      |
|----|------|-----|------|
| 50 | 1000 | 350 | 1350 |
| 6  | 120  | 42  | 162  |
|    |      |     | 1512 |

1



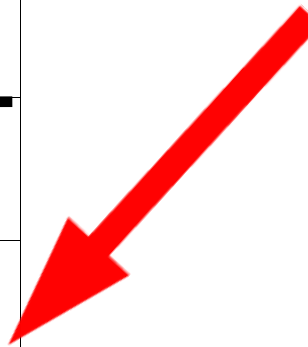
$$\begin{array}{r}
 56 \\
 \times 27 \\
 \hline
 1000 \\
 120 \\
 350 \\
 \underline{42} \\
 1512 \\
 1
 \end{array}$$

$$\begin{array}{l}
 50 \times 20 = 1000 \\
 6 \times 20 = 120 \\
 50 \times 7 = 350 \\
 6 \times 7 = 42
 \end{array}$$

# Long Multiplication

|   |   |   |   |   |   |
|---|---|---|---|---|---|
|   |   |   | 1 | 2 |   |
|   |   | 1 | 1 | 2 | 4 |
| × |   |   |   | 2 | 6 |
|   |   |   |   |   |   |
|   |   | 6 | 6 | 4 | 4 |
| + | 2 | 2 | 4 | 8 | 0 |
|   |   |   |   |   |   |
|   | 2 | 9 | 1 | 2 | 4 |
|   |   |   |   |   |   |
|   |   | 1 | 1 |   |   |

Children  
must  
remember  
to enter a  
place  
holder



# Division in KS1

## Inverse operations

If you know:  $2 \times 6 = 12$

$$6 \times 2 = 12$$

$$12 \div 2 = 6$$

$$12 \div 6 = 2$$



# Expanded Method by Chunking

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

Answer: 32 R 4

# Short Division

$$\begin{array}{r} 97 \\ 3 \overline{) 2921} \end{array}$$

# Long Division

$$24 \overline{) 560}$$

$$\begin{array}{r} 20 - 480 \\ \hline 80 \end{array}$$

$$24 \times 20$$

$$\begin{array}{r} 3 \quad 72 \\ \hline 8 \end{array}$$

$$24 \times 3$$

Answer: 23 R 8

# Long Division

how many per store?  $\longrightarrow$  **3,524 R 6**

24  
48  
72  
96  
120  
144  
168  
192  
216  
240

$$\begin{array}{r} 24 \overline{) 85,582} \\ \underline{72} \phantom{0} \downarrow \\ 125 \phantom{0} \downarrow \\ \underline{120} \phantom{0} \downarrow \\ 58 \phantom{0} \downarrow \\ \underline{48} \phantom{0} \downarrow \\ 102 \phantom{0} \downarrow \\ \underline{96} \\ 6 \end{array}$$

# Schools Calculation Policy

The **updated** school mathematics policy which you will be able to obtain from the website (**very soon**) outlines the procedures for introducing and teaching the many mathematical concepts on the curriculum.

**However we do have a parents page which will contain this PPT this week.**

These are the methods that are currently to be taught and they are statutory.

# Mental Mathematics

It is essential children have secure knowledge and recall of mental facts including: –

Place Value including decimals

Number bonds

Times tables from 0 to 12 – Corresponding division facts.

Why is mental calculation important?

$$\begin{array}{r} 2000 \\ - 102 \\ \hline \end{array}$$

How would ~~approach~~ this problem?



# Making Links

$$25 \times 8 =$$

Children relying on written procedures forget how much they can do mentally

25 x 8 is double 25 x 4, 25x2



# Multiplication and Division

Use known facts to find answers to multiplication and division problems

$$4 \times 8 = 2 \times 16 = 32$$

(doubling and halving)

$$9 \times 6 \text{ is } (10 \times 6) - 6 = 54$$

(rounding and compensating)

$$63 \div 7 = 9 \text{ because } 9 \times 7 = 63 \text{ (inverse)}$$


# Times Tables

This is a very key area for Bardfield Academy to highlight!

Count in multiples before using the times table facts 0, 3, 6, 9, 12

Knowing and embedding all facts leads to greater understanding of corresponding division facts

Times Tables knowledge is essential in understanding and applying that knowledge with questions relating factors, multiples, prime number, square numbers, fractions, decimals, percentages and equivalence between these.



# How can you help at home...

## Lots of practice

Playing games – cards, dominoes

Shopping –paying with actual money, savings accounts

Watching the weather report comparing temperatures around the world

Cooking – Any kind of practical activities involving mass, length and capacity that you can do at home will really benefit your child's understanding of these concepts

Telling the time –timing journeys, helps develop a concept of lengths of time.

Thank you!

Any Questions?