



Maths Upper School
Workshop-
multiplication and
division

The current curriculum, which came into force in September 2014, gives very clear guidance as to how we should be teaching addition, subtraction, multiplication and division.

Aims of this workshop:

To look at how we teach maths in our school and the methods we use.

To look at the progression of multiplication and division throughout our school

To give parents the opportunity to look at strategies we use in school in order to support their child/ children at home

What does the new curriculum say?

Aims:

"...all pupils to 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."

What has changed?

The main change in the new strategy is the renewed focus on formal written strategies. These methods are also introduced earlier than in the previous curriculum.

How does this impact the children?

Over the last couple of academic years we began to introduce these new methods to all year groups at BWJS.

Children will be using formal methods from Year 3 and will be less likely to use informal strategies such as number lines when multiplying or dividing.

There is a huge importance placed on learning times tables in the new curriculum. We fully support this and as well as all the class work we currently do on tables, will be introducing new challenges throughout the year

Expanded column method- ThHTUx U

$$4326 \times 7$$

<hr/>	
4326	
x 7	
<hr/>	
42	(7 x 6)
140	(7 x 20)
2100	(7 x 300)
28000	(7 x 4000)
<hr/>	
30282	
<hr/>	
1	

By this stage you would expect children to know or be able to derive quickly all multiplication facts to 12×12

As this stage is relatively time consuming you would expect to move quite quickly to the more compact method

Short multiplication

$$4326 \times 7$$

$$\begin{array}{r} 4326 \\ \times \quad 7 \\ \hline 30282 \\ \hline 214 \end{array}$$

Multiplication- TU x TU
Grid followed by expanded
long multiplication

24 x 33

x	20	4	
30	600	120	= 720
3	60	12	= 72
			= 792

	24	
x	33	
	12	(3 x 4)
	60	(3 x 20)
	120	(30 x 4)
	600	(30 x 20)
	792	

Should be taught separately to begin with so place value issues are not confused

Most common misconception is children not completing all of the calculation e.g. only doing 20 x 30 and 4 x 3

Long multiplication

24×33

$$\begin{array}{r} 24 \\ \times 33 \\ \hline 72 \\ 720 \\ \hline 792 \end{array}$$

124×26

65×82

Children also need to be competent at addition to be successful at this type of calculation

The majority of children will be working at this level of calculation during Year 5.

Division

Many children struggle with division. In order to ensure that they fully understand what division is they should be introduced to it practically, within a context e.g.

- Act it out
- Diagram/ array
- Linked to a table of multiples
- Recognition of importance of times tables.

The new curriculum is less specific when it comes to division, so we have created a progression throughout Year 3, 4 and 5.

Year 3	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
Year 4	divide numbers up to 3 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context. Solve problems involving multiplication and division and a combination of these. All tables up to 12×12 should be known by heart
Year 5	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 Solve problems involving multiplication and division and a combination of these, inc understanding the meaning of the equals sign
Year 6	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

Division of TU ÷ U (using chunking)

$$68 \div 5$$

$$\begin{array}{r} 13 \text{ r}3 \\ 5 \overline{)68} \\ \underline{50} \quad (10 \times 5) \\ 18 \\ \underline{15} \quad (3 \times 5) \\ 3 \end{array}$$

$$68 \div 3$$

Obviously good knowledge of times tables is crucial

We are aiming to teach the children to compact their chunking as much as possible

Short division of TU \div U

$98 \div 7$

$$7 \overline{) 98} \begin{array}{r} 14 \\ \end{array}$$

$137 \div 4$

$$4 \overline{) 137} \begin{array}{r} 34 \text{ r}1 \\ \end{array}$$

or $34 \frac{1}{4}$ or 34.25

Short division should be taught alongside chunking to begin with- children MUST understand the place value.

The majority of children in Year 4 will be confident in these calculations by the end of the year.

Division of HTU and ThHTU \div U

$246 \div 8$

$$\begin{array}{r} 30\text{r}6 \\ 8 \overline{) 246} \\ \underline{240} \quad (30 \times 8) \\ 6 \end{array}$$

$1492 \div 5$

$$\begin{array}{r} 298 \text{ r}2 \\ 5 \overline{) 1492} \\ \underline{1000} \quad (200 \times 5) \\ 492 \\ \underline{400} \quad (80 \times 5) \\ 92 \\ \underline{90} \quad (18 \times 5) \\ 2 \end{array}$$

Should go back to chunking method to ensure understanding before moving onto more digits.

Don't forget to use a context so rounding remainders up or down has meaning

Short division of HTU and ThHTU \div U

$$246 \div 8$$

$$\begin{array}{r} 030 \text{ r}6 \\ 8 \overline{)246} \end{array}$$

$$1492 \div 5$$

$$\begin{array}{r} 0298 \text{ r}2 \\ 5 \overline{)1492} \end{array}$$

Children often find this method challenging!

The majority of Year 5 children will be working at this level of calculation by the end of the year.

Children need to understand what they are doing and are not doing this process by rote.

Long division- HTU or ThHTU ÷ TU

$$432 \div 15$$

$$\begin{array}{r} 28 \text{ r}12 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

$$5246 \div 16$$

Some children may need to work out a list of multiples before they start.

Long division is taught in Year 6

Answers should be in fractions, decimals or remainders depending on context.

Context in division

There are very few questions in division that actually demand an answer in the form of a remainder.

Consider this question: $36 \div 5$

Discuss how these answers could all be correct:

7

7r 1

1

8

7.2

7 $\frac{1}{5}$

What answers do these questions demand?

36g of pasta was divided between 5 plates. What weight of pasta was put on each plate?

36 children are going on a camping trip. Tents take 5 people each. How many tents are needed?

5 children share 36 marbles between them. How many marbles are left over?

Chocolate truffles are packaged 5 to a bag. If you have 36 truffles, how many complete bags will be filled?

36 people each buy a slice of cake. Each whole cake can be cut into 5 slices. What fraction of cake is needed?

I have 36 stickers. I put 5 on each page. How many pages are filled and how many stickers are left over?

