



Maths

Booklet

Multiplication



Maples

The aim of this booklet is to outline what is expected by the end of the year. We have included some of the strategies that will be used in class so that support is given in the same way.

We have included some activities that can be done at home to help them develop fluency and understanding.

Multiplication Expected targets.

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- use their knowledge of the order of operations to carry out calculations involving the four operations
- multiply numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers.
- perform mental calculations, including with mixed operations and large numbers

Are you fluent enough in your times tables knowledge to complete Mr Lea's tables test in less than 5 minutes? Aim to have your name up on the Maths Elf's Roll of Honour before the end of Year 6.

Maples.

I can recall all my times facts and related division facts and related unit fraction facts.



Multiply multi-digit numbers up to 4 digits by a 2 digit number using the formal written method of long multiplication

Here's an example from the 2018 Arithmetic paper:

Step 1

$$\begin{array}{r} 785 \\ \times 23 \\ \hline 2355 \end{array}$$

Multiply 5 ones, 8 tens and 7 hundreds by 3
I put digits that are carried over at the top, to avoid confusion in step 2

Step 2

$$\begin{array}{r} 785 \\ \times 23 \\ \hline 2355 \\ 15700 \end{array}$$

Multiply 5 ones, 8 tens and 7 hundreds by 20
Before starting, put a zero in the ones column.
This slides the whole calculation one space to the left.
Children can multiply one digit by one digit, but they need to **remember the value of the digit they are multiplying**, for example by saying "20 x 80 = 600".

Step 3

$$\begin{array}{r} 785 \\ \times 23 \\ \hline 2355 \\ 15700 \\ \hline 18055 \end{array}$$

Add the products from step one and two together.

It is important to become efficient at this process, remembering the "slide" at step 2. In their SATS tests, the children are awarded two marks for a correct answer to this kind of question. They may be awarded one mark for a correct method, even if they get the answer wrong.

Children should learn that calculations such as 4.56×35 can be performed using this method as well.

A context could be the total cost of a school trip for a class of 35 with a price of £4.56 per child

Children should learn the acronym "BIDMAS" which stands for Brackets, Indices, Division and Multiplication, Addition and Subtraction. This tells them that all the calculations below should be performed differently, in the order of the acronym BIDMAS.

$$4 + 3 \times 2$$

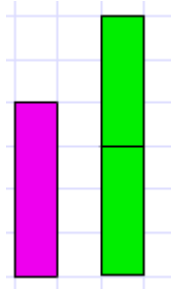
$$4 \times 3 + 2$$

$$(4 + 3) \times 2$$

$$4 \times (3 + 2)$$

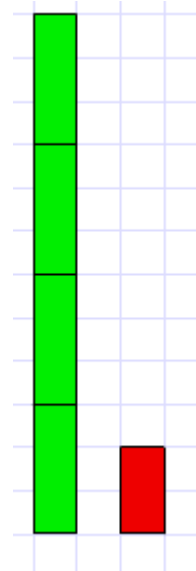
The calculations can be modelled as follows:

$$4 + 3 \times 2$$



$$= 10$$

$$4 \times 3 + 2$$



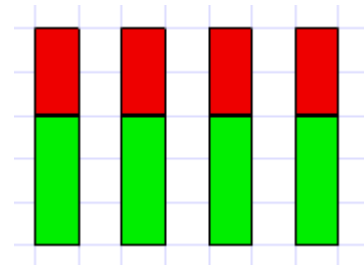
$$= 14$$

$$(4 + 3) \times 2$$



$$= 14$$

$$4 \times (3 + 2)$$



$$= 20$$

When addition and subtraction are present in the same calculation, they are performed in the order they appear in:

$$5 + 6 - 3 \text{ (do 5 add 6 first, then take away three)}$$

$$5 - 6 + 3 \text{ (do 5 take away 6 first, then add three)}$$

When division and multiplication are present in the same calculation, they are performed in the order they appear in.

$$4 \times 4 \div 2 \text{ (do 4 times 4 first, then divide by 2. Total is 8)}$$

$$4 \div 2 \times 2 \text{ (do 4 divided by 2 first, then multiply by 2. Total is 4)}$$

Children should practice examples like these and think about how they can visualise them. They will encounter the digit 2 or 3 as in index:

$$5^2 = 25 \quad (5 \times 5)$$

$$2^3 = 8 \quad (2 \times 2 \times 2)$$

Here is an example of a KS2 test paper question on BIDMAS:

Put **brackets** into this expression to make it correct.

$$10^2 \div 10 \div 10 \div 10 \div 10 = 100$$

When multiplying and dividing by 10, 100, 1000, children need to be encouraged to think about numbers sliding left and right through the place value columns:

Hundreds	Tens	Units	Tenths	Hundredths	Thousandths
	4	2	.		
		4	.	2	
			.		
			.		
			.		

Here is a model of $42 \div 10$. We describe it as follows:

"The forty (four tens) has slid one place to the left into the units column. The two units have slid one place to the left into the tenths column."

This is particularly important in this example:

$$35.3 \times 10$$

If we rely on the trick of "add a zero" this will produce the wrong answer.

A context here would be converting the price per litre on a petrol pump into pounds and pence for 10 litres.

Mental calculations continue to be important. This is an easy skill to practice.

Multiplication tables knowledge is essential. Children will need to have instant recall to 12×12 so that they can solve more complicated problems involving fractions and ratio. These are the parts of mathematics that children tend to find the most difficult, so please do spend time at home learning them.

The following websites are all good:

http://www.mad4maths.com/multiplication_table_math_games/

<http://www.interactivestuff.org/match/maker.phtml?id=5>

https://www.cgpbooks.co.uk/interactive_ks2_maths_sevenTimesTable

<http://www.arcademics.com/games/meteor/meteor.html>

<http://www.resourceroom.net/math/eightetal.htm>

<http://www.ictgames.com/spitfireufo.html>

<http://www.ictgames.com/multiBounce/>

<http://www.learnyourtables.co.uk/en/index2.htm>

For a small charge, the Squeebles app can be purchased for iPad or android tablets. This has been shown in school to be highly effective for learning tables.