

Progression of skills





At Portswood Primary Academy Trust, we strive for achievement for all our pupils and believe that all pupils should develop a passion for maths.

We want pupils to be *confident* in their use of maths; being able to *identify* where the *maths* is *in* the *problems* they are *faced* with, to prepare them for its use in the *real world* and to ensure that they are ready for the *next stage* of their *mathematics education*.

Our *aims* for maths, *reflect* the aims of the *National Curriculum*. Pupils should:

- •Become *fluent* in the fundamentals of Maths
- •Reason mathematically
- •Solve problems

Pupils, at Portswood Primary School, should have a *secure knowledge of mathematical facts* and be able to *recall* them *rapidly.* Ensuring that pupils *retain* a *knowledge* of number, other mathematical facts or the processes of calculation, will mean they are *not a barrier to use in wider mathematics.*

Maths teaching should be supported by using a *concrete, pictorial, abstract* approach.



This allows for *secure retention* of key mathematical concepts. *Manipulative resources* should be available until a pupil is confident working with abstract concepts. They may be returned to at any time.

Year 1



- group objects into twos, fives and tens
- use objects to solve one step multiplication problems
- use pictures to solve one step multiplication problems
- use arrays.

Additional support

To support our children we use **concrete apparatus by** using objects to make lots of. We focus on counting in 2s and 10s. Once confident, we then progress on to **pictorial representations** showing different 'lots of'.

Core methods

lots of

In Year 1 we begin with a **concrete** approach to addling 'lots of' in groups. We focus on counting in 2s, 5s and 10s. We then progress into physically making arrays with different objects before moving on to into a **pictorial** approach of drawing our own arrays.

Beyond expectations

To challenge our higher attaining children, we introduce them to the **pictorial approach** of drawing arrays earlier. We also provide arrays for them to read and write matching number sentences.

array

groups of multiply times

Year 1











Year 2



- solve multiplication sums for the 2, 5 and 10 times tables.
- solve multiplication problems using objects
- solve multiplication problems using arrays
- solve multiplication problems using repeated addition

Additional support

To support our lower attaining children we provide **concrete apparatus** of objects for children to physically create 'groups of'. Children are then provided **pictorial** scaffolded arrays (with context) for children to support their multiplication. We focus on lower multiples, such as 2s, 5s and 10s.

Core methods

In Year 2 we develop on **Year 1's concrete** arrays by using a **pictorial approach.** We pictorially draw the arrays to solve calculations. Follow the steps on the next page to see how we present our working out!

Beyond expectations

To challenge our higher attaining children we answer larger numbers as well as answering reasoning and word problems.

> arrays repeated groups equal groups of multiplication columns rows arrays altogether

Year 2





1. Write number sentence



2. Draw an array of equal columns and rows.



Count the array (/ cross off when counting)

6	X	4	11	2	4
9	g.	4	4		
.0	1	.#	×		
1	1	×	×		
A	4	y	q		
k	×	4	6		
4	1	6	6		

HELPFUL TIP:

When counting, we can count in our 2s, 5s and 10s (if confident) (/ cross off when counting)

















Year 3



- solve multiplication calculations for the 3, 4 and 8 times tables.
- write multiplication calculations, including two digit numbers x one - digit numbers (e.g. 26 x 4).
- begin to use formal written methods for multiplication calculations.
- solve a range of multiplication problems

Additional support

To support our children we use concrete apparatus counters and number lines. We focus on repeated addition on a number line and focus on counting in 2s, 5s and 10s. We also use Year 2's pictorial approach of arrays to support depending on confidence and attainment.

Core methods

In Year 3 we introduce an **abstract** method of expanded column. We use our prior knowledge of partitioning and then expand our working out to support our method. Follow the steps on the next page to see how we present our working out.

Beyond expectations

To challenge our higher attaining children we introduce 3 digit x 1 digit (e.g. 131 x 5) and then progress further onto Year 4's abstract method of compact multiplication.





lots of sets of

tens ones hundreds times multiply double (x2)





1. Write number sentence



2. Write your expanded column method.



partition your numbers into tens and ones

3. Wite your related multiplications in the columns below.



4. Work out your multiplications and record answers.





when recording our multiplications we partition our numbers into tens and ones

5. Add your multiplications together using your column addition method and record your answer.





 $Y_{ear} 3$













- solve multiplication calculations for all the times tables up to 12 x12.
- multiply together 3 numbers ٠
- use formal written methods to multiply two digit numbers by one ٠ - digit (64 x 4)
- use formal written methods to multiply three digit numbers by one - digit (164 x4)

Additional support

To support our children we provide concrete apparatus with place value counters, times table squares and presentation scaffolds. We then progress onto expanded column method with a focus of multiples 2,3,4 or 5.

Core methods

In Year 4 we continue teaching children the **abstract method** of expanded column method with a focus on larger numbers (HTO x O). As the Year progresses and depending on confidence and attainment, we introduce compact column method. Follow the steps on the next page to see how we present our working out!

Beyond expectations

To challenge our higher attaining children, we start by learning the abstract method compact column. We will focus on larger sums (ThHTO x O) as well as applying these skills with reasoning and word problems.



multiply times groups of multiple tens ones hundreds thousands





1. Write number sentence



2. Write your compact column method.



3. Calculate your ones column (e.g. 4 x 6)



4. Calculate your tens column (e.g. 4 x 30)



If struggling, multiply ones and remember to hold the place value. E.G ($6 \times 3 = 18$ add the place value - 180.

5. Add your multiplications together using your column addition method.

3 6 4 X 2 4 0 1 4 4

















- multiply numbers up to 4 digits by 1 digit using a formal written method
- multiply numbers up to 4 digits by 2 digits using a formal written method
- use long multiplication for 2 digit numbers
- multiply whole numbers and decimals by 10/ 100/ 1000
- solve multiplication problems using mathematical knowledge, including factors, multiples, squared and cubed

Additional support

To support our children we use **concrete apparatus** of dienes to support children with their compact column method. By using dienes, we can support children with their exchanging.

Core methods

In Year 5 we continue the end of Year 4's **abstract compact column method** with a focus on larger numbers. We also introduce HTO x TO. Follow the steps on the next page to see how we present our working out!

Beyond expectations

To challenge our higher attaining children we focus on larger calculations, such as ThHTO x HTO. We also apply our methods to solve reasoning and problem solving.

exchange multiply times product place holder multiply





1. Write number sentence in compact column method



Make sure we put our numbers in the right columns

2. Multiply the ones column







(Exchange tens over into the next place value holder if needed)

3. Multiply the tens column









Start with a place value holder

<mark>(2</mark>)	X (6)
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6

Add together the multiplied numbers using compact addition.

(Exchange hundreds over into the next place value holder if needed)

We also use this method in Year 6!











Yearb



By the end of the year I can...

- multiply up to 4 digit numbers by a 2 digit whole number using long multiplication
- multiply up to two decimal places
- identify common multiples
- identify common factors
- identify prime factors
- use BODMAS (can also be referred to as BIDMAS) to solve calculations
- use estimation to check answers to calculations and accuracy

Additional support To support our children we use concrete apparatus or place

To support our children we use **concrete apparatus** or place value counters. By using place value counters, we can support children with their exchanging (if needed). We also encourage children to then use a **pictorial** approach by drawing arrays to calculate times tables.

Core methods

In Year 6 we continue the end of Year 5's **abstract compact column method** with a focus on larger numbers. We also introduce multiplying decimals. Follow the steps on the next page to see how we present our working out!

Beyond expectations

To challenge our higher attaining pupils we introduce multiplying decimals up to 2 decimal places as well as identifying common multiples and common factors.



multiples factors prime numbers prime factors BODMAS estimation decimal places groups of lots of inverse





- multiplying decimals

1. Write number sentence



2. Mark the decimal places



3. Calculate the multiplication using compact multiplcation



4. Add the marked decimal places to the answer







Portswood

Primary School



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Luca and Oliver surprise Mr Howie by decorating his house overnight without permission.

Flags cost £8.47 for 3 flags. Bunting costs £6.75 per 50cm. Window stencils cost £3.45 each.

They buy 15 flags, 8.5m of bunting and 13 window stencils. How much does this cost?

