

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.


$$
2+1=3
$$

ABSTRACT
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

## By the end of the year I can...

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


## Additional support

To support our children we use concrete apparatus by moving objects into sharing circles. We focus on sharing equally between 2.
Core methods

In Year 1 we begin with a concrete approach of dividing objects into sharing circles. We focus on sharing in $2 \mathrm{~s}, 5 \mathrm{~s}$ and 10 s . We then progress into a pictorial approach of drawing our own arrays.

Beyond expectations
To challenge our higher attaining children, we move onto drawing our own sharing circles with a focus on larger numbers.

$$
\text { Year } 1
$$

Children's work



By the end of the year I can...

- solve division sums for the 2,5 and 10 times tables.
- solve division problems using objects
- solve division problems using sharing circles
- solve multiplication problems using mental methods

Additional support
To support our children we use concrete apparatus with sharing objects. We then use scaffolded number sentences that provide pictorial sharing circles.
Core methods
In Year 2 we develop on Year 1's method of pictorial sharing circles. We provide number sentences for children to draw sharing circles to equally share. 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.

Steps

1. Write number sentence

2. Draw your sharing circles

3. Equally share your total into the sharing circles

4. Count the ones shared in one sharing circle
(/ cross off when counting)


Year 2
Children's work
$6 \div 2=3 r \quad 10-5=21$
00000000
$8-4=2 v \quad 15-5=31$
000000000
$8=2=4 v \quad q-3=3 v$
$100 \quad 0 \quad 00$
$12-4=3 v \quad 18-6=3 v$
000000000

| $21 \div 3=7 \mathrm{r}$ |
| :---: |
| 000 |
| $16-4=4 r$ |
| 0000 |

## Year

## By the end of the year I can...

- solve division calculations for the 3,4 and 8 times tables.
- write division calculations, including two - digit numbers $\div$ one digit numbers
- use mental maths to solve division calculations
- to use formal written methods for division calculations.

Additional support
To support our lower attaining children we use concrete apparatus with using objects to move objects into sharing circles. We then progress onto pictorial sharing circles and using place value counters.
Core methods
In Year 3 we progress into abstract methods. We first introduce the place value table to divide numbers and then progress onto exchanging numbers.

## Beyond expectations

To challenge our higher attaining children we solve 3 digit $\div 1$ digit questions. We also have a focus on extended range of times tables, such as our 6, 7 and 9 times tables.

# Year 3 

1. Write number sentence

$$
84 \div 4=
$$

2. Draw place value table including the tens and ones column
(The divisor tell you the number of rows to draw)

| $84 \div 4=$ |
| :--- |
| Tens |
|  |
|  |

3. Draw the number of tens and ones underneath the place value grid

4. Share the tens equally in each row in the tens column.
(Crossing the tens off as you go)

5. Repeat with ones

| Tens | Ones |
| :--- | :--- |
| 10$)(10)$ | 0 |
| (0) (0) | 0 |
| 10$)$ | $(10)$ |
| 10$)$ | 0 |

7. Find the total of each row (Check they are all equal)

| Tens | Ones |  |
| :--- | :--- | :--- |
| (10) (10) | 0 | $=21$ |
| (10) (1) | 0 | $=21$ |
| (10) (10) | 0 | $=21$ |
| (10) (10) | (1) | $=21$ |

Steps

1. This method works well with certain number sentences.

Here are some examples:

$$
\begin{aligned}
& 44 \div 4= \\
& 44 \div 2= \\
& 63 \div 3= \\
& 84 \div 2= \\
& 86 \div 3= \\
& 55 \div 5= \\
& 66 \div 3= \\
& 28 \div 2= \\
& 26 \div 2= \\
& 22 \div 2= \\
& 24 \div 2= \\
& 42 \div 2= \\
& 88 \div 4= \\
& 48 \div 4= \\
& 99 \div 3= \\
& 84 \div 4=
\end{aligned}
$$

# Year 3 

1. Write number sentence

2. Draw place value table including the tens and ones column
(The divisor tell you the number of rows to draw)

| Tens | Ones |
| :--- | :--- |
|  |  |
|  |  |

3. Draw the number of tens and ones underneath the place value grid

4. Share the tens equally in each row in the tens column.
(Crossing the tens off as you go)

| Tens | Ones |
| :--- | :--- |
| (1) (1) |  |
| (2) |  |
| O18 (1) (10) |  |

5. Make sure the tens are shared equally and if there are extras leave them underneath.
6. Exchange the extra tens for ones using the 'Swap Shop Wiggle'
(we used this in Year 2)


はOOOOOOOOO
8. Share all the ones and find the total of each row
(don't forget to share the original ones)
(Crossing the ones off as you go)


Year 3
Children's work


## Year 4

## By the end of the year I can...

- solve division calculations for all the times tables up to 12 $\times 12$.
- use place value to divide mentally
- use division facts to solve mental calculations
- use formal written methods including short division

Additional support
To support our lower attaining children we provide concrete apparatus of counters to share with. We then progress onto pictorial sharing circles and repeated subtraction on a number line.

## Core methods

In Year 4 we use abstract methods of vertical chunking which progresses into short division. Follow the steps on the next page to see how we present our working out!

## Beyond expectations

To challenge our higher attaining children we apply short division with word problems and problem solving.

# Year 4 

Vertical chunking

1. Write number sentence and write in "bus stop" method

2. Use known multiplication facts to work out the sum
(start with larger calculations, such as 10x or $12 \times$ where possible)


Record your
multiplication next to the bus stop.
3. Take away your multiplication from your given number
$4 \sqrt{52}$
$\frac{40(1}{12}$
4. Use a known multiplication fact to take away from the remaining number
(if the number is larger, repeat using larger calculations to make the total smaller0
$4 \sqrt{52}$
$\frac{40}{12}(10 \times 4)$
$12(3 \times 4)$
5. Take away your multiplication and add the multiplications you have used to work out the answer


Circle your added
multiplications
when adding up

Bus stop

1. Write number sentence and write in "bus stop" method

2. See how many groups of your division you can get from your largest place value
(e.g. how many 3 s are in $3-$ as 30 is the largest place value)


Record your number above in the bus stop.
3. See how many groups of your division you can get from your next place value
(e.g. how many 3 s are in 9 - as 9 is the next place value)


Year 4
Children's work


## Year 5

## By the end of the year I can...

- divide numbers up to 4 digits by 1 digit using a formal written method of short division
- understand and use remainders
- divide whole numbers and decimals by $10 / 100 / 1000$
- solve division problems using mathematical knowledge, including factors, multiples, squared and cubed
Additional support
To support our lower attaining children, we progress on Year 4's 'bus stop' method with concrete apparatus of Numicon.


## Core methods

In Year 5 we continue the end of Year 4's abstract short division (bus stop) with a focus on larger numbers. We introduce dividing 4 digits $\div 1$ digit.

Beyond expectations
To challenge our higher attaining children we focus on questions that introduce remainders as decimals and fractions.


Steps

1. Write number sentence in "bus stop' method.

2. See how many groups of your divisor you can get from your largest place value
(e.g. how many 6 s are in 1 - as 1000 is the largest place value)


If your number can not go into the place value, exchange over to the next column. E.g. 6 does not go into 1, cross out and exchange to the next value (2 becomes 12)
3. See how many groups of your divisor you can get from your next place value
(e.g. how many Gs are in 12-as 1,200 is the next place value)

4. Repeat this method until you have completed the calculation


Children's work

1) $633 \div 3=211 \mathrm{w}$

$$
\frac{211}{3 \sqrt{63} 3}
$$

(2) $848 \div 4=2124$

$$
4812
$$

$$
\begin{gathered}
3) 5=5 \div 5=101 \\
\frac{101}{5 \sqrt{5} 05} \sqrt{ }
\end{gathered}
$$

$$
\text { 4) } 8267 \div 2=41324
$$

$$
\begin{array}{r}
4132 \\
218264
\end{array}
$$

## Yearl

## By the end of the year I can...

- divide numbers up to 4 digits by a 2 digit whole number using long division
- understand and use remainders as whole numbers, fractions and by rounding
- 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 lower children we use concrete apparatus such as Numicon. We also introduce bar modelling.

Core methods
In Year 6 we progress from Year 5's abstract 'short division' into chunking of larger numbers. Similar to Year 3's method but with a focus on larger numbers, such as 4 digits divided by 2 digits. We also focus on converting remainders from fractions to decimals.
Beyond expectations
To challenge our higher attaining children, we introduce the 'drop down method' to progress from chunking. We also encourage estimating answers before calculating.


Steps

1. Write number sentence in chunking 'bus stop'

$$
3066 \div 73=
$$

$$
7 3 \longdiv { 3 0 6 6 }
$$

2. Write down related multiplication facts to support.
(related multiplication facts to help -xi, x10, x100 -doubles)


$$
\begin{array}{r}
73 \times 1=73 \\
\times 2=146 \\
\times 4=292 \\
\times 10=730 \\
\times 100=7300 \\
\times 50=3650
\end{array}
$$

Use your related multiplication facts to take away.

Repeat until you have nothing left

Children's work
A)

B)

c) $\left.\begin{array}{l}1483 \\ \frac{842}{042}(14 \times 60) \\ \frac{42(14 \times 3)}{0}\end{array}\right)$.

$$
\begin{aligned}
& 60 \times 1=60 \\
& 60 \times 2=120 \\
& 60 \times 3=180 \\
& 60 \times 4=240 \\
& 60 \times 10=600 \\
& 60 \times 5=300
\end{aligned}
$$

$$
\begin{aligned}
& 96 \times 1=196 \\
& 98 \times 2=392 \\
& 96 \times 3=588 \\
& 96 \times 4=784
\end{aligned}
$$

落

$$
\begin{aligned}
& 14 \times 1=14 \\
& 4 \times 2=28 \\
& 4 \times 3=42 \\
& 4 \times 4=56 \\
& 14 \times 10=140 \\
& 14 \times 5=70 \\
& 14 \times 40=560 \\
& 14 \times 60=840
\end{aligned}
$$

