

# 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.

## Early years

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

- I can subtract numbers up to 10 using objects
- I can count back to find an answer


## Additional support

To support our children we learn the concept of number first (up to 5). We then develop accurate touch counting which progresses into counting concrete objects. This will be repeated to develop confidence. If confident, they would progress into taking one less from concrete apparatus.

## Core methods

In Early Years we start our subtraction by answering words problems in context altogether. We present this using five frames. When we develop confidence we progress onto tens frames with a pictorial representation. We then use concrete apparatus to independently take objects away which will then progress into pictorial 5 s and 10 s frames.


Beyond expectations
To challenge our children we learn pictorial representations of jottings to take away.


## Early years

 O. Protswood Children's work
one less



## Year 1

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

- use my numbers bonds to 20 to help me with subtraction
- subtract one - digit and two - digit numbers from 20
- solve one step problems using subtraction
- use objects and pictures to help me solve my number problem - solve missing number problems up to 20


## Additional support

To support our children we subtract using concrete apparatus by removing objects. We then progress into moving counters from a tens frame. If confident, we progress into pictorial by crossing out pictures and counting the remaining. We will focus on numbers 1-20.
Core methods
In Year 1 we start with a concrete apparatus of a tens frame where children can physically remove counters to support their subtraction. Once confident, we will progress to subtracting on a number line, "jumping" in 1's on a structured number line.

Beyond expectations
To challenge our children we will provide them with a blank number line for them to subtract from a given number.

## Year 1 OP Portswood

## Children's work



$$
3-2=1<\left.\left.\right|_{0}\right|_{2} ^{1} \quad 1>
$$

$$
20-11=0
$$

## Year

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

- begin to use number facts, when subtracting, up to 100
- subtract a two-digit number and ones (13-3 $=10$ )
- subtract a two -digit number and tens $(21-10=11)$
- subtract a two two - digit numbers (56-34=22)
- subtract three one - digit numbers (9-5-1 =3)

Additional support
To support our children we start with concrete apparatus taking away dienes, counters or objects. Once confident, we introduce a pictorial method; partitioning our numbers and crossing out what we are taking away. We focus on subtractions that do not require exchanging.
Core methods
In Year 2 we partition numbers and use tens and ones to work out answers. We use pictorial methods with subtraction by drawing tens and ones. Follow the steps on the next page to see how we present our working out!
Beyond expectations

To challenge our higher attaining children we subtract numbers over 100 as well as introducing complex problem solving, such as 2-step problems and using known facts.

$$
\begin{array}{r}
\text { subtract take away less than minus } \\
\text { exchange tens ones partition } \\
\text { swap shop count } \\
\hline
\end{array}
$$

## Year 2

Steps

1. Write the number sentence

2. Partition the largest number into tens and ones (hundreds if needed)

3. Take away ones -
( X cross off when taking away)
$43-2$
$|1| 1: x$
4. Take away tens
( X cross off when taking away)

5. Count the remaining
(/ cross off when counting)
$43-21$
$++* *=x$

## Year 2

Steps .exranging

1. Write the number sentence

2. Partition the largest number into tens and ones (hundreds if needed)

3. Take away ones -
(here we can not take away 4-9 so we visit the swap shop, which means we exchange 1 ten for ten ones)



Swap Shop Wiggle for the exchanged ten
ten exchanged ones
4. Take away tens and ones- (take away ones first) (X cross off when taking away)

| $34-19=$ |
| :--- |
| $1 \times 5 \cdot \cdot$ |

5. Count the remaining
(/ cross off when counting - count the tens first and then the ones)


Year 2
Children's work
$26-22=4$
*れ行
$22-14=8$
k 8.
$35=17=18$
t*\$
$\square$
***\$:

$$
\begin{aligned}
& 50-10=40^{1} \\
& t+t+t
\end{aligned}
$$



Portswood

By the end of the year I can...

- subtract numbers with up to three - digit
- partition numbers with up to three - digits
- use the column method to subtract with three digit numbers
- use inverse operations to check answers

Additional support
To support our children we use concrete apparatus such as place value counters, dienes and use our number bonds up to 10/20. We then progress onto Year 2's pictorial method of partitioning tens and ones to support our subtraction.
Core methods
In Year 3 we learn an abstract method of expanded column. This develops on Year 2's pictorial method as we equally partition the numbers but progress into a written method. Follow the steps on the next page to see how we present our working out!
Beyond expectations
To challenge our children we introduce larger calculations, such as hundreds take way hundreds (e.g. $224-153$ ) that also require exchanging the tens. We also introduce the Year 4 compact column method as well as reasoning problems.


# Year 3 

## Steps

1. Write number sentence
$123-102=$
2. Write your expanded column method with your partitioned numbers

| 1 | 0 | 0 | 2 | 0 | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 0 | 0 |  | 0 | 2 |

3. Take away ones column

| 1 | 0 | 0 | 2 | 0 | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 0 | 0 |  | 0 | 2 |
|  |  |  |  |  |  |

4. Take away tens column

| 1 | 0 | 0 | 2 | 0 | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 0 | 0 |  | 0 | 2 |
|  |  |  | 2 | 0 | 1 |

5. Take away hundreds column

| 1 | 0 | 0 | 2 | 0 | 3 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 0 | 0 |  | 0 | 2 |
|  | 0 | 2 | 0 | 1 |  |

6. Add your partitioned numbers to work out your total
$\square$

# Year 3 

Steps. exthonging

1. Write number sentence
$178-94=$
2. Write your expanded column method with your partitioned numbers

| 100 | 70 | 8 |  |
| ---: | ---: | ---: | ---: |
|  |  | 90 | 4 |

3. Take away ones colurnn

| 1 | 0 | 0 | 7 | 0 |
| :--- | :--- | :--- | :--- | :--- |
|  |  | 9 | 0 | 4 |
|  |  |  |  |  |

4. Take away tens column

| $\boldsymbol{1} \boldsymbol{\sigma}$ | 1 | 7 | 0 |
| :--- | :--- | :--- | :--- |
|  | 9 | 0 | 4 |
|  | 8 | 0 | 4 |
|  |  |  |  |

When unable to take away (such as $70-90$ ) we exchange from the next column/ place value


If unable to take away ( $170-90$ ), simplify the place value (17-9).
5. Take away hundreds column (if possible)

| 100 | 1 | 7 | 0 | 8 |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | 9 | 0 | 4 |
|  |  | 8 | 0 | 4 |

6. Add your partitioned numbers to work out your total
$80+4=84$

Children's work

|  | 1 | $85-16$ | 6 | $6+21$ |
| :---: | :---: | :---: | :---: | :---: |
| $H$ |  | $T$ | 0 |  |
| 1 | 0 | 0 | 80 | 5 |
| -1 | 0 | 60 | $\frac{4}{1}$ |  |
| 0 | 20 | 1 |  |  |

$$
664-243=421 V
$$



$$
\begin{array}{ccccc}
1 & 6 & 8 & =2 & 9=1 \\
H & T & 0 \\
1 & 0 & 0 & 85 & 0 \\
18 \\
1 & -2 & 0 & 9 \\
1 & 0 & 0+3 & 0+9
\end{array}
$$

## Year 4

By the end of the year I can...

- subtract numbers with up to 4 digits
- use methods of column subtraction
- use inverse operations to check calculations
- solve problems with two steps.


## Additional support

To support our children we use concrete apparatus of dienes or place value counters to aid subtracting. We then progress onto a scaffold layout with a pictorial approach of using number lines and hundred squares. We also focus on numbers that do not require exchanging.

## Core methods

In Year 4 we use an abstract approach of compact column method. This develops from Year 3's expanded column. We focus on larger numbers (up to thousands). 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 larger numbers (up to tens thousands) as well as introducing reasoning and problem solving.

## Year 4 teps

1. Write number sentence
$327-194$
2. Set your number sentence into compact column method

(thousands if needed)
3. Take away ones column (exchange into next place value if needed))

4. Take away tens column
(exchange into next place value if needed))


Exchange from the next place value if unable to take away.
5. Add hundreds column and record your answer.


We also use this method in Year 5 and 6!

Year 4
Children's work


## Year 5

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

- subtract whole numbers with more than 4 digits
- use methods of column subtraction
- subtract numbers mentally with more than 4 digits - use rounding to check calculations and accuracy - solve multi - step problems.

Additional support
To support our children we introduce concrete apparatus to aid subtracting. We use dienes or counters before progressing into a pictorial approach previously seen in Year 2.

Core methods
In Year 5 we continue teaching our children compact column method (as previously taught in Year 4). We focus on subtracting 4 or more digit numbers. Follow the steps on the next page to see how we present our working out!
Beyond expectations
To challenge our higher attaining children we subtract increasingly larger numbers and decimals. We also introduce reasoning and problem solving.


## Year 5

Primary School

1. Write number sentence

2. Set your number sentence into compact column method

3. Take away ones colurnn (exchange into next place value column if needed)

4. Take away tens column
(exchange into next place value column if needed)

5. Take away hundreds column
(exchange into next place value column if needed))


Exchange from the next place value if unable to take away.
6. Take away thousands column and record your answer


Year 5
Children's work

$$
\begin{aligned}
& \begin{array}{r}
1815^{2} 7 \\
-\quad 889 \\
\hline 1148
\end{array} \\
& \text { संश } 346 \\
& -8946
\end{aligned}
$$

## Yearlo

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

- use mental calculations using mixed operations
- use my knowledge of the order of operations to carry out calculations (BODMAS - sometimes referred as BIDMAS)
- solve multi - step problems using formal methods
- use estimation to check answers to calculations and accuracy
- use mental calculations to solve problems using known facts e.g. $7-3=4$ so 700 $-300=4000$
- use formal written methods to calculate addition up to 10 million

Additional support
To support our children we use concrete apparatus with dienes to support exchanging. We also focus on smaller numbers and which will become greater with developed confidence and attainment.
Core methods
In Year 6 we continue using compact column method with a focus on larger numbers, as well as subtracting decimals. Follow the steps on the next page to see how we present our working out!
Beyond expectations

To challenge our high attaining children we subtract larger numbers, as well as subtracting whole numbers and decimals (e.g. 4-3.261). We also introduce reasoning and problem solving.
less than decrease by difference between exchange BODMAS inverse subtract minus


Steps

1. Write number sentence

$$
6324-4921
$$

2. Set your number sentence into compact column method

(start with the smallest column e.g ones)
3. Take away ones column
4. Take away tens column (exchange into next place value if needed) (exchange into next place value if needed)

| 6324 |
| ---: |
| -4921 |


5. Take away hundreds column
(exchange into next place value if needed))
6. Take away thousands column and record your answer

(this time the smallest column is the hundredths)
Subtracting decimals
We use the same method for subtracting decimals. We must make sure that we put our numbers in the correct columns and include the decimal place.

| 4 | $7_{3}^{1}$ | 7 | 7 | 1 | 1 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4 | 2 | 6 | 4 | 2 | 3 |
| 4 | 0 | 6 | 3. | 9 | 1 |

Yearlo
Children's work


