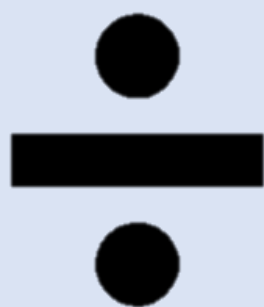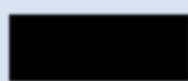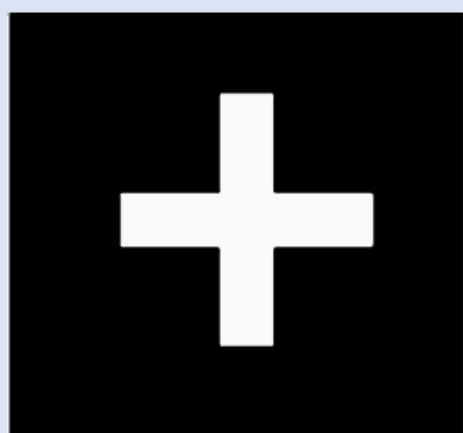# Portswood
## Primary School

# Progression of skills

+ -

× ÷

# addition

**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.

# Early years

**By the end of the year I can…**

- I can add numbers up to 10 using objects

- I can count on to find an answer

## Additional support

To support children in Early years we do the following:

- Accurate touch counting.
- Accurate counting in order.
- Cardinal number.
- Concrete apparatus.
- Repetition.

## Core methods

In Early years we teach our addition with **story based context and real life context**. This is supported with visual images. We then progress onto **concrete** addition, such as using counters on a tens frame. Later on we introduce the numeral representation and symbol (+).
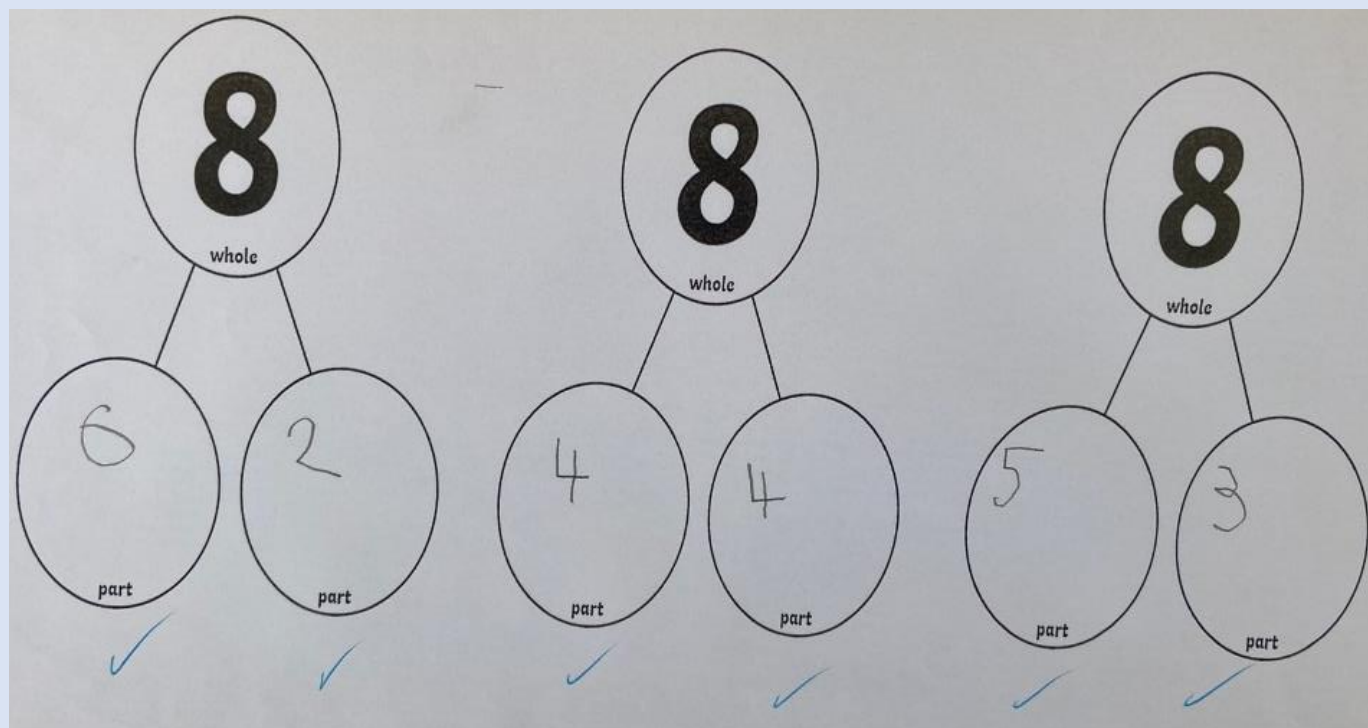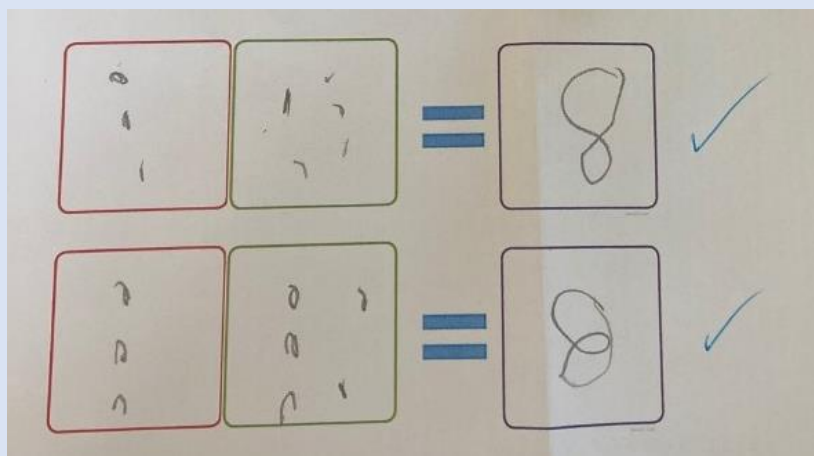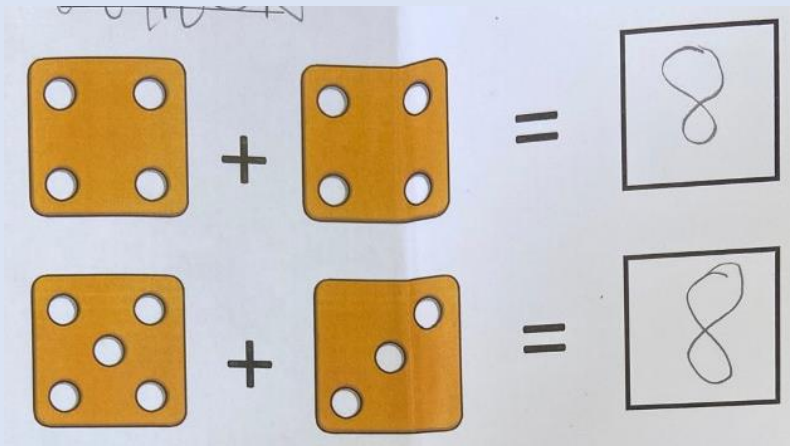
## Beyond expectations

To challenge our children they complete number sentences without concrete apparatus. They will use their fingers or own pictorial representations to support. We further challenge with the introduction of adding on a number line.

More     Altogether     Added     Plus     Equals
Number sentence     Numerals     How many

# Early years
# Children's work

# Year 1

**By the end of the year I can…**

- I know my number bonds to 20
- add one – digit and two - digit numbers to 20
- solve one step problems using addition
- solve missing number problems up to 20

# Additional support

To support children in Year 1 we use **concrete apparatus** with a focus on numbers from **1-20.** We get children to move objects to support their addition. We then progress onto concrete tens frame. Once confident, we progress onto **pictorial** support with children counting pictures to add together.

# Core methods

In Year 1 we start with a **concrete apparatus** of tens frames with children physically moving counters. We then progress on to counters and numicon before introducing addition on a number line. First, we provide a concrete number line so that children can use their fingers to add on. We then progress onto **pictorial** with writing on a given structured number line, before finally being able to independently draw and write our own to support our addition with a focus of numbers from **1-40**.

# Beyond expectations

To challenge our children we provide blank number lines, as well as using numbers **up to 100.** We can further challenge our higher attaining children by adding in 2s and 10s.
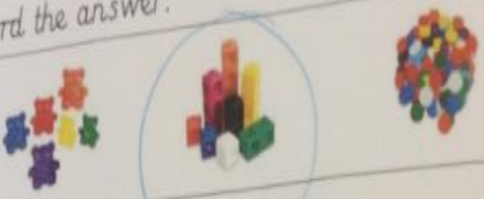
add     together     altogether   more    equal

# Year 1

## Children's work

I can record the answer.
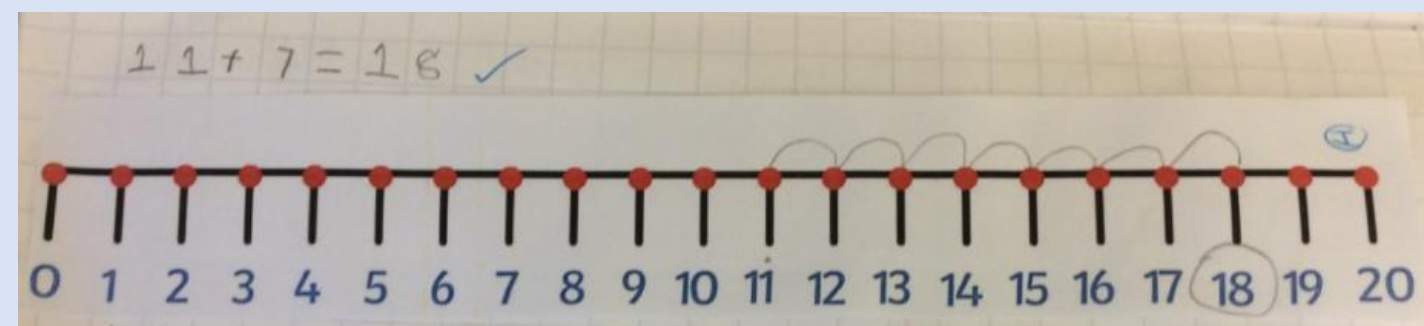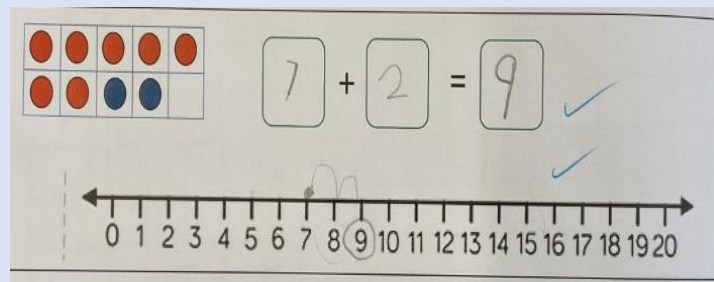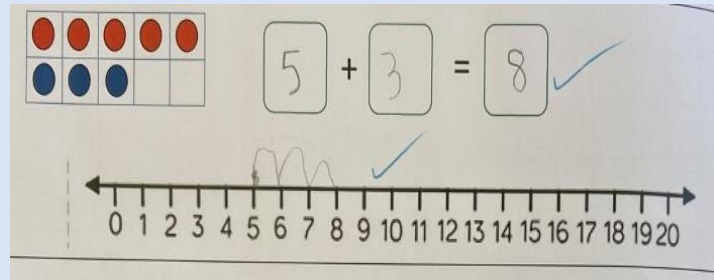
I used:

15 + 4 = 19 ✓

8 + 5 = 13 ✓

5 + 3 = 8 ✓

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

7 + 2 = 9 ✓

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

11 + 7 = 18 ✓

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

15 + 4 = 19 ✓

15 16 17 18 19   1 7   1 8 1 9

12 + 7 = 19

12 13 14 15 16 17 18 19

# Year 2
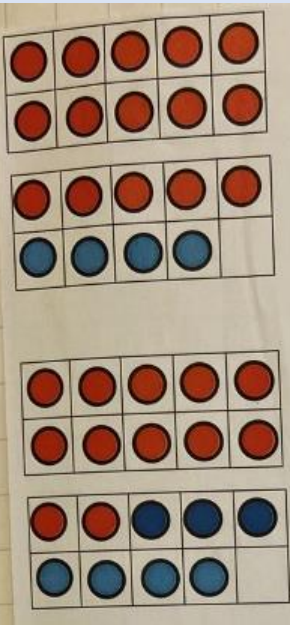
**By the end of the year I can…**

- remember my addition number facts to 20

- begin to use number facts, when adding, up to 100

- add a two-digit number and ones *(13 + 3 = 16)*

- add a two –digit number and tens *(21 + 30 = 51)*

- add two two - digit numbers (65 + 34 = 99)

- add three one – digit numbers (5+8+9 = 22)

## Additional support

To support children in Year 2 we add numbers that are below 20 without exchanging. We also use **concrete** support such as dienes, objects and scaffold layouts.
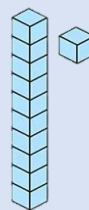
## Core methods

In Year 2 we partition numbers and use tens and ones to work out answers. We use a **pictorial** method; drawing tens and ones. We work with numbers up to 100. Follow the steps on the next page to see how we present our working out!

## Beyond expectations

To challenge our higher attaining children we add numbers above 100 as well as including more complex problems, such as 2 step problems.

partition add       tens & ones 'i know so i know'
total       more       altogether       exchange

# Year 2

## Steps

1. Write number sentence

$$2\;6 + 3\;5 =$$

2. Partition both numbers into tens and ones *(hundreds if needed)*

3. Count tens — *(e.g. 10,20,30,40,50)*
   (/ cross off when counting)

4. Count ones — *(e.g 51,52,53,54,55,56,57,58,59,60,61)*
   (/ cross off when counting)

5. Write the total amount
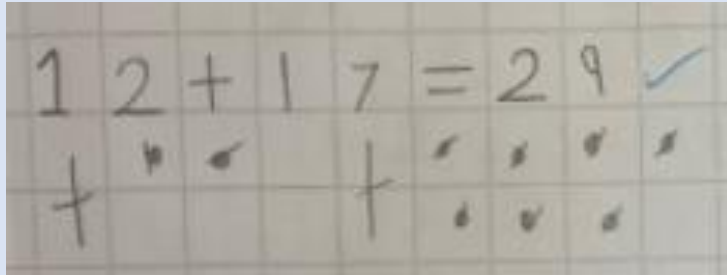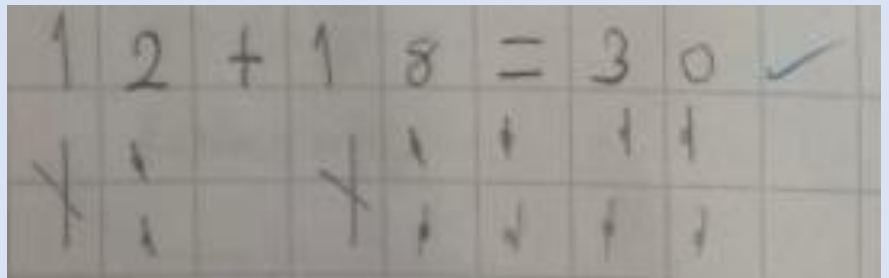
$$2\;6 + 3\;5 = 6\;1$$
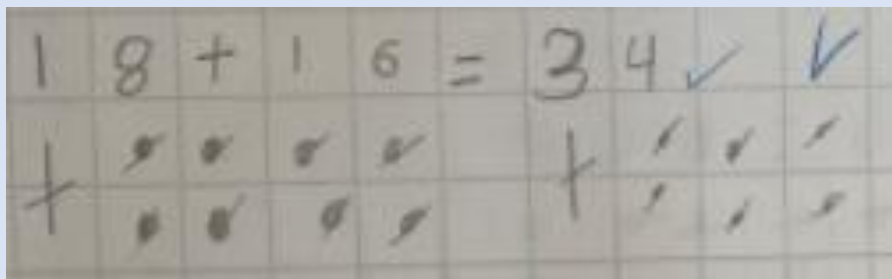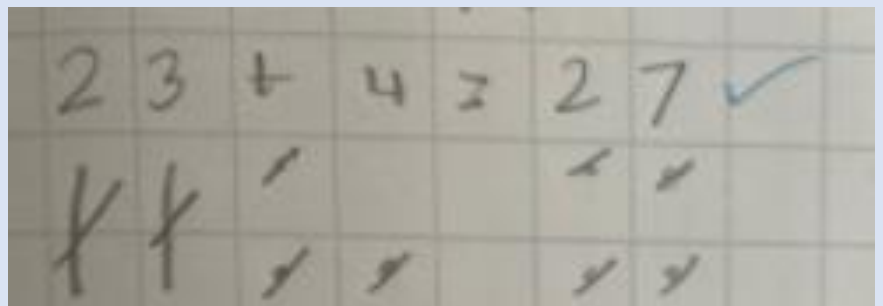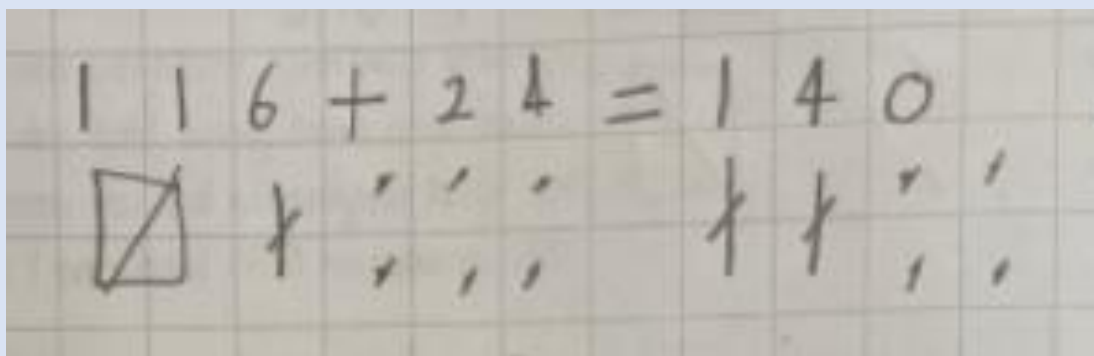
# Year 2
## Children's work



$12 + 17 = 29$ ✓



$12 + 18 = 30$ ✓



$18 + 16 = 34$ ✓ ✓



$23 + 4 = 27$ ✓



$116 + 24 = 140$

# Year 3

Portswood Primary School

**By the end of the year I can…**

- add mentally a three digit number and ones *(106 + 8 = 114)*
- add mentally a three –digit number and tens (*121 + 30 = 151)*
- add mentally a three – digit number and hundreds (*165 + 349 = 514)*
- add numbers with up to three - digits
- use the column method to add with three-digit numbers

## Additional support

To support our children we use **concrete apparatus** such as dienes and counters as well as focusing our learning on our number bonds to 10/20. We then progress onto **Year 2's pictorial method** of partitioning tens and ones.

## Core methods

In Year 3 we teach children 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. To challenge our children we introduce adding 3 digit numbers (e.g. 142 + 231) as well as introducing exchanging 10's.

## Beyond expectations

To challenge our children we introduce **compact column method** *(a Year 4 method)* as well as exchanging more than once in a calculation.

partition recombine tens & ones & hundreds
column       add       plus        more than
           increase   exchange

# Year 3 Steps

1. **Write number sentence**

   $$2\ 6\ +\ 4\ 8\ =$$

2. **Partition your numbers into tens and ones** *(hundreds if needed)*

   $$2\ 6\ +\ 4\ 8\ =$$
   20   6   40   8

3. **Write your expanded column method with your partitioned numbers**

   | T | O |
   |---|---|
   | 2 0 | 6 |
   | + 4 0 | 8 |
   | | |

4. **Add ones column**
   *(exchange into next place value if needed))*

   | T | O |
   |---|---|
   | 2 0 | 6 |
   | + 4 0 | 8 |
   | | 4 |
   | 1 0 | |

   When exchanging you must remember to record your 10

5. **Add tens column**
   *(exchange into next place value if needed))*

   | T | O |
   |---|---|
   | 2 0 | 6 |
   | + 4 0 | 8 |
   | 7 0 | 4 |
   | 1 0 | |

   Remember to add your exchanged place value

5. **Add your partitioned numbers to work out your total**

   | T | O |
   |---|---|
   | 2 0 | 6 |
   | + 4 0 | 8 |
   | 7 0 + 4 = 7 4 | |
   | 1 0 | |

# Year 3
# Children's work

117 + 28 = 145 ✓
```
100        10   7
           20   8
100        40   5
            10
```

237 + 25 = 262 ✓
```
H           T        0
200        30       7
           20       5
200  +  60  +  2 2 2 6 2
            10
318 + 739 = 457 ✓
```

37 + 25 = 62 ✓
```
30     7
20     5
60     2
 1 0
```

268 + 24 = 292 ✓
```
200    60   8
       20   4
200    90   2
        10
```

## Addition Word Problems

1. There are **143** books in one classroom and **47** books in another classroom. What is the total number of books in both classrooms?

143 + 47 = 190 books ✓✓

```
H          T        0
100       40       3
          40       7
100  +  90  +  0 = 190 books
           10
```

# Year 4

**By the end of the year I can…**

- add numbers with up to 4 digits

- use methods of column addition

- estimate to check my answer

- solve problems with two steps.

- explain the method I used and why

## Additional support

To support our children we use **concrete apparatus** with dienes, counters and place value counters. We then progress onto **pictorial** and use the expanded column method previously taught in Year 3 but adding numbers that require no exchanging.

## Core methods

In Year 4 we teach children an **abstract method** of compact column addition. This develops on Year 3's expanded column method. We focus on numbers from **thousands** depending on confidence and attainment**.** Follow the steps on the next page to see how we present our working out!

## Beyond expectations

To challenge our children we use larger numbers with a focus on exchanging. We also complete reasoning challenges.

add     addition altogether   re-group
exchange     total     ones & tens & hundreds
& thousands

# Year 4 Steps

1. **Write number sentence**

   $267 + 184 =$

2. **Set your number sentence into compact column method**
   *(thousands if needed)*

   ```
   H T O
   2 6 7
   + 1 8 4
   ```

3. **Add ones column**
   *(exchange into next place value if needed))*

   ```
   H T O
   2 6 7
   + 1 8 4
         1
       1
   ```

   When exchanging you must remember to record your 10

4. **Add tens column**
   *(exchange into next place value if needed))*

   ```
   H T O
   2 6 7
   + 1 8 4
       5 1
     1 1
   ```

   Remember to add your exchanged place value

5. **Add hundreds column**

   ```
   H T O
   2 6 7
   + 1 8 4
   4 5 1
     1 1
   ```

6. **Record your answer**

   $267 + 184 = 451$

   We also use this method in Year 5 and 6!

# Year 4
## Children's work

| + | Th | H | T | O |
|---|----|---|---|---|
|   | 2  | 3 | 8 | 9 |
|   | 1  | 5 | 4 | 3 |
|   | 3  | 9 | 3 | 2 |
|   |    | 1 |   | 1 |

| + | Th | H | T | O |
|---|----|---|---|---|
|   | 5  | 4 | 9 | 4 |
|   | 3  | 6 | 4 | 5 |
|   | 9  | 1 | 3 | 9 |
|   |    | 1 |   | 1 |

| Th | H | T | O |
|----|---|---|---|
| 7  | 1 | 6 | 3 |
| 1  | 4 | 5 | 7 |
| 8  | 6 | 2 | 0 |
|    | 1 |   | 1 |

| Th | H | T | O |
|----|---|---|---|
| 6  | 8 | 4 | 1 |
| 2  | 9 | 7 | 5 |
| 9  | 8 | 1 | 6 |
|    | 1 |   | 1 |

# Year 5

Portswood Primary School

**By the end of the year I can…**

- add whole numbers with more than 4 digits

- add numbers mentally with more than 4 digits

- use rounding to check calculations and accuracy

- solve multi - step problems

- explain the method I used and why

## Additional support

To support our children we use **concrete apparatus** with adding within hundreds. These could be dienes, counters or objects. We also add numbers that **do not** require exchanging. We then progress onto **pictorial** support.

## Core methods

In Year 5 we continue teaching our children compact column method *(as previously taught in Year 4).* We focus on adding 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 children we add decimals, as well as introducing reasoning and problem solving.

Exchange   Add      Addition      Sum      Total
Altogether   Plus      Combined   Increase
Place value holder   Ones/ tens/ hundreds/
thousands   tenths/ hundredths

# Year 5

## Steps

Portswood Primary School

1.  Write number sentence in **compact column method**

**Make sure we put our numbers in the right columns**

2.  Add ones and record total added *(e.g. 12 = 1 ten and 2 ones)*
    *(Exchange tens over into the next place value holder if needed)*

3.  Add tens and record total added – *(e.g. 110 =1 hundred and 1 ten)*
    *(Exchange hundreds over into the next place value holder if needed)*

**Remember to add the exchanged place value**

4.  Add remaining and work out the total
    *(Exchange place value over into the next place value holder if needed)*

We also use this method in Year 4 and 6!

# Year 5
## Children's work

```
  1 0 7 7 9
+   5 4 2 1
  1 6 2 0 0  ✓
    ₁   ₁   ₁
```

```
  5 6   1 8 4
+   3 7 3 8
  5 9 9 2 2  ✓
        ₁
```

```
  7 7 2 3 6 6
+   8 9 2 3 5
  8 6 1 6 0 1  ✓
    ₁   ₁   ₁ ₁
```

```
  2 7 8 9 9
+   2 1 1 1
  3 0 0 1 0  ✓
  ₁ ₁ ₁
```

```
  4 5 6 . 1 7
+ 2 5 4 . 8 4
  7 1 1 . 0 1  ✓
  ₁ ₁ ₁ ₁
```

# Year 6

**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 = 10 so 700 + 300 = 1000

- use formal written methods to calculate addition up to 10 million

## Additional support

To support our children we use **concrete apparatus,** such as using dienes to show exchanging. We also use place value grids and place value counters.

## Core methods

In Year 6 we continue using **compact column method** with a focus on larger numbers, as well as adding with decimals. Follow the steps on the next page to see how we present our working out!

## Beyond expectations

To challenge our higher attaining children we add larger numbers, as well as introducing reasoning and problem solving.

> exchange    add      addition  sum    total
> altogether    plus      inverse      BODMAS
> place value holder   ones/ tens/ hundreds/
> thousands   tenths/ hundredths/ thousandths

# Year 6

## Steps

1. **Write number sentence in compact column method**

|   | 4 | 5 | 6 | 5 |
|---|---|---|---|---|
| + |   | 3 | 4 | 7 |

**Make sure we put our numbers in the right columns**

2. **Add ones and record total added** *(e.g. 12 – 1 ten and 2 ones)*
   *(Exchange tens over into the next place value holder if needed)*

|   | 4 | 5 | 6 | 5 |
|---|---|---|---|---|
| + |   | 3 | 4 | 7 |
|   |   |   |   | 2 |
|   |   |   | 1 |   |

3. **Add tens and record total added** – *(e.g. 110– 1 hundred and 1 ten)*
   *(Exchange hundreds over into the next place value holder if needed)*

|   | 4 | 5 | 6 | 5 |
|---|---|---|---|---|
| + |   | 3 | 4 | 7 |
|   |   |   | 1 | 2 |
|   |   | 1 | 1 |   |

**Remember to add the exchanged place value**

4. **Add remaining and work out the total**
   *(Exchange place value over into the next place value holder if needed)*

|   | 4 | 5 | 6 | 5 |
|---|---|---|---|---|
| + |   | 3 | 4 | 7 |
|   | 4 | 9 | 1 | 2 |
|   |   | 1 | 1 |   |

## Adding decimals

We use the same method for adding decimals. We **must** make sure that we put our numbers in the correct columns and include the decimal place.

|   | 4 | 5 | 6 | 5 | . | 0 | 0 |
|---|---|---|---|---|---|---|---|
| + |   | 3 | 4 | 7 | . | 0 | 5 |
|   | 4 | 9 | 1 | 2 | . | 0 | 5 |
|   |   |   | 1 | 1 |   |   |   |

# Year 6
## Children's work

```
    9 9 . 6 0 +
    3 1 . 8 7
  1 3 1 . 4 7
        1 1
```

```
  1 1 2 . 3 +
  0 8 5 . 0
  1 9 7 3
```

```
  5 2 . 6 8
  2 7 . 6 0
  8 0 . 2 8
    1   1
```

```
    9 9   6 0 +
    5 2 . 6 8
  1 4 2 . 2 8
        1
```

```
  1   5   [9]
+   4 [6] 4
  [6] 1   5
```

```
  6 7 [3] [7]
+ [4] 5 9 7
1 1 3 3 4
```