



## Addition

### Focus: Adding with numbers up to 3 digits

In Year 3 we will move to the traditional column method and to support this, children will first apply their partitioning skills to the partitioning column method.

Introduce the partitioning column method with numbers that do not bridge so children become confident with the method itself.

2 4 6 + 1 3 2 = 3 7 8												3 3 7 + 1 8 8 = 5 2 5											
2 0 0 + 4 0 + 6						3 0 0 + 3 0 + 7						1 0 0 + 8 0 + 8											
1 0 0 + 3 0 + 2						4 0 0 + 1 1 0 + 1 5 = 5 2 5																	
3 0 0 + 7 0 + 8 = 3 7 8																							

Add units first!

Now children are ready to move on to the traditional column methods. Introduce this initially with numbers that do not bridge any boundaries. It is important children remember that it is three hundred add one hundred, NOT 3 + 1!

1 1 6 + 3 4 3 = 4 5 9												2 4 5 + 8 4 = 3 2 9											
3 4 3						2 4 5																	
+ 1 1 6						+ 8 4																	
4 5 9						3 2 9																	
						1																	

Once the method is secure children are now ready to be introduced to 'carrying' which happens when bridging in the column method. Make sure children add the units first and 'carry' numbers under the bottom line.

### Key Vocabulary

Add, more, plus, and, make, altogether, total, equal to, equals, the same as, double, most, count on, numberline, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, carry, expanded, compact.

### Key Skills

- Read and write numbers to 1000 in numerals and words.
- Add 2 digit number mentally including those that bridge 100.
- Add a 3 digit number and ones, a 3 digit number and 10s and a 3 digit number and 100s mentally.
- Estimate answers to calculations, using the inverse operation to check.
- Solve problems, including missing number problems using number facts and place value.
- Recognise the place value of each digit in a 3 digit number (hundreds, tens and units).
- Continue to practise many different mental addition strategies including adding to the nearest multiple of 10, 100, 1000 and adjusting, using number bonds, using near doubles, partitioning and recombining etc.

# Hornsby House School Calculation Methods

## Year 3

### Subtraction

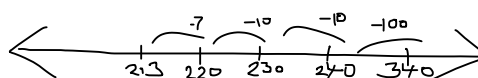


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#### Focus: Subtracting with 2 and 3 digit numbers

Children will consolidate their knowledge of counting back and counting on using a blank numberline to subtract. They will use these methods both written and mentally. Once children become fully confident they will be ready to move on to the partitioning column method of subtraction.

Children will continue to subtract on a numberline using efficient jumps and now apply these to 3 digit number problems. Here is an efficient example of  $340 - 127 =$



Children will now have the mental skills required to approach the partitioning column method of subtraction. At first they should attempt this where no exchanging is required. Here is an example for  $89 - 35 = 54$

	8	0	+	9
-	3	0	+	5
	5	0	+	4

Through practical subtraction children should be introduced to exchanging. Base 10 is a vital tool here as is a solid grounding with partitioning in different ways. It is important children realize that the value has not changed, we have just partitioned in a different way. As you can see here for  $72 - 47$ , before subtracting 7 units, a tens row will need to be exchanged for 10 units.

	60				
	<del>70</del>	+	2		
-	40	+	7		
	20	+	5	=	25

Children who are secure with the concept of 'exchanging' should now be able to use the partitioning column method to subtract any two numbers.

Once confident children are ready to move on to the compact method of subtraction. Encourage children to complete a calculation in the partitioning column methods and then model compact method. See if children can see how they are linked and discuss which is simpler.

	2	3	8	-	1	4	6	=	9	2
	2	0	0	+	3	0	+	8		
	1	0	0	+	4	0	+	6		
			0	+	9	0	+	2		

Although this is seen as the 'easiest' method it does not mean that it is necessarily the best method and they need to carefully select the best method for the problem they are solving.

#### Key Vocabulary

Equal to, take, take away, less, minus, subtract, leaves, distance between, difference between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is  $\_?$ , count on, strategy, partition, tens, units, exchange, decrease, hundreds, value, digit.

#### Key Skills

- Subtract mentally: a 3 digit number and 1s, a 3 digit number and 10s and a 3 digit number and 100s.
- Estimate answers and use the inverse (addition) to check.
- Solve problems in different contexts, including missing number problems.
- Find 10 or 100 more or less than a given number.
- Recognise the place value in a 3 digit number: 100s, 10s and 1s.
- Solving finding the difference problems using counting on.
- Reading and writing numbers up to 1000 in numerals and words.
- Practise and develop mental strategies including subtracting near multiples of 10 and adjusting, counting on etc.

# Hornsby House School Calculation Methods

## Year 3

### Multiplication



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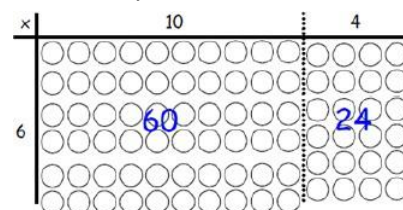
#### Focus: Multiplying 2 digit numbers by 1 digit numbers

In Year 3 children will move on from arrays and start using the grid method of multiplication. It is essential that before children move onto the grid method they are completely confident with all previous methods and have a solid grounding with mental methods and partitioning.

#### Before moving on to grid multiplication, children need to be able to ...

- Partition numbers into tens and units
- Multiply single digits by multiples of 10 ( $3 \times 30 = 90$ ).
- Quickly recall multiplication facts for the 2, 3, 4, 5, 6 and 10x tables.
- Use any previous method to work out unknown multiplication facts, quickly and accurately.

The grid method should be introduced using an arrays model such as the one to the right for  $14 \times 6$ . Children need to use their partitioning skills to partition the two digit number and then use their existing knowledge of arrays to come to an answer with minimal support.



Multiplication using the grid method requires good organisation but also a solid understanding of partitioning and multiplication facts, as you can see in the example below for  $35 \times 7$ . The children need to remember that once they have multiplied the partitioned parts of the number, they then need to add the two.

x	30	5
7	210	35
	210 + 35 = 245	

#### Key Vocabulary

Groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times, partition, grid method, multiple, product, tens, units, value

#### Key Skills

- Recall and use multiplication facts for the 2, 3, 4, 5, 6 and 10 multiplication tables and multiply multiples of 10.
- Write and calculate number sentences using known x tables.
- Answer 2 digit x 1 digit problems using mental and written methods.
- Solve multiplication problems in context including missing number problems.
- Develop mental strategies using commutativity (e.g.  $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$ ) and for missing number problems.

# Hornsby House School Calculation Methods

## Year 3

### Division

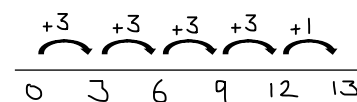


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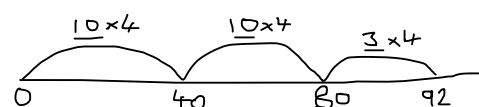
**Focus: Dividing 2 digit numbers by 1 digit numbers, moving from numberline methods to short division**

Children in Year 3 will continue to use a numberline to solve division problems and will begin to jump more than one step at a time in the style of 'chunking'. Once confident they will move on to short division without any remainders.

Children will begin to use the grouping numberline method to solve problems with remainders. They will start on zero and write the dividend at the end of their numberline. They will jump in steps of the divisor until they get as close to the end as possible. Whatever is left over is the remainder. Using cubes or arrays alongside the numberline will consolidate understanding



Once confident children will begin to solve problems on a grouping numberline involving bigger numbers. To solve this effectively they will need to subtract chunks of the divisor. As you can see in the image for  $92 \div 4$ , a step of 10 groups of 4 has been jumped, followed by another step of 10 jumps, finally followed by a step of 3 jumps of 4. This means that in total 4 was jumped 23 times making 23 the answer.



Once children are confident with numberline methods then they should start work on short division. Initially children will start with simple problems where each digit is a multiple of the divisor. First, arrays should be used to show a division calculation, then the same calculation should be shown in the short multiplication method. Place value should be regularly discussed so children realise that they are partitioning the dividend and dividing the units then then tens by the divisor.

	3	2	
3	9	6	

### Key Vocabulary

Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, *inverse*, *short division*, *carry*, *remainder*, *multiple*.

### Key Skills

- Recall and use and  $\div$  facts for the 2, 3, 4, 5, 6, 8 and 10x tables (using doubling to connect the 2, 4 and 8x tables)
- Solving division problems where a 2 digit number is divided by a 1 digit number using mental and written methods.
- Solve problems in a variety of contexts including missing number problems.
- Pupils begin to derive related facts e.g.  $9 \div 3 = 3$  means  $90 \div 3 = 30$  or  $90 \div 30 = 3$ .
- Pupils develop confidence in written methods, moving from numberlines to short division.