

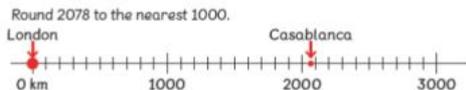


Key concepts that will be covered

Numbers to 10 000

We will embed our understanding of number by counting to 10 000 in multiples of 25, 100 and 1000. We will develop our understanding of place value by using concrete apparatus to represent numbers.

We will compare and order 4 digit numbers and learn to create and interpret number patterns by using our knowledge of place value. We will learn to round numbers to the nearest 10, 100 and 1000 and use this knowledge to estimate numbers. We will begin to understand that numbers less than one exist.



2078 is between 2000 and 3000.
2078 is closer to 2000 than to 3000.

We say 2078 is 2000 when rounded to the nearest 1000.

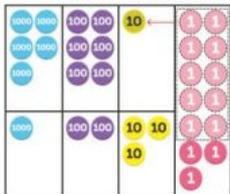


Addition and Subtraction within 10 000

We will learn to add and subtract with numbers up to 10 000. We will learn mental methods and column methods for addition and subtraction. We will be encouraged to think about when is the most appropriate time to use each method. We will use the methods taught to solve word problems: visualising the problems using the bar model.

Find the sum of 5608 and 1235.

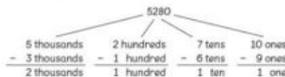
Step 1 Add the ones. 8 ones + 5 ones = 13 ones
Rename the ones. 13 ones = 1 ten and 3 ones



$$\begin{array}{r} 5608 \\ + 1235 \\ \hline 6843 \end{array}$$



$$\begin{array}{r} 5280 \\ - 3169 \\ \hline 2111 \end{array}$$



5280 - 3169 = 2111

£2111 was left.

Arithmetic

Counting

Count in multiples of 6, 7, 9, 25 and 100

Count from 0 in sixes. What number would come next in this counting sequence? 0, 7, 14, 21, 28, __

What number is missing from this counting sequence? 0, 25, 50, 100, 125

Count backwards through zero to include negative numbers.

What number would come next in this counting sequence? 5, 0, -5, -10,

Count up and down in hundredths.

Count from 0 in hundredths. Count back from $\frac{34}{100}$ to $\frac{15}{100}$

Continue this sequence: 0.06, 0.07, 0.08...

Find 0.1, 1, 10, 100 or 1000 more or less than a given number.

What is 1000 more than 2345? 10 less than 709 is ____.

What is one tenth more than 5.9? What is 100 less than 1176?

What is 100 less than 1076?

Number Facts

Recall and use addition and subtraction facts for 100

$$100 - 33 = _ \quad 24 + _ = 100 \quad 100 = _ + 71$$

$$100 - 49 = _ \quad 100 - _ = 19 \quad 68 = 100 - _$$

Recall and use addition and subtraction facts for multiples of 100 totalling 1000

$$1000 - 400 = _ \quad 200 + _ = 1000 \quad 1000 = _ + 100$$

Recall multiplication and division facts for multiplication tables up to 12 x 12

$$7 \times 6 = _ \quad 48 = 12 \times _ \quad 3 \times _ = 27 \quad _ \times _ = 35$$

$$45 \div 9 = _ \quad _ \div 8 = 11 \quad 12 = 108 \div _$$

Multiplying by 0 and 1

$$354 \times 1 = _ \quad 803 \times _ = 803 \quad 1734 = 1 \times _$$

$$354 \times 0 = _ \quad 803 \times _ = 0 \quad 0 = 0 \times _$$

Dividing by 1

$$542 \div 1 = _ \quad 607 = 607 \div _ \quad 38 = _ \div 1$$

Recognise and use factor pairs and commutativity in mental calculations.

$$60 \times 3 = 6 \times 10 \times 3 \text{ reordered to give } 6 \times 3 \times 10 = 180$$

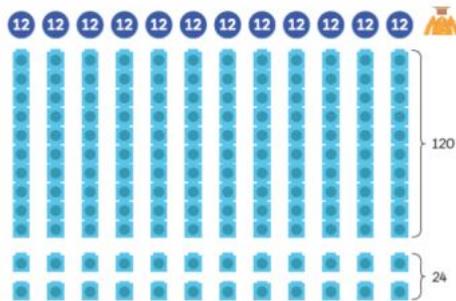
$$14 \times 4 = 7 \times 2 \times 4 \text{ with order of calculations being } 7 \times (2 \times 4) = 56$$



Key concepts that will be covered

Multiplication and Division

We will learn how to multiply and divide by 6, 7, 9, 11 and 12. We will begin to understand mathematical vocabulary such as 'quotient' in relation to division. We will learn how to calculate multiplication equations using the multiplication facts that we know. We will understand the difference between sharing and grouping and we will understand the commutative law in multiplication. We will also solve problems involving multiplication and division.



$$12 \times 12 = 120 + 24 \\ = 144$$

Further Multiplication and Division

We will further develop our understanding of multiplication and division. We will learn how to divide and multiply by 1 and 0 and understand the law of commutativity. We will learn how to multiply three numbers together using our knowledge of multiplication tables. We will use our tables and knowledge of place value to multiply multiples of ten leading to the multiplication of 2-digit numbers using short multiplication. We will use our knowledge of multiplying multiples of ten when multiplying multiples of 100 leading to multiplying 3-digit numbers using short multiplication.

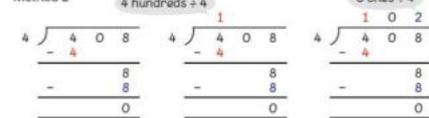
$$408 \div 4 = \square$$



Method 1



Method 2



$$408 \div 4 = 102$$

She got 102 boxes.

Arithmetic

Mental Calculation Strategies – Addition and Subtraction
Derive and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)

$$\begin{array}{lll} 0.5 + \underline{\quad} = 1 & 2.3 + \underline{\quad} = 10 & \underline{\quad} + 0.7 = 1 \\ \underline{\quad} + 8.2 = 10 & 1 = 0.3 + \underline{\quad} & 10 = 5.6 + \underline{\quad} \\ 1 = \underline{\quad} + 0.8 & 10 = \underline{\quad} + 2.2 & 1 - 0.8 = \underline{\quad} \\ 10 - 6.1 = \underline{\quad} & 1 - \underline{\quad} = 0.6 & 10 - \underline{\quad} = 4.9 \end{array}$$

Partition and combine multiples of hundreds, tens and ones.

$$\begin{array}{ll} 320 + 150 & 320 \text{ add } 100 = 420 \text{ then add } 50 = 470 \\ 243 + 230 & 243 \text{ add } 200 = 443 \text{ then add } 30 = 473 \\ 460 - 140 & 460 \text{ subtract } 100 = 360 \text{ then subtract } 40 = 320 \\ 85 + 47 & 85 \text{ add } 40 = 125 \text{ then add } 7 = 132 \end{array}$$

(crossing hundreds and tens boundaries)

$$122 - 35 \quad 122 \text{ subtract } 30 = 92 \text{ then subtract } 5 = 87$$

(crossing hundreds and tens boundaries)

Reorder numbers in a calculation

$7 + 12 + 3 + 5$ reordered as $7 + 3 + 12 + 5$ to make use of the bond to 10
 $18 + 6 - 8 - 8$ reordered as $18 - 8 + 6$ to make use of the place value of 18
 $27 + 75$ reordered as $75 + 27$ to make use of $75 + 25$ seeing 27 as $25 + 2$

Identify and use knowledge of number bonds within a calculation and identify related facts, e.g. $150 + 270$ from $15 + 27$

$120 + 80$ using knowledge of $12 + 8 = 20$

$200 - 70$ using knowledge of $20 - 7 = 13$

Find differences by counting up through the next multiple of 10 or 100

$80 - 43$ $43 + 7 = 50 + 30 = 80$ so the difference is **37**
 $92 - 35$ $35 + 5 = 40 + 50 = 90 + 2 = 92$ so the difference is **57**

Bridge through 10 when adding or subtracting a single digit number (partitioning), e.g. $58 + 5 = 58 + 2 + 3$ or $76 - 8 = 76 - 6 - 2$

$48 + 35$ as $48 + 2 + 33 = 50 + 33 = 83$

$230 - 72$ as $230 - 30 - 40 - 2 = 200 - 40 - 2$

Add or subtract a multiple of 10 and adjust (for those numbers close to multiples of 10)

$167 + 48$ as $167 + 50 - 2 = 217 - 2 = 215$

$96 - 38$ as $96 - 40 + 2 = 56 + 2 = 58$



Key concepts that will be covered

Completion of Further
Multiplication and Division

We will learn more about division and will divide 2-digit numbers using chunking and short division: this includes numbers with remainders. We will learn to solve multiplication and division problems using the methods we have learned and will use the bar model to help visualise what the problem is asking us to do.

Emma spent 6 days folding some paper cranes. She folded 32 paper cranes each day. She needs to fold 250 paper cranes altogether. How many more paper cranes does she need to fold?

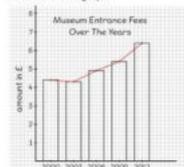
$32 \times 6 = 192$
 Emma folded 192 paper cranes in 6 days.
 $250 - 192 = 58$
 Emma needs to fold 58 more paper cranes.



Graphs

We will learn how to interpret picture graphs and bar graphs. We will be introduced to line graphs and how they are used to measure change over time. We will interpret line graphs and use information collated in a table to draw a line graph. We will learn to make predictions based on trends identified in data.

We can use a line graph.



Each dot on the graph tells you the museum entrance fee for one particular year.

Fractions

We will be using concrete apparatus to learn about mixed number fractions and improper fractions. We will learn about hundredths using concrete apparatus. We will learn how to convert between mixed numbers and improper fractions. We will learn how to add and subtract fractions and we will solve addition and subtraction word problems.



$$\frac{1}{5} \text{ and } \frac{3}{5} \text{ make } \frac{4}{5}$$

$$\frac{4}{5} < 1$$

1 fifth and 3 fifths



$$\frac{2}{5} \text{ and } \frac{4}{5} \text{ make } 1 \text{ and } \frac{1}{5}$$

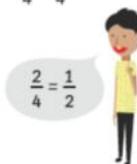
$$1\frac{1}{5}$$



$$1\frac{1}{4} - \frac{3}{4} = \frac{5}{4} - \frac{3}{4} = \frac{2}{4}$$

$$1\frac{1}{4} - \frac{3}{4} = \frac{1}{2}$$

There is $\frac{1}{2}$ kg of flour left in the sack.



Arithmetic

Mental Calculation Strategies –
Multiplication and Division

Multiply a one- or two-digit number by 10 and 100

7×10

9×100

71×10

63×100

Use related facts to multiply H00 by a one-digit number

$7 \times 6 = 42$

$\text{then } 700 \times 6 = 4200$



600×7 related to $6 \times 7 = 42$

This should be understood as 'six hundred sevens'.

As the number of 7s is 100 times greater than six sevens, so the product is 100x greater.

Use factor pairs to multiply H00 by a one-digit number.

600×7 becomes $6 \times 100 \times 7$ reordered as $6 \times 7 \times 100$

500×8 becomes $5 \times 100 \times 8$ reordered as $5 \times 8 \times 100$

Use compensation to multiply T9 by a one-digit number.

NB T9 represents a two-digit number with 9 ones

49×3 considered as $50 \times 3 - 1 \times 3$ (read as 'fifty threes subtract one three')

29×7 considered as $30 \times 7 - 1 \times 7$ (read as 'thirty sevens subtract one seven')

Use related facts to multiply TU \times 5 (by multiplying by 10 and halving).

28×5 becomes $28 \times 10 = 280$ then $280 \div 2 = 140$

81×5 becomes $81 \times 10 = 810$ then $810 \div 2 = 405$

Use related facts to multiply TU \times 20 (by multiplying by 10 and doubling).

34×20 becomes $34 \times 10 = 340$ then $340 \times 2 = 680$

47×20 becomes $47 \times 10 = 470$ then $470 \times 2 = 940$



By the end of the unit children should be able to work through these.

Time

Elliott has a watch that loses 2 minutes every hour.
Charles has a watch that gains 1 minute every hour.
They both set their watches at 6:00 a.m. and got on a bus.
When they got off the bus, the times on their watches were 15 minutes apart.
At what time did they get off the bus?



I know how to...

- tell time using the 24-hour clock.
- change time in minutes to seconds.
- change time in hours to minutes.
- change time in years to months.
- change time in months to years.
- find the duration, starting time and finishing time.
- solve word problems on time.

Self Check

Decimals

Use a calculator to observe the decimal number we get when 1 is divided by another whole number.

$1 \div 2 =$	<input type="text"/>	$1 \div 8 =$	<input type="text"/>
$1 \div 3 =$	<input type="text"/>	$1 \div 9 =$	<input type="text"/>
$1 \div 4 =$	<input type="text"/>	$1 \div 10 =$	<input type="text"/>
$1 \div 5 =$	<input type="text"/>	$1 \div 11 =$	<input type="text"/>
$1 \div 6 =$	<input type="text"/>	$1 \div 12 =$	<input type="text"/>
$1 \div 7 =$	<input type="text"/>		

Is it possible to tell the digit in the 10th decimal place in each case?



1st
 $1 \div 7 = 0.14285714$
 8th

I know how to...

- recognise and write tenths.
- recognise and write hundredths.
- compare numbers with the same number of decimal places.
- complete number patterns involving decimals.
- round decimals with one decimal place to the nearest whole number.
- recognise and write decimal equivalents of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.
- divide a 1- or 2-digit number by 10.
- divide a 1- or 2-digit number by 100.
- solve simple measure and money problems involving decimals.

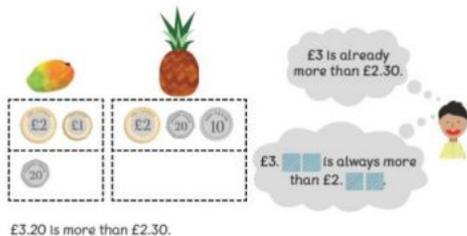
Self Check



Key concepts that will be covered

Money

We will be learning how to count and record in pounds and pence. We will make links between tenths and hundredths and decimal notation for money. We will learn how to compare amounts of money by looking at significant digits and by converting amounts from pounds to pence and vice versa. We will learn how to round money to the nearest pound, and we will understand the contexts in which this would be a useful skill to know, like estimating. We will apply our learning to problem solving - finding totals and calculating change. We will be using the bar model to visualise money problems. We will begin to explore unequal sharing in the context of money.



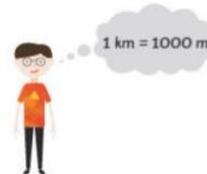
Mass, Volume and Length

We will be learning how to estimate and measure mass, volume and length. We be learning how to convert units of measure from larger to smaller and vice versa. We will embed our understanding of measuring perimeter using cm and mm. We will solve problems involving mass, volume and length.

$$10 \text{ km} = \text{ } \text{ m}$$

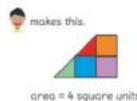
$$10 \text{ km} = 10\,000 \text{ m}$$

$$10 \text{ km} = 10\,000 \text{ m}$$



Area of Figures

We understand the concept of area by measuring surface coverage: i.e. counting squares before measuring area by using multiplication. We will find the areas of figures that have squares and rectangles by counting and visualising. We will learn how to apply our knowledge of finding the area of figures in different orientations.



Arithmetic

Progression Towards Written Calculation Strategies – Addition

This is the final stage of the method and should be continued to be used for all written addition calculations.

The first example would be explained as follows:

$5 + 8 = 13$, put 3 down and carry the 10 (*written as a 1 in the tens column*)

$20 + 40 + 10$ that was carried over = 70 (*7 written in the tens column*)

$600 + 0 = 600$ (*6 written in the hundreds column*)

Children will be expected to use this method for adding numbers with more than 3 digits, numbers involving decimals and adding any number of amounts together.

HTU		321	
$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array}$	$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$	$\begin{array}{r} + 7 \\ + 48 \\ \hline 376 \\ 1 \end{array}$	$\begin{array}{r} \text{£}3.48 \\ + \text{£}0.78 \\ \hline \text{£}4.26 \\ 11 \end{array}$

Progression Towards Written Calculation Strategies – Subtraction

This is the final stage of the process and will continue to be used with greater numbers and numbers involving decimals.

$\begin{array}{r} 754 \\ - 86 \\ \hline \end{array}$	expanded	$\begin{array}{r} 600 \\ \cancel{700} \end{array} \rightarrow \begin{array}{r} 140 \\ \cancel{50} \end{array} \rightarrow 14$ $\begin{array}{r} - \\ \hline 80 \end{array} \rightarrow \begin{array}{r} 6 \\ \hline \end{array}$	$\begin{array}{r} 600 \rightarrow 60 \rightarrow 8 = 668 \end{array}$
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The example shown would be explained as follows:

We are subtracting 86 from 754. Start with the least significant place value column.

Are there enough ones to subtract 6?

No – so let's exchange a ten from the tens column for ten ones. 5 tens and 4 ones become 14 ones.

14 subtract 6 = 8

Are there enough tens to subtract 80?

No – so let's exchange a hundred from the hundreds column for ten tens. 7 hundreds and becomes 6 hundreds and 14 tens.

14 tens (140) subtract 8 tens (80) = 6 tens (60)

$600 - 0 = 600$

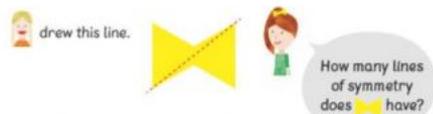
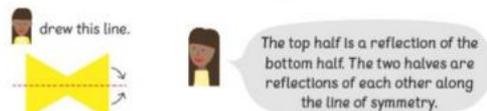
Answer 668



Key concepts that will be covered

Geometry

We will be learning to name and compare angles and use this information to help us when classifying triangles and quadrilaterals. We will explore symmetry and symmetrical figures before applying this knowledge to the completion of symmetrical figures. We will draw lines of symmetry on shapes and figures and will combine this knowledge and understanding to sort a variety of 2-D shapes.

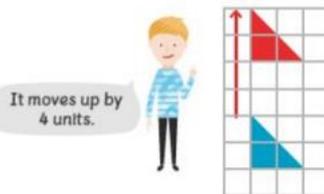


Why is this not a line of symmetry?

Position and Movement

We will be learning how to describe the positions of objects and figures. We will understand how we can describe positions on grids using coordinates. We will be introduced to the x and y axes and how coordinates are written. We will learn how to translate shapes using the language of 'left', 'right', 'upwards' and 'downwards' and will use coordinates to describe a figure following a translation.

Describe  's movement into the position shown by .



Roman Numerals

We will learn to write the Roman numerals to 100, exploring the patterns involved and exploring other concepts of number whilst learning about this number system.

The Romans did not use place value or zero. When they needed a larger number, they used a new letter.

V = 5
L = 50

X = 10
C = 100

Find out how the Romans wrote the numbers 20, 30, 40 and so on.

Arithmetic

Progression Towards Written Calculation Strategies – Multiplication

In this stage, the array is removed and children use the grid method.

This is an important step in retaining children's understanding of multiplication.

$$160 + 24 = 184$$

$$23 \times 8$$

$$\begin{array}{r} \times \quad 20 \quad 3 \\ 8 \quad \boxed{160} \quad \boxed{24} \end{array}$$

Progression Towards Written Calculation Strategies – Division

This is the 'chunking' method of division in which children use key facts from the multiplication tables of the divisor.

The repeated subtraction is made more efficient by subtracting 'chunks' of the divisor and where steps are repeated, children are encouraged to combine these to make the process more efficient.

$\begin{array}{r} 24 \\ 3 \overline{)72} \\ \underline{-30} \\ 42 \\ \underline{-42} \\ 0 \end{array}$	$\begin{array}{l} 1x = 3 \\ 2x = 6 \\ 5x = 15 \\ 10x = 30 \end{array}$	$\begin{array}{r} 24 \\ 3 \overline{)72} \\ \underline{-60} \\ 12 \\ \underline{-12} \\ 0 \end{array}$	$\begin{array}{r} 32 \text{ r}4 \\ 6 \overline{)196} \\ \underline{-180} \\ 16 \\ \underline{-12} \\ 4 \end{array}$	$\begin{array}{l} 1x = 6 \\ 2x = 12 \\ 5x = 30 \\ 10x = 60 \\ 20x = 120 \end{array}$
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