

# Mathletics

## England Key Stage 2

### Understanding Practice and Fluency (UPF)



**Grades 3 – 6**

September, 2021

**Mathletics**

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England Programme of Study – Key Stage 2  
Understanding, Practice and Fluency (UPF)  
September, 2021

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# Part I

## Year 3

### 1 Number

#### 1.1 Number and place value

Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number			
Quest: Count in multiples of 4, 8, 50 and 100			
Learning Journey	Steps	Content	Description
Counting in multiples of 4	1	Counting by skip counting forwards by 4s from zero up to 40	• use concrete materials, models, drawings, number lines/charts to skip count by 4s from zero
			• use rhythmic counting to count in 4s from zero
			• recognise an error in the skip counting sequence
Counting in multiples of 8	1	Counting in multiples of 8 to 96	• count in multiples of 8
Counting in multiples of 50	1	Counting by skip counting forwards by 50s from any multiple of 50 up to 500	• use concrete materials, models, drawings, number lines/charts to skip count by 50s from any multiple of 50
			• use knowledge of the number sequence to count in 50s from any multiple of 50
			• recognise an error in the skip counting sequence
	2	Counting by skip counting backwards by 50s from any multiple of 50 from 500	• use concrete materials, models, drawings, number lines/charts to skip count backwards by 50s
			• use knowledge of the number sequence to count backwards in 50s from any multiple of 50
			• recognise an error in the skip counting sequence
	3	Counting by skip counting forwards or backwards by 50s from any multiple of 50 from zero to 500	• use concrete materials, models, drawings, number lines/charts to skip count by 50s
			• use knowledge of the number sequence to count forwards or backwards in 50s from any multiple of 50
			• recognise an error in the skip counting sequence
Counting in multiples of 100	1	Counting by skip counting forwards or backwards by 100s from any multiple of 100 up to 1000	• use concrete materials, models, drawings, number lines/charts to skip count forwards or backwards by 100s from any multiple of 100 up to 1000
			• skip count forwards or backwards by 100s from any multiple of 100 using understanding of the number sequence and place value up to 1000

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• recognise an error in the skip counting sequence</li> </ul>
<b>Quest: Find 10 or 100 more or less</b>			
Finding 10 or 100 more or less than a number	1	Finding numbers 10 or 100 before and after up to 1,000	<ul style="list-style-type: none"> <li>• find the number '10 before' or '10 after' a given 2-digit, 3-digit or 4-digit number on or off the decade using number lines and number charts</li> <li>• find the number '100 before' or '100 after' a given 3-digit or 4-digit number on or off the decade using number lines and number charts</li> </ul>

Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)			
<b>Quest: Recognise place value of 3-digit numbers</b>			
Learning Journey	Steps	Content	Description
Recognising place value of 3-digit numbers	1	Identifying the place value of digits in 3-digit numbers	<ul style="list-style-type: none"> <li>• write the numeral for a 3-digit number modelled using place value equipment</li> <li>• identify the digit in the hundreds, tens or ones column for a given 3-digit number</li> <li>• recognise that the value of the digit is determined by its place value, eg in 689 the digit 8 has a place value of tens and a total value of 80</li> <li>• identify, record and model a number using place value clues, eg 'a 5 in the hundreds and a 2 in the ones' as 502</li> <li>• recognise the role of zero as a placeholder</li> <li>• create the smallest and largest numbers possible using 3 digits</li> </ul>

Compare and order numbers up to 1,000			
<b>Quest: Compare and order numbers up to 1,000</b>			
Learning Journey	Steps	Content	Description
Comparing numbers up to 1,000	1	Comparing 3-digit numbers represented by models	<ul style="list-style-type: none"> <li>• compare two numbers shown as place value objects and record using inequality symbols eg, Base 10, place value counters, part-whole models</li> </ul>
	2	Comparing numbers to 1,000	<ul style="list-style-type: none"> <li>• model and compare two 3-digit numbers using place value equipment</li> <li>• compare two 3-digit numbers; describe as 'more than' or 'less than', 'smaller than', greater than'</li> </ul>
	3	Comparing numbers to 1,000 using <, = and > symbols	<ul style="list-style-type: none"> <li>• model and compare two 3-digit numbers using place value equipment</li> <li>• compare two 3-digit numerals using &lt;, = and &gt; symbols</li> </ul>

Learning Journey	Step	Content	Description
Ordering numbers up to 1,000	1	Ordering numbers to 1,000	<ul style="list-style-type: none"> <li>order up to 4 consecutive numbers within 1,000 in ascending order or descending order; explain the reason for the order given</li> </ul>
			<ul style="list-style-type: none"> <li>order up to 4 non-consecutive numbers within 1,000 in ascending order; explain the reason for the order given</li> </ul>

Identify, represent and estimate numbers using different representations			
Quest: Identify and represent numbers			
Learning Journey	Steps	Content	Description
Identifying 3-digit numbers within 1,000	1	Identifying numbers before and after within 1,000	<ul style="list-style-type: none"> <li>identify the number that comes after a given 3-digit number up to 1,000; describe this number as 'one more than'</li> </ul>
			<ul style="list-style-type: none"> <li>identify the number that comes before a given 3-digit number up to 1,000; describe this number as 'one less than'</li> </ul>
			<ul style="list-style-type: none"> <li>identify the number that comes after or before a given 3-digit number up to 1,000; describe this number as 'one more than' or 'one less than'</li> </ul>
Using place value to partition 3-digit numbers	1	Using place value to partition 3-digit numbers	<ul style="list-style-type: none"> <li>use place value equipment to partition a given 3-digit number into hundreds, tens and ones</li> </ul>
			<ul style="list-style-type: none"> <li>describe a 3-digit number using words, eg 523 as '5 hundreds, 2 tens and 3 ones'</li> </ul>
			<ul style="list-style-type: none"> <li>write a 3-digit number in expanded notation, eg 523 as <math>500 + 20 + 3</math></li> </ul>
			<ul style="list-style-type: none"> <li>write the numeral for a number represented by expanded notation</li> </ul>
			<ul style="list-style-type: none"> <li>recognise zero as a placeholder</li> </ul>
	2	Partitioning 3-digit numbers using non-standard partitioning	<ul style="list-style-type: none"> <li>use place value equipment to partition a given 3-digit number using non-standard partitioning, eg 375 as 2 hundreds and 175 ones or <math>200 + 175</math></li> </ul>
			<ul style="list-style-type: none"> <li>model and identify a number from non-standard partitioning, eg recognise 3 hundreds, 4 tens and 27 ones or <math>300 + 40 + 27</math> as 367</li> </ul>

Read and write numbers up to 1,000 in numerals and in words			
Quest: Read and write numbers up to 1,000			
Learning Journey	Steps	Content	Description
Reading and writing numbers up to 1,000	1	Reading and writing 3-digit numbers using numeral only	<ul style="list-style-type: none"> <li>read a given 3-digit number in words, eg 456 says 'four hundred and fifty-six'</li> </ul>
			<ul style="list-style-type: none"> <li>write the numerals for a 3-digit number given verbally in words</li> </ul>

Learning Journey	Step	Content	Description
	2	Reading and writing 3-digit numbers using words and numerals	<ul style="list-style-type: none"> <li>• write a given 3-digit number in words, eg 456 as four hundred and fifty-six</li> </ul>
			<ul style="list-style-type: none"> <li>• write the numerals for a 3-digit number given in words</li> </ul>



## 1.2 Addition and subtraction

Add and subtract numbers mentally, including: a three-digit number and 1s, a three-digit number and 10s, a three-digit number and 100s			
Quest: Add with 3-digit numbers			
Learning Journey	Steps	Content	Description
Adding a 3-digit number and 1s using models	1	Adding a 1-digit number and a 3-digit number, no exchange, using models	<ul style="list-style-type: none"> <li>add a 1-digit number to a 3-digit number using models and tables, eg, <math>234 + 3 = ?</math></li> </ul>
Adding a three-digit number and 10s using models	1	Adding a multiple of 10 to a 3-digit number not crossing the 100	<ul style="list-style-type: none"> <li>add a multiple of 10 to a 3-digit number not crossing the 100, using models and tables, eg <math>239 + 40 = ?</math></li> </ul>
	2	Adding a multiple of 10 to a 3-digit number with an exchange	<ul style="list-style-type: none"> <li>add a multiple of 10 to a 3-digit number not crossing the 100, using models and tables, eg, <math>269 + 40 = ?</math></li> </ul>
Adding up to 3 digits (bridging strategy)	1	Adding 2 numbers up to 3-digits using bridging to ten	<ul style="list-style-type: none"> <li>add up to two 3-digit numbers where the first number has a 7, 8, or 9 in the ones columns, by first adding to the nearest ten and then adding the rest, eg <math>368 + 25</math> as <math>368 + 2 + 23</math></li> </ul>
			<ul style="list-style-type: none"> <li>record and explain the strategy using numerals, models and/or diagrams</li> </ul>
Adding up to 3 digits (jump strategy)	1	Adding 2-digit and 3-digit numbers using place value partitioning on a number line (jump strategy)	<ul style="list-style-type: none"> <li>model and solve the addition of a 2-digit and 3-digit number using an empty number line, eg <math>823 + 56</math> as <math>823 + 50 = 873</math>, <math>873 + 6 = 879</math></li> </ul>
	2	Adding 2-digit and 3-digit numbers mentally using place value understanding (jump strategy)	<ul style="list-style-type: none"> <li>mentally solve addition problems involving 2-digit and 3-digit numbers using a jump strategy, eg <math>823 + 56</math> as <math>823 + 50 = 873</math>, <math>873 + 6 = 879</math></li> </ul>
			<ul style="list-style-type: none"> <li>record and explain the use of the strategy</li> </ul>
	3	Adding up to 3-digit numbers mentally using place value understanding (jump strategy)	<ul style="list-style-type: none"> <li>check calculations using the inverse operation</li> </ul>
			<ul style="list-style-type: none"> <li>solve the addition of two 3-digit numbers using a jump strategy, eg <math>823 + 356</math> as <math>823 + 300 = 1123</math>, <math>1123 + 50 = 1173</math>, <math>1173 + 6 = 1179</math></li> <li>explain and justify the use of the strategy</li> </ul>
Adding up to 3-digit numbers (split strategy)	1	Adding a 2-digit and 3-digit number using place value models (split strategy)	<ul style="list-style-type: none"> <li>model the addition of a 2-digit and 3-digit number using a split strategy with or without crossing tens; use place value equipment, money or diagrams</li> </ul>
			<ul style="list-style-type: none"> <li>solve addition problems using a split strategy, eg <math>265 + 27</math> as <math>260 + 20</math> and <math>5 + 7</math>, <math>280 + 12 = 292</math></li> </ul>
	2	Adding up to two 3-digit numbers mentally using place value understanding (split strategy)	<ul style="list-style-type: none"> <li>record and explain the use of the strategy</li> </ul>
	2	Adding up to two 3-digit numbers mentally using place value understanding (split strategy)	<ul style="list-style-type: none"> <li>solve addition problems using a split strategy, eg <math>265 + 327</math> as <math>200 + 300</math>, <math>60 + 20</math> and <math>5 + 7</math>, <math>500 + 80 + 12 = 592</math></li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>record and explain the strategy using numerals, models and/or diagrams</li> </ul>
<b>Quest: Subtract with 3-digit numbers</b>			
Subtracting a 3-digit number and 1s using models	1	Subtracting a 1-digit number from a 3-digit number, no exchange, using models	<ul style="list-style-type: none"> <li>subtract a 1-digit number from a 3-digit number using models and tables, eg <math>356 - 4 = ?</math></li> </ul>
	2	Subtracting a 1-digit number from a 3-digit number (exchange within 10)	<ul style="list-style-type: none"> <li>subtract a 1-digit number from a 3-digit number with exchange within 10, using models and tables, eg <math>346 - 7 = ?</math></li> </ul>
Subtracting a 3-digit number and 10s using models	1	Subtracting a multiple of 10 from a 3-digit number not crossing the 100	<ul style="list-style-type: none"> <li>subtract a multiple of 10 from a 3-digit number not crossing the 100, using models and tables, eg <math>775 - 50 = ?</math></li> </ul>
Subtracting up to 3-digit numbers (bridging to 10)	1	Bridging to ten to subtract two 2-digit numbers using models for support	<ul style="list-style-type: none"> <li>subtract to the nearest ten first then subtract the rest using models for support, eg <math>33 - 18</math> as <math>33 - 3 - 10 - 5</math></li> </ul>
			<ul style="list-style-type: none"> <li>record and explain the use of the strategy</li> </ul>
	2	Subtracting 2 numbers up to 3-digits using bridging to ten	<ul style="list-style-type: none"> <li>subtract two numbers (up to 3-digits) where the first number has a 1, 2 or 3 in the ones columns, by first subtracting to the nearest ten and then subtracting the rest, eg <math>362 - 25</math> as <math>362 - 2 - 23</math></li> </ul>
			<ul style="list-style-type: none"> <li>record and explain the strategy using numerals, models and/or diagrams</li> </ul>
Subtracting up to 3-digit numbers (jump strategy)	1	Subtracting up to 3-digit numbers mentally using place value understanding (jump strategy)	<ul style="list-style-type: none"> <li>solve the subtraction of two 3-digit numbers using a jump strategy, eg <math>823 - 356</math> as <math>823 - 300 = 523</math>, <math>523 - 50 = 473</math>, <math>473 - 6 = 467</math></li> </ul>
			<ul style="list-style-type: none"> <li>explain and justify the use of the strategy</li> </ul>
	2	Subtracting a 2-digit number from a 3-digit number using place value partitioning on a number line (jump strategy)	<ul style="list-style-type: none"> <li>model and solve the subtraction of a 2-digit number from a 3-digit number using an empty number line, eg <math>823 - 56</math> as <math>823 - 50 = 773</math>, <math>773 - 6 = 767</math></li> </ul>
	3	Subtracting a 2-digit number from a 3-digit number mentally using place value understanding (jump strategy)	<ul style="list-style-type: none"> <li>mentally solve subtraction problems involving 2-digit and 3-digit numbers using place value partitioning, eg <math>823 - 56</math> as <math>823 - 50 = 773</math>, <math>773 - 6 = 767</math></li> </ul>
			<ul style="list-style-type: none"> <li>record and explain the use of the strategy</li> </ul>
			<ul style="list-style-type: none"> <li>check calculations using the inverse operation</li> </ul>
Subtracting up to 3-digit numbers (split strategy)	1	Subtracting a 2-digit number from a 3-digit number using place value models (split strategy)	<ul style="list-style-type: none"> <li>model the subtraction of a 2-digit and 3-digit number using a split strategy; place value equipment, money or diagrams</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• solve subtraction problems using a split strategy, eg <math>265 - 21</math> as <math>260 - 20</math> and <math>5 - 1</math>, <math>240 + 4 = 244</math></li> <li>• record and explain the use of the strategy</li> </ul>
			<ul style="list-style-type: none"> <li>• solve subtraction problems using a split strategy, eg <math>548 - 127</math> as <math>500 - 100</math> and <math>40 - 20</math> and <math>8 - 7</math>, <math>400 + 20 + 1 = 421</math></li> <li>• record and explain the strategy using numerals, models and/or diagrams</li> </ul>
	2	Subtracting two 3-digit numbers mentally using place value understanding (split strategy)	
<b>Quest: Add and subtract 3-digit numbers</b>			
Adding and subtracting multiples	1	Adding and subtracting multiples of 10 from 3-digit numbers, not crossing the 100	<ul style="list-style-type: none"> <li>• add and subtract a multiple of 10 from a 3-digit number not crossing the 100, using models and tables</li> </ul>
	2	Adding and subtracting multiples of 100 from a 3-digit number using models	<ul style="list-style-type: none"> <li>• add multiples of 100 to any 3-digit number using models to solve missing numbers, eg <math>675 = 475 + 200</math>, eg bar models, place value grid, Base ten</li> <li>• subtract multiples of 100 from any 3-digit number using models to solve missing numbers eg <math>675 - 200</math>, eg bar models, place value grid, Base ten</li> <li>• add and subtract multiples of 100 from any 3-digit number using models eg, bar models, place value grid, Base ten</li> </ul>
Add & subtract 3-digit numbers (split strategy)	1	Adding and subtracting two 3-digit numbers mentally using place value understanding (split strategy)	<ul style="list-style-type: none"> <li>• solve addition and subtraction problems using a split strategy, eg <math>265 + 327</math> as <math>200 + 300</math>, <math>60 + 20</math> and <math>5 + 7</math>, <math>500 + 80 + 12 = 592</math></li> <li>• record and explain the strategy using numerals, models and/or diagrams</li> <li>• check calculations using the inverse operation</li> </ul>

Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction

**Quest: Formal addition up to 3 digits**

Learning Journey	Steps	Content	Description
Adding numbers up to 3 digits (no exchanging)	1	Adding two 3-digit numbers using columnar addition, not crossing the 10 or 100	<ul style="list-style-type: none"> <li>• add two 3-digit numbers using columnar addition, not crossing the 10 or 100</li> </ul>
	2	Using a formal written algorithm for addition calculations up to three-digit numbers (no exchanging)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems without exchanging, with the same number of places and with a different number of places</li> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>

Learning Journey	Step	Content	Description
	3	Using a formal written algorithm and models for addition calculations of 2 three-digit numbers (no exchanging)	<ul style="list-style-type: none"><li>• add two 3-digit numbers using models, eg base 10, part-whole models, bar models</li></ul>
Adding numbers up to 3 digits (exchanging)	1	Using a formal written algorithm for addition calculations with three-digit and one-digit numbers (with exchanging)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems with exchanging; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li></ul>
			<ul style="list-style-type: none"><li>• use estimation or reverse operation to check the reasonableness of solutions</li></ul>
	2	Using a formal written algorithm for addition calculations with three-digit and two-digit numbers (with exchanging)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems with exchanging in 1 or more places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li></ul>
			<ul style="list-style-type: none"><li>• use estimation or reverse operation to check the reasonableness of solutions</li></ul>
	3	Using a formal written algorithm for addition calculations of two three-digit numbers (with exchanging)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems with exchanging in 1 or more places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li></ul>
			<ul style="list-style-type: none"><li>• use estimation or reverse operation to check the reasonableness of solutions</li></ul>
	4	Using a formal written algorithm for addition calculations up to three-digit numbers (with exchanging)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems with exchanging in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li></ul>
			<ul style="list-style-type: none"><li>• use estimation or reverse operation to check the reasonableness of solutions</li></ul>
Quest: Formal subtraction up to 3 digits			
Subtracting numbers up to 3-digits	1	Using a formal written algorithm to record subtraction calculations involving up to three-digit numbers (without decomposing)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems</li></ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>
Subtracting numbers up to 3 digits (decomposing)	1	Using a formal written algorithm to record subtraction calculations involving up to three-digit numbers (with decomposing)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems</li> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>

Estimate the answer to a calculation and use inverse operations to check answers			
Quest: Estimate calculations			
Learning Journey	Steps	Content	Description
Recognising and using inverse relationship	1	Recognising and using the inverse relationship between addition and subtraction	<ul style="list-style-type: none"> <li>• determine, through investigation, the inverse relationship between addition and subtraction</li> <li>• determine the missing number in addition and subtraction equations using a variety of tools and strategies, such as the inverse relationship between addition and subtraction (up to 2 digit with 2-digit addition or subtraction)</li> </ul>
Estimating answers to calculations	1	Estimating additions using rounding with 3-digit numbers	<ul style="list-style-type: none"> <li>• round numbers to the nearest multiple of 100 to estimate additions, eg <math>546 + 789</math> as <math>500 + 800</math></li> <li>• round numbers to the nearest multiple of 10 or 100 to estimate additions, eg <math>546 + 789</math> as <math>540 + 800</math></li> <li>• explain the reason for the estimation used and whether the estimation is higher or lower than the actual answer</li> </ul>
	2	Estimating subtractions using rounding with 3-digit number	<ul style="list-style-type: none"> <li>• round numbers to the nearest multiple of 100 to estimate subtractions, eg <math>546 - 189</math> as <math>500 - 200</math></li> <li>• round numbers to the nearest multiple of 10 or 100 to estimate subtractions, eg <math>746 - 389</math> as <math>740 - 400</math></li> <li>• explain the reason for the estimation used and whether the estimation is higher or lower than the actual answer</li> </ul>

Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction			
Quest: Solve problems: add and subtract			
Learning Journey	Steps	Content	Description
Problem solving with addition and subtraction	1	Creating and solving addition and subtraction word problems (within 1,000)	<ul style="list-style-type: none"> <li>• represent a word problem as an addition or subtraction number sentence</li> </ul>
			<ul style="list-style-type: none"> <li>• solve simple addition and subtraction word problems in context including find the difference, find the sum, change unknown, start unknown</li> </ul>
			<ul style="list-style-type: none"> <li>• explain and compare strategies used to solve addition and subtraction word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• create problems in contexts that involve addition and subtraction</li> </ul>
Comparing 3-digit and 2-digit number sentences	1	Comparing 3-digit and 2-digit number sentences (not crossing 100) using inequality symbols	<ul style="list-style-type: none"> <li>• compare number sentences using inequality symbols with addition, eg, <math>773 + 1</math> [<math>&lt;</math>, <math>&gt;</math>, <math>=</math>] <math>773 + 10</math></li> </ul>
			<ul style="list-style-type: none"> <li>• compare number sentences using inequality symbols with subtraction eg <math>773 - 1</math> [<math>&lt;</math>, <math>&gt;</math>, <math>=</math>] <math>773 - 10</math></li> </ul>
			<ul style="list-style-type: none"> <li>• compare number sentences using inequality symbols with subtraction and addition eg <math>773 - 1</math> [<math>&lt;</math>, <math>&gt;</math>, <math>=</math>] <math>773 + 10</math></li> </ul>
Describing addition and subtraction patterns	1	Describing patterns resulting from addition and subtraction involving at least one 3-digit number	<ul style="list-style-type: none"> <li>• describe patterns resulting from addition involving at least one 3-digit number, eg, explain what has happened to the starting number <math>240 + ? = 377</math></li> </ul>
			<ul style="list-style-type: none"> <li>• describe patterns resulting from subtraction involving at least one 3-digit number eg explain what has happened to the starting number</li> </ul>
Word problems - subtracting from 3-digit numbers	1	Solving word problems by subtracting a 1-digit number from a 3-digit number, exchange within 10	<ul style="list-style-type: none"> <li>• solve word problems by subtracting a 1-digit number from a 3-digit number, exchange within 10</li> </ul>
Quest: Solve problems: efficient methods			
Add 3-digit & 1-digit numbers (efficient addition)	1	Choosing efficient addition strategies when adding 2-digit and 3-digit numbers	<ul style="list-style-type: none"> <li>• solve 2-digit and 3-digit addition problems using efficient and effective strategies depending on the numbers in the problem, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies</li> </ul>
			<ul style="list-style-type: none"> <li>• record and explain the strategy using numerals, models and/or diagrams</li> </ul>
			<ul style="list-style-type: none"> <li>• check the solution using a different strategy; compare with own and others' strategies, discuss and compare the efficiency of strategies</li> </ul>

Learning Journey	Step	Content	Description
Subtract up to 3-digit numbers (efficient methods)	1	Choosing efficient subtraction strategies when subtracting 2-digit and 3-digit numbers	<ul style="list-style-type: none"> <li>• solve 2-digit and 3-digit subtraction problems using efficient and effective strategies depending on the numbers in the problem, eg use rounding and compensating, jump strategies, split strategies, place value strategies or bridging strategies</li> </ul>
			<ul style="list-style-type: none"> <li>• record and explain the strategy using numerals, models and/or diagrams</li> </ul>
			<ul style="list-style-type: none"> <li>• check the solution using a different strategy; compare with own and others' strategies, discuss and compare the efficiency of strategies</li> </ul>
	2	Subtracting 2 three-digit numbers using efficient methods with no exchange	<ul style="list-style-type: none"> <li>• subtract 2 three-digit numbers using bar models and number lines</li> </ul>
			<ul style="list-style-type: none"> <li>• subtract 2 three-digit numbers using base 10 representation</li> </ul>
			<ul style="list-style-type: none"> <li>• subtract 2 three-digit numbers using column method</li> </ul>
	3	Subtracting 2 three-digit numbers using efficient methods with no exchange (column method)	<ul style="list-style-type: none"> <li>• subtract 2 three-digit numbers using column method using visual representation of calculation, eg place value, bar model, number line</li> </ul>

### 1.3 Multiplication and division

Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables			
Quest: Multiply by 3			
Learning Journey	Steps	Content	Description
Exploring multiplication by 3	1	Exploring multiplication by 3	• relate multiplication by 3 to doubles and 1 more group; model and describe, eg '3 groups of 4 is the same as double 4 and one more group of 4'
			• explore patterns of the multiplication facts for 3 on a number chart
			• model the 2 related multiplication facts, eg $3 \times 4$ and $4 \times 3$
Recalling and using multiplication by 3	1	Recalling multiplication facts for 3 (up to $12 \times$ )	• recall the multiplication facts for 3
	2	Using multiplication facts for 3 (up to $12 \times$ )	• solve and create multiplication problems in context (using multiplication facts for 3), including word problems and models
Quest: Multiply by 4			
Exploring multiplication by 4	1	Exploring multiplication by 4 up to 48	• relate multiplication by 4 to double multiplication by 2
			• explore patterns of the multiplication facts for 4 on a number chart
			• model the 2 related multiplication facts, eg $3 \times 4$ and $4 \times 3$
Recalling and using multiplication by 4	1	Recalling multiplication facts for 4 (up to $12 \times$ )	• recall the multiplication facts for 4
	2	Using multiplication facts for 4	• solve and create multiplication problems in context (using multiplication facts for 4), including word problems
Quest: Multiply by 8			
Exploring multiplication by 8	1	Exploring multiplication by 8 up to 96	• use concrete materials, models, drawings, number lines/charts to skip count by 8 from zero; explore patterns of the multiplication facts for 8 on a number chart
			• relate multiplication by 8 to double multiplication by 4
Recalling and using multiplication facts for 8	1	Recalling and using multiplication facts for 8 (up to 96)	• recall the multiplication facts for 8 • solve multiplication problems with 8 including word problems
Quest: Divide by 3			
Exploring division by 3	1	Dividing by 3	• model and describe the related multiplication and division facts for 3 using models, drawings or manipulatives, eg $5 \times 3 = 15$ and 15 divided by 3 = 5 • relate division to how many (whole) times the divisor goes into the dividend
Recalling and using division facts for 3	1	Recalling division facts for 3 up to 36	• recall division facts for 3 up to 36



Learning Journey	Step	Content	Description
	2	Using division facts for 3 up to 36	<ul style="list-style-type: none"> <li>• solve and create division problems in context (using multiplication facts for 3), including word problems and models</li> </ul>
<b>Quest: Divide by 4</b>			
Exploring division by 4	1	Dividing by 4 up to 48	<ul style="list-style-type: none"> <li>• model and describe the related multiplication and division facts for 4 using models, drawings or manipulatives, eg <math>4 \times 3 = 12</math> and 12 divided by 3 = 4</li> <li>• relate division to how many (whole) times the divisor goes into the dividend</li> </ul>
Recalling and using division by 4	1	Recalling division facts for 4 up to 48	<ul style="list-style-type: none"> <li>• recall the division facts for 4 using models</li> </ul>
	2	Using division facts for 4 up to 48	<ul style="list-style-type: none"> <li>• solve and create division problems in context (using multiplication facts for 4), including word problems and models</li> </ul>
<b>Quest: Divide by 8</b>			
Exploring division by 8	1	Dividing by 8 up to 96	<ul style="list-style-type: none"> <li>• model and describe the related multiplication and division facts for 8 using models, drawings or manipulatives, eg <math>8 \times 3 = 24</math> and 24 divided by 3 = 8</li> <li>• relate division to how many (whole) times the divisor goes into the dividend</li> </ul>
Recalling and using division by 8	1	Recalling and using division facts for 8 up to 96	<ul style="list-style-type: none"> <li>• recall the division facts for 8</li> <li>• solve division problems with 8 including word problems</li> </ul>
<b>Quest: Multiply and divide by 3</b>			
Multiplying and dividing by 3	1	Multiplying and dividing by 3	<ul style="list-style-type: none"> <li>• recall the multiplication facts and related division facts for 3</li> <li>• solve multiplication and division problems with 3, including word problems</li> </ul>
<b>Quest: Multiply and divide by 4</b>			
Multiplying and dividing by 4	1	Multiplying and dividing by 4 up to 48	<ul style="list-style-type: none"> <li>• recall the multiplication facts and related division facts for 4</li> <li>• solve multiplication and division problems with 4, including word problems</li> </ul>
<b>Quest: Multiply and divide by 8</b>			
Multiplying and dividing by 8	1	Multiplying and dividing by 8 up to 96	<ul style="list-style-type: none"> <li>• recall the multiplication facts and related division facts for 8</li> <li>• solve multiplication and division problems with 8, including word problems</li> </ul>

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

**Quest: Multiply 2 digits by 1 digit**

Learning Journey	Steps	Content	Description
Multiplying 2 digits by 1 digit	1	Multiplying 2-digit numbers by 1-digit numbers using the contracted algorithm (no exchanging)	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, without exchanging</li> </ul>
	2	Multiplying 2-digit numbers by 1-digit numbers using the columnar contracted algorithm (2, 3, 4, 5, 8) no regrouping	<ul style="list-style-type: none"> <li>multiply 2-digit numbers by 1-digit numbers using the columnar contracted algorithm (2, 3, 4, 5, 8) no regrouping, eg multiply the ones, then the tens</li> </ul>
	3	Multiplying 2-digit numbers by 1-digit numbers using the contracted algorithm (with regrouping)	<ul style="list-style-type: none"> <li>multiply 2-digit numbers by 1-digit numbers using the contracted algorithm (with regrouping)</li> </ul>

**Quest: Divide 2 digits by 1 digit**

Dividing 2 digit by 1 digit	1	Dividing 2-digit numbers by a 1-digit number by partitioning (no exchange, no remainders)	<ul style="list-style-type: none"> <li>divide 2-digit numbers by a 1-digit number using partitioning and place value grids, part-whole models etc</li> </ul>
	2	Dividing 2-digit numbers by a 1-digit number by partitioning (with exchange, no remainders)	<ul style="list-style-type: none"> <li>divide 2-digit numbers by a 1-digit number using partitioning and place value grids, part whole models etc</li> </ul>
	3	Dividing 2-digit numbers by a 1-digit number by partitioning (with remainders)	<ul style="list-style-type: none"> <li>divide 2-digit numbers by a 1-digit number using partitioning and number lines, place value grids, part-whole models etc</li> </ul>

Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

**Quest: Solve problems: multiplication/division**

Learning Journey	Steps	Content	Description
Solving correspondence problems	1	Relating Cartesian products and multiplication	<ul style="list-style-type: none"> <li>use rectangular displays or tree diagrams to find the total number of combinations possible when given 2 characteristics, eg find the total number of possible outfits given 3 pants and 2 t-shirts</li> </ul>
			<ul style="list-style-type: none"> <li>relate multiplication to finding the total number of possible combinations</li> </ul>
Using the commutative property of multiplication	1	Using the commutative law of multiplication up to $12 \times 12$	<ul style="list-style-type: none"> <li>use the commutative law of multiplication, eg, <math>7 \times 12 = 12 \times 7</math></li> </ul>
Solving multiplication problems using equal groups	1	Solving multiplication problems using fair shares or equal grouping (within 100)	<ul style="list-style-type: none"> <li>solve fair share multiplication or division problems (with unknown in any position), eg '20 flowers are to be placed in 4 bunches, how many flowers will be in each bunch?'</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• solve equal grouping multiplication or division problems (with unknown in any position), eg 'There are 9 tables in a cafeteria. Each table has 5 chairs. What is the total number of chairs in the cafeteria?'</li> <li>• write equations using a symbol, eg a box or a blank, to represent the unknown number</li> <li>• compare their own and others' methods of solution</li> </ul>
Solving measurement and scaling problems	1	Using multiplication and division to solve measurement and scaling problems (within 100)	<ul style="list-style-type: none"> <li>• solve scaling problems using multiplication and division strategies, eg 'This square has sides of 5 cm. Draw a square with sides that are 3 times as long'</li> <li>• compare their own and others' methods of solution</li> </ul>
Using place value and related calculations	1	Using place value and related calculations to solve multiplication problems	<ul style="list-style-type: none"> <li>• use place value and related calculations to solve problems, eg, <math>6 \times 2 = 12</math>, <math>60 \times 2 = 120</math>. Because one number is ten times bigger, the answer will be ten times bigger</li> </ul>
Efficient strategies to solve division problems	1	Selecting efficient strategies to solve division problems	<ul style="list-style-type: none"> <li>• select and use a variety of mental and informal written strategies to solve division problems</li> <li>• apply the inverse relationship of multiplication and division to justify answers</li> <li>• check the answer to a word problem using digital technologies</li> <li>• record mental strategies accurately</li> </ul>

## 1.4 Fractions

Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10			
Quest: Count up and down in tenths			
Learning Journey	Steps	Content	Description
Introducing tenths	1	Introducing tenths	<ul style="list-style-type: none"> <li>• recognise that tenths come from 10 equal parts</li> <li>• find tenths of objects, sets and shapes</li> <li>• find the whole from the part</li> <li>• use language 'one tenth', 'two tenths' etc</li> <li>• use symbols to represent fractions <math>\frac{1}{10}</math>, <math>\frac{2}{10}</math> etc</li> <li>• recognise that tenths come from dividing 1-digit numbers or quantities by 10</li> </ul>
Counting in tenths	1	Counting in tenths	<ul style="list-style-type: none"> <li>• count up in tenths using proper fractions and mixed numbers (starting from any multiple of tenths), including on a number line</li> <li>• count down in tenths using proper fractions and mixed numbers (starting from any multiple of tenths), including on a number line</li> <li>• represent counting in tenths using number lines and models</li> </ul>
Ordering tenths	1	Ordering tenths (up to 1 whole)	<ul style="list-style-type: none"> <li>• order tenths in symbols and words</li> </ul>

Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators			
Quest: Recognise, find and write fractions			
Learning Journey	Steps	Content	Description
Recognising, finding and writing fractions	1	Matching fractions in different representations	<ul style="list-style-type: none"> <li>• match fractions using different representations, eg, written, model, fraction symbol, number line, multilink, Numicon</li> </ul>
Identifying a fraction of a set of objects	1	Identifying and representing simple fractions of an object or shape (denominators 1-12)	<ul style="list-style-type: none"> <li>• find any fraction, eg 5 squares shaded out of 12 is <math>\frac{5}{12}</math></li> <li>• recognise larger denominator = smaller parts</li> <li>• recognise that objects and shapes can be partitioned in various ways eg recognise that shading 5 squares out of 12 can be done in many ways</li> <li>• explore equivalences</li> </ul>

Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
Quest: Recognise and use fractions as numbers			
Learning Journey	Steps	Content	Description
Recognising and using fractions as numbers	1	Expressing whole numbers as fractions	<ul style="list-style-type: none"> <li>express whole numbers as fractions</li> </ul>

Recognise and show, using diagrams, equivalent fractions with small denominators			
Quest: Recognise and show equivalent fractions			
Learning Journey	Steps	Content	Description
Recognise fractions equivalent to 1	1	Identifying simple fractions that are equivalent to 1 whole	<ul style="list-style-type: none"> <li>use models to identify fractions that are equivalent to one whole</li> <li>record equivalences eg <math>\frac{3}{3} = 1</math></li> </ul>
Recognise equivalent fractions less than 1	1	Investigating simple equivalent fractions less than 1 using concrete materials and/or models (denominators 2, 3, 4, 5, 6, 8, 10)	<ul style="list-style-type: none"> <li>use models such as number lines, bar models to identify equivalent fractions</li> <li>use concrete materials or models to show equivalent fractions, eg, folding a strip of paper</li> </ul>
	2	Finding simple equivalent proper fractions (denominators 2, 3, 4, 5, 6, 8, 10)	<ul style="list-style-type: none"> <li>recognise and show, using diagrams simple equivalent fractions with small denominators — eg <math>\frac{4}{8}</math> and <math>\frac{1}{2}</math></li> </ul>
	3	Finding simple equivalent proper fractions (denominators 2, 3, 4, 6, 8)	<ul style="list-style-type: none"> <li>recognise and generate simple equivalent fractions (denominators 2, 3, 4, 6, 8)</li> <li>explain why the fractions are equivalent by using a visual fraction model</li> </ul>

Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ]			
Quest: Add fractions up to 1 whole			
Learning Journey	Steps	Content	Description
Adding unit fractions with the same denominator	1	Adding unit fractions with the same denominators (2, 4, 8) to make fractions up to and including 1 whole (with models)	<ul style="list-style-type: none"> <li>add unit fractions with the same denominator (2, 4, 8) to make fractions up to and including 1 whole using models</li> <li>solve problems involving adding fractions with the same denominator (2, 4, 8)</li> </ul>
	2	Adding unit fractions with the same denominator (2, 4, 8) to make fractions up to and including 1 whole (without models)	<ul style="list-style-type: none"> <li>add unit fractions with the same denominator (2, 4, 8) to make fractions up to and including 1 whole without models</li> <li>solve unit fraction problems where the parts are unknown, eg <math>\frac{1}{4}</math> plus missing fraction equals 1 whole</li> </ul>
Adding proper fractions with the same denominator	1	Adding proper fractions with the same denominator using models to make fractions up to 1 whole	<ul style="list-style-type: none"> <li>add 2 or more fractions with the same denominator up to one whole (with and without models)</li> </ul>

Learning Journey	Step	Content	Description
<b>Quest: Subtract fractions within 1 whole</b>			
Subtracting unit fractions with same denominator	1	Subtracting unit fractions with the same denominator (2, 4, 8) including subtracting from 1 whole (with models)	<ul style="list-style-type: none"> <li>subtract unit fractions with the same denominator (2, 4, 8) up to 1 whole with the use of models</li> <li>solve problems involving subtracting unit fractions with the same denominator (2, 4, 8) from 1 whole</li> </ul>
	2	Subtracting unit fractions with the same denominator (2, 4, 8) including subtracting from 1 whole (without models)	<ul style="list-style-type: none"> <li>subtract unit fractions with the same denominator (2, 4, 8) up to 1 whole without the use of models</li> <li>solve unit fraction problems where the parts are unknown, eg 1 whole minus missing fraction equals <math>\frac{1}{4}</math></li> </ul>
Subtracting proper fractions with same denominator	1	Subtracting proper fractions with the same denominator using models to make fractions within 1 whole	<ul style="list-style-type: none"> <li>subtract 2 or more fractions with the same denominator up to one whole (with and without models)</li> </ul>
	2	Subtracting simple fractions with the same denominator using models, including subtracting from 1 whole	<ul style="list-style-type: none"> <li>use models to subtract 2 or more fractions with the same denominator (including subtracting from one whole)</li> <li>solve problems involving adding fractions with the same denominator</li> </ul>
<b>Quest: Add &amp; subtract fractions within 1 whole</b>			
Adding & subtracting fractions (same denominator)	1	Adding and subtracting simple fractions with the same denominator using models to make fractions up to and including one whole	<ul style="list-style-type: none"> <li>use models to add or subtract 2 or more fractions with the same denominator</li> <li>solve problems involving adding or subtracting fractions with the same denominator</li> </ul>

Compare and order unit fractions, and fractions with the same denominators			
<b>Quest: Compare and order simple fractions</b>			
Learning Journey	Steps	Content	Description
Comparing and ordering fractions	1	Ordering and comparing simple proper fractions with different denominators using models as a scaffold (denominators 2, 3, 4, 5, 6, 7, 8)	<ul style="list-style-type: none"> <li>order fractions with different denominators, including on a number line marked with 0, <math>\frac{1}{2}</math>, 1; use models to support decisions</li> </ul>
			<ul style="list-style-type: none"> <li>compare fractions using models and <math>\frac{1}{2}</math> as a reference, eg <math>\frac{3}{8}</math> and <math>\frac{6}{7}</math>, '<math>\frac{3}{8}</math> is closer to one half and <math>\frac{6}{7}</math> is closer to one whole so <math>\frac{6}{7}</math> is larger'</li> </ul>

Solve problems that involve all of the above			
<b>Quest: Solve problems: fractions</b>			
Learning Journey	Steps	Content	Description
Estimating/adding to find fractions of sets	1	Using estimation and addition strategies to find simple unit fractions of sets (denominators 2, 3, 4, 5, 6, 8)	<ul style="list-style-type: none"> <li>estimate the value of a given unit fraction of a set or quantity; check using repeated addition</li> </ul>
			<ul style="list-style-type: none"> <li>use trial and improvement with repeated addition and grouping, eg <math>\frac{1}{3}</math> of 18 ... as <math>5 + 5 + 5 = 15</math> so let's try <math>6 + 6 + 6 = 18</math></li> </ul>

Learning Journey	Step	Content	Description
	2	Using estimation and addition strategies to find simple proper fractions of sets (denominators 2, 3, 4, 5, 6, 8)	<ul style="list-style-type: none"> <li>• estimate the value of a given proper fraction of a set or quantity; check using repeated addition</li> <li>• use trial and improvement with repeated addition and equal sharing, eg <math>\frac{2}{3}</math> of 18 ... as <math>5 + 5 + 5 = 15</math> so let's try <math>6 + 6 + 6 = 18</math> so <math>\frac{2}{3}</math> is <math>6 + 6</math></li> <li>• explore equivalence between halves, quarters, eighths and thirds and sixths</li> </ul>
Finding the whole amount	1	Using models to find the whole given the unit fraction of a set (denominators 2, 3, 4, 5, 6, 8)	<ul style="list-style-type: none"> <li>• find the whole given the fraction of a set, eg Anne has 4 stickers. She has <math>\frac{1}{3}</math> of the sticker collection. How many stickers are there in the sticker collection?</li> <li>• use addition and subtraction strategies</li> </ul>
Finding the fraction of an amount	1	Finding the fraction of an amount by dividing into equal groups with models, within 100 (denominators up to 10)	<ul style="list-style-type: none"> <li>• find the unit fraction of an amount by dividing an amount into equal groups</li> <li>• find the proper fraction of an amount by dividing an amount into equal groups</li> </ul>

## 2 Measurement

### 2.1 Measurement

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)			
Quest: Length: measure, compare, add & subtract			
Learning Journey	Steps	Content	Description
Introducing formal units for millimetres	1	Introducing formal units for length: millimetres	<ul style="list-style-type: none"> <li>• recognise the need for a formal unit smaller than the centimetre to measure length</li> </ul>
			<ul style="list-style-type: none"> <li>• develop a personal reference for the approximate length of 1 mm</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise and model that there are 10 mm in 1 cm, ie <math>10\text{ mm} = 1\text{ cm}</math></li> </ul>
			<ul style="list-style-type: none"> <li>• estimate and use the millimetre as a unit to measure lengths to the nearest millimetre using a ruler</li> </ul>
			<ul style="list-style-type: none"> <li>• record lengths using the abbreviation for millimetres (mm), eg 5 cm 3 mm or 53 mm</li> </ul>
			<ul style="list-style-type: none"> <li>• compare lengths with the same standard unit</li> </ul>
Measuring length in metres and centimetres	1	Measuring in metres and centimetres	<ul style="list-style-type: none"> <li>• estimate and measure lengths and distances using metres and centimetres</li> </ul>
			<ul style="list-style-type: none"> <li>• explain strategies used to estimate lengths and distances, such as by referring to a known length, eg 'My handspan is 10 cm and my desk is 8 handspans long, so my desk is about 80 cm long'</li> </ul>
			<ul style="list-style-type: none"> <li>• record lengths and distances using abbreviations for metres and centimetres, eg 1 m 25 cm</li> </ul>
Selecting appropriate units of measurement	1	Selecting appropriate units of measurement: metres, centimetres, millimetres	<ul style="list-style-type: none"> <li>• explore the appropriateness of units when measuring length</li> </ul>
			<ul style="list-style-type: none"> <li>• select and justify the most appropriate metric unit to measure given lengths and distances</li> </ul>
Comparing: length	1	Comparing lengths in metres and centimetres	<ul style="list-style-type: none"> <li>• compare lengths and distances using metres and centimetres</li> </ul>
	2	Comparing lengths in millimetres and centimetres	<ul style="list-style-type: none"> <li>• compare lengths and distances using millimetres and centimetres</li> </ul>
	3	Comparing lengths of mixed units	<ul style="list-style-type: none"> <li>• measure and compare lengths of mixed units, eg 1 m 45 cm</li> </ul>
Ordering: length	1	Ordering lengths in metres and centimetres	<ul style="list-style-type: none"> <li>• order lengths and distances using metres and centimetres</li> </ul>
	2	Ordering lengths in millimetres and centimetres	<ul style="list-style-type: none"> <li>• compare lengths and distances using millimetres and centimetres</li> </ul>
Adding and subtracting: length	1	Adding and subtracting lengths	<ul style="list-style-type: none"> <li>• add and subtract lengths of a single unit</li> </ul>
	2	Adding and subtracting lengths of mixed units	<ul style="list-style-type: none"> <li>• add and subtract lengths of mixed units, eg <math>1\text{ m }45\text{ cm} + 2\text{ m }15\text{ cm}</math></li> </ul>



Learning Journey	Step	Content	Description
<b>Quest: Mass: measure, compare, add &amp; subtract</b>			
Measuring mass in kg & g	1	Measuring mass in kilograms	• compare and order 2 or more objects by mass measured to the nearest kilogram using carried scales
			• estimate the number of objects that have a total mass of 1 kilogram and check by measuring
			• estimate mass using a personal reference for a kilogram
			• record mass using the abbreviation 'kg'
			• compare masses using uniform informal units and the symbols >, =, <
			• compare masses using simple scaling by integers, eg 'five times as heavy'
	2	Measuring in grams	• estimate mass using personal references for grams and 'guess and check'
			• measure mass in grams by using and interpreting varied scales and images of scales
			• record mass in grams using the appropriate abbreviation (g)
	3	Measuring in grams and kilograms	• estimate mass using personal references for grams and kilograms
			• choose appropriate standard units to estimate and measure (g/kg)
			• measure mass in grams and kilograms by using and interpreting varied scales
			• record mass in grams, kilograms and mixed units using the appropriate abbreviations (g), (kg), eg 5 kg and 500 g
Comparing and ordering: mass	1	Comparing and ordering masses using standard metric units	• measure mass by using and interpreting varied scales
			• compare and order masses using grams and kilograms and justify comparisons
			• represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale
			• compare masses using uniform informal units and the symbols >, =, <
Adding and subtracting: mass	1	Solving addition and subtraction problems involving masses of the same unit	• solve addition and subtraction problems involving masses of the same unit

Learning Journey	Step	Content	Description
<b>Quest: Volume: measure, compare, add &amp; subtract</b>			
Measuring volume in litres and millilitres	1	Introducing formal units for volume and capacity: litres	<ul style="list-style-type: none"> <li>• recognise and explain the need for formal units to measure volume and capacity</li> </ul>
			<ul style="list-style-type: none"> <li>• develop a personal reference for one litre and fractions of 1 litre (quarters and halves); relate the litre to familiar everyday containers, eg milk cartons</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that one-litre containers can be a variety of shapes</li> </ul>
			<ul style="list-style-type: none"> <li>• record volumes and capacities using the abbreviation for litres (l)</li> </ul>
	2	Introducing formal units for volume and capacity: millilitres	<ul style="list-style-type: none"> <li>• recognise the need for a formal unit smaller than the litre to measure volume and capacity</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that there are 1,000 millilitres in 1 litre, ie 1,000 millilitres = 1 litre</li> </ul>
			<ul style="list-style-type: none"> <li>• relate the millilitre to familiar everyday containers and familiar informal units, eg, 250 ml fruit juice containers, 1 teaspoon is approximately 5 ml</li> </ul>
	3	Reading scales with 100 millilitre markings	<ul style="list-style-type: none"> <li>• read a scale where every 100 ml is marked and labelled</li> </ul>
			<ul style="list-style-type: none"> <li>• read a scale where every 100 ml is marked and half and 1 litre are labelled</li> </ul>
			<ul style="list-style-type: none"> <li>• read a scale where every 100 ml is marked and every other 100 ml is labelled</li> </ul>
Comparing and ordering: units of volume	1	Comparing and ordering mixed units of volume (l and ml)	<ul style="list-style-type: none"> <li>• compare and order 2 or more containers by capacity measured in litres, including the capacity of commercially packaged objects whose capacity is stated in litres and millilitres using inequality symbols (&lt;, &gt; or =)</li> </ul>
Adding and subtracting: volume	1	Adding and subtracting litres or millilitres	<ul style="list-style-type: none"> <li>• add and subtract litre measurements</li> <li>• add and subtract millilitre measurements</li> </ul>
	2	Adding and subtracting litres and millilitres	<ul style="list-style-type: none"> <li>• add and subtract measurements in litres and millilitres eg 5 l and 300 ml + 3 l and 200 ml</li> </ul>

Measure the perimeter of simple 2-D shapes			
<b>Quest: Measure perimeter of 2-D shapes</b>			
Learning Journey	Steps	Content	Description
Measuring perimeter in cm	1	Measuring perimeter in centimetres	<ul style="list-style-type: none"> <li>• calculate the perimeter of 2D shapes placed on centimetre squares</li> </ul>

Learning Journey	Step	Content	Description
	2	Calculating the perimeter of a regular shape in centimetres	<ul style="list-style-type: none"> <li>• calculate the perimeter of a regular shape in centimetres using mental strategies such as repeated addition where all lengths are shown</li> <li>• calculate the perimeter of a regular shape in cm using mental strategies such as repeated addition where one or more lengths are missing</li> </ul>

Add and subtract amounts of money to give change, using both £ and p in practical contexts			
Quest: Add and subtract amounts of money			
Learning Journey	Steps	Content	Description
Adding and subtracting amounts of money	1	Adding 2 amounts of money using pictorial representation, partitioning and models (no decimals)	<ul style="list-style-type: none"> <li>• add 2 amounts of money using pictorial representation, partitioning and models eg part-whole model and bar models (no decimals)</li> <li>• subtract 2 amounts of money using a jump strategy and number lines to calculate the difference between the 2 amounts (no decimals)</li> </ul>
	2	Calculating change using models (no decimals)	<ul style="list-style-type: none"> <li>• calculate change and select the correct coins using part-whole models and number lines</li> </ul>
	3	Using money to make purchases	<ul style="list-style-type: none"> <li>• calculate the total cost of purchasing 2 items given their values and record the value in pounds and pence separately (no decimal point)</li> <li>• determine the exact notes and coins needed to purchase 2 items given their values</li> </ul>

Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks			
Quest: Tell the time: analogue clock			
Learning Journey	Steps	Content	Description
Telling the time to 5 minutes on analogue clocks	1	Telling time to five minutes (analogue)	<ul style="list-style-type: none"> <li>• observe and describe the movement of the minute hand as time passes, including the time it takes for the minute hand to move from one numeral to the next and the time it takes for the minute hand to complete one revolution</li> <li>• observe and describe the movement of the hour hand as time passes, including the time it takes for the hour hand to move from 1 numeral to the next and the time it takes for the hour hand to complete 1 revolution</li> <li>• read time on analogue clocks to 5 minutes using the terms 'o'clock', 'past' and 'to', including 'half past', 'quarter past' and 'quarter to' and write in words</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• position or draw the hands on an analogue clock to show time to 5 minutes where the time is given using the terms 'o'clock', 'past' and 'to', including 'half past', 'quarter past' and 'quarter to'</li> </ul>
Telling the time to the minute on analogue clocks	1	Telling time to the minute (analogue)	<ul style="list-style-type: none"> <li>• read time on analogue clocks to the minute using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to'</li> <li>• observe and describe the position or draw the hands of an analogue clock when reading time to the minute, including the hour hand, minute hand and second hand</li> <li>• position or draw the hands on an analogue clock to show time to the minute where the time is given using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to'</li> </ul>
<b>Quest: Tell the time: Roman numerals</b>			
Telling the time and Roman numerals	1	Telling the time five minutes using Roman Numeral clocks	<ul style="list-style-type: none"> <li>• observe and describe the movement of the minute hand as time passes, including the time it takes for the minute hand to move from 1 numeral to the next and the time it takes for the minute hand to complete 1 revolution</li> </ul>
	2	Telling time to the minute (Roman numeral clocks)	<ul style="list-style-type: none"> <li>• read time on analogue clocks with Roman numerals to the minute using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to'</li> <li>• record times on analogue clocks with Roman numerals to the minute in 12-hour digital format</li> <li>• observe and describe the position or draw the hands of an analogue clock with Roman numerals when reading time to the minute, including the hour hand, minute hand and second hand</li> <li>• position or draw the hands on an analogue clock with Roman numerals to show time to the minute where the time is given using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to'</li> <li>• position or draw the hands on an analogue clock with Roman numerals to show time to the minute where the time is given in 12-hour digital format</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>connect 12-hour digital displays for times, to the minute, to their corresponding display on an analogue clock with Roman numerals</li> </ul>
<b>Quest: Tell the time: 12- and 24-hour clock</b>			
Telling the time in 12- and 24-hour clock	1	Matching 24-hour notation to 12-hour notation	<ul style="list-style-type: none"> <li>convert between 24-hour time notation and 12-hour time notation</li> </ul>

Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight			
<b>Quest: Estimate and read time</b>			
Learning Journey	Steps	Content	Description
Comparing and ordering time in seconds and minutes	1	Comparing and ordering time in terms of seconds and minutes	<ul style="list-style-type: none"> <li>order time in terms of seconds and minutes</li> <li>compare time in terms of seconds and minutes using &lt;, &gt; or =</li> </ul>
<b>Quest: Use time vocabulary: a.m. and p.m.</b>			
Using a.m. and p.m. notation	1	Using am and pm notation	<ul style="list-style-type: none"> <li>know that there are 24 hours in a day</li> <li>recognise that midday/noon divides the day into two equal parts of 12 hours each</li> <li>establish the need to distinguish between times in the first 12 hours of the day and the second 12 hours of the day, and introduce am and pm notation</li> <li>know and record midday/noon as 12pm and 12:00pm, and midnight as 12am and 12:00am</li> <li>use am and pm notation to record times in relation to midday/noon and midnight</li> <li>read times written using am and pm notation using 'past', 'to', morning, afternoon, evening and night appropriately', eg 3:40 pm is 'twenty to four in the afternoon'</li> </ul>

Know the number of seconds in a minute and the number of days in each month, year and leap year			
<b>Quest: Relationships between units of time</b>			
Learning Journey	Steps	Content	Description
Recalling relationships between units of time	1	Recalling relationships between units of time	<ul style="list-style-type: none"> <li>know and recall that 1 hour = 60 minutes, 1 minute = 60 seconds</li> <li>know and recall that 1 day = 24 hours</li> <li>know and recall that 1 year = 365 days and that 1 leap year = 366 days and relate this to the rotation of the earth</li> <li>know and recall that 1 week = 7 days, 1 fortnight = 2 weeks</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• solve problems relate to the relationship between units of time</li> </ul>
Using calendars to solve problems: months & years	1	Using calendars to solve problems	<ul style="list-style-type: none"> <li>• locate any given date, including today's date, on a calendar</li> <li>• use a calendar to locate the date to match a given description, eg if today is Monday 8th April, then what is the date on Thursday?; find the date of the third Thursday in March</li> <li>• use a calendar to determine the number of days, weeks or months until a future event or between events</li> <li>• use a calendar to calculate and describe lengths of time in days/weeks</li> </ul>
Using calendars to solve problems: hours & days	1	Introducing formal units for time: hours	<ul style="list-style-type: none"> <li>• establish the need for formal units (hours) to measure time</li> <li>• identify situations where hours are an appropriate unit for measuring the duration of time</li> <li>• identify the relationship between half hours and hours</li> <li>• know that there are 24 hours in one day</li> <li>• introduce the abbreviation h to record time in hours</li> <li>• compare durations in hours</li> </ul>

Compare durations of events [for example, to calculate the time taken by particular events or tasks]			
Quest: Compare durations of events			
Learning Journey	Steps	Content	Description
Comparing durations in hours, minutes and seconds	1	Comparing durations in hours, minutes and seconds	<ul style="list-style-type: none"> <li>• compare and sequence durations given in a combination hours, minutes and seconds</li> <li>• measure and compare time intervals in mixed units (h, min, s)</li> </ul>
Calculating elapsed time	1	Calculating elapsed time within one unit of measurement	<ul style="list-style-type: none"> <li>• estimate and determine elapsed time in hours only</li> <li>• estimate and determine elapsed time in minutes only, without crossing an hour</li> <li>• estimate and determine elapsed time in minutes only, including crossing an hour</li> </ul>
Calculating start and end times	1	Calculating start and end times (12 and 24 hour)	<ul style="list-style-type: none"> <li>• calculate the end time of events using start and elapsed times using models and tables</li> <li>• calculate the start time of events using elapsed and finishing times using models and tables</li> </ul>

### 3 Geometry

#### 3.1 Properties of shape

Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them			
Quest: Compare and describe 2-D shapes			
Learning Journey	Steps	Content	Description
Comparing and describing 2-D shapes	1	Comparing and describing 2D shapes, including special quadrilaterals	• identify and name a shape given a description of its features
			• sort 2D shapes using given attributes, eg, number of sides, number of parallel sides
			• compare similarities and differences between 2D shapes, including the special quadrilaterals+D159
Quest: Recognise 3-D shapes			
Making models of 3-D shapes	1	Making basic models of 3D shapes	• use a variety of materials to make models of prisms (including cubes), pyramids, cylinders, cones and spheres, given a 3D shape, picture or photograph to view
			• identify and describe the 2D shapes that can be found in a 3D shape, eg, build a structure using concrete materials and describe it using geometric terms so that a partner will be able to build it
Comparing, sorting and naming 3-D shapes	1	Comparing, sorting and naming prisms and pyramids	• compare and sort prisms and pyramids by their geometric properties, eg number of edges, number of vertices
			• describe and name prisms and pyramids by the shape of their base
	2	Comparing 3D shapes including pyramids, prisms, cones, spheres and cylinders	• describe similarities and differences between prisms (including cubes), pyramids, cylinders, cones and spheres, eg, surfaces, faces, edges and vertices
			• recognise and describe the use of 3D shapes in a variety of contexts, eg, buildings, packaging
			• identify and name 3D shapes as prisms (including cubes), pyramids, cylinders, cones and spheres

Recognise angles as a property of shape or a description of a turn			
Quest: Recognise turns and angles			
Learning Journey	Steps	Content	Description
Recognising turns and angles	1	Recognising angles as a description of a turn	<ul style="list-style-type: none"> <li>• recognise angles as a measure of a turn (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{3}{4}</math>) and use appropriate language to describe the rotation such as quarter turn, half turn, clockwise and anticlockwise</li> </ul>

Identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle			
Quest: Identify right angles			
Learning Journey	Steps	Content	Description
Identifying right angles in shapes	1	Introducing right angles	• identify right angles on 2D shapes and 3D shapes
			• identify right angles in pictures, designs and the environment
			• identify right angles in line diagrams
			• use and interpret the symbol $\perp$ in diagrams to represent a right angle
			• define perpendicular lines and identify them in pictures, designs and the environment
			• recognise that a pair of perpendicular lines form 4 right angles
Comparing angles	1	Classifying angles in relation to a right angle	• classify angles as 'less than a right angle', 'about the same as a right angle', 'greater than a right angle'

Identify horizontal and vertical lines and pairs of perpendicular and parallel lines			
Quest: Identify horizontal and vertical lines			
Learning Journey	Steps	Content	Description
Identifying horizontal and vertical lines	1	Identifying horizontal and vertical lines on shapes and objects	• identify horizontal and vertical lines on shapes and objects, eg, alphabet letters, numbers, shapes and environmental shapes
	2	Sorting horizontal and vertical lines on shapes and objects	• sort objects in a table based on properties
Quest: Identify parallel & perpendicular lines			
Identifying parallel and perpendicular lines	1	Classifying plane shapes by their spatial features	• classify plane shapes by the nature and number of sides, angles and symmetry; including parallel/perpendicular sides, right, obtuse, acute angles
	2	Identifying parallel sides in quadrilaterals	• manipulate and compare the special quadrilaterals; identify parallel sides • identify and sort quadrilaterals by their number of parallel lines (if any)



## 4 Statistics

### 4.1 Statistics

Interpret and present data using bar charts, pictograms and tables			
Quest: Interpret and present data: bar charts			
Learning Journey	Steps	Content	Description
Interpreting data in bar charts	1	Reading and interpreting grouped and/or ordered data in a bar chart with one-to-one correspondence	• become familiar with grouped/or-dered data in a bar chart
			• ask and answer questions related to grouped or ordered data in a bar chart
Quest: Interpret and present data: pictograms			
Interpreting data in pic-tograms	1	Reading data in a pictogram with a scale of 1, 2, 5, or 10	• ask and answer one step and two step questions, eg, 'how many more students like reading than art?'
			• make conclusions about data pre-sented in a bar chart, eg, 'Football is the most popular sport for students in Year 3 at our school'
			• compare bar charts with pic-tograms
			• evaluate simple statements made by others relating to data in a pic-togram
	2	Representing data in a pictogram with a scale of 1, 2, 5 or 10	• construct vertical and horizontal pictograms with equal spacing
			• choose an appropriate title and la-bel the axis
			• choose an appropriate picture or symbol for a pictogram and state the key used (1, 2, 5 or 10)
			• solve comparison, sum and differ-ence (one-step and two-step prob-lems) problems related to the data display; make conclusions
Quest: Interpret and present data: tables			
Interpreting data in ta-bles	1	Representing and reading cate-gory data in a table	• represent primary or secondary data in a given table using appropri-ate headings and layout
			• interpret data in a table; ask and answer summative and comparative questions
	2	Reading and interpreting tables and bar charts/graphs (block style)	• read data from tables and bar charts/graphs
			• interpret data from tables and bar charts/graphs
		• draw conclusions related to the data in the display	

Solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

**Quest: Solve problems related to data displays**

Learning Journey	Steps	Content	Description
Using data in tables and pictograms	1	Collecting, recording and interpreting data in tables and pictograms	• choose effective ways to collect and record data in a table
			• read and interpret data in tables
			• choose effective ways to collect and record data using pictograms
			• read and interpret data in pictograms

## Part II

# Year 4

## 5 Number

### 5.1 Number and place value

Count in multiples of 6, 7, 9, 25 and 1,000			
Quest: Count in multiples (6, 7, 9, 25 & 1,000)			
Learning Journey	Steps	Content	Description
Counting in multiples of 6	1	Counting in multiples of 6 to 72	<ul style="list-style-type: none"> <li>count in multiples of 6</li> </ul>
Counting in multiples of 7	1	Counting in multiples of 7 to 84	<ul style="list-style-type: none"> <li>count in multiples of 7</li> </ul>
Counting in multiples of 9	1	Counting in multiples of 9 to 108	<ul style="list-style-type: none"> <li>count in multiples of 9</li> </ul>
Counting in multiples of 25	1	Counting by skip counting forwards by 25s from any multiple of 25 up to 10,000	<ul style="list-style-type: none"> <li>use concrete materials, models, drawings, number lines/charts to skip count by 25s from any multiple of 25</li> </ul>
			<ul style="list-style-type: none"> <li>use knowledge of the number sequence to count in 25s from any multiple of 25</li> </ul>
			<ul style="list-style-type: none"> <li>recognise an error in the skip counting sequence</li> </ul>
	2	Counting by skip counting backwards by 25s from any multiple of 25 from 10,000	<ul style="list-style-type: none"> <li>use concrete materials, models, drawings, number lines/charts to skip count backwards by 25s</li> </ul>
			<ul style="list-style-type: none"> <li>use knowledge of the number sequence to count backwards in 25s from any multiple of 25</li> </ul>
			<ul style="list-style-type: none"> <li>recognise an error in the skip counting sequence</li> </ul>
Counting in multiples of 1,000	3	Counting by skip counting forwards or backwards by 25s from any multiple of 25 from zero to 10,000	<ul style="list-style-type: none"> <li>use concrete materials, models, drawings, number lines/charts to skip count by 25s</li> </ul>
			<ul style="list-style-type: none"> <li>use knowledge of the number sequence to count forwards or backwards in 25s from any multiple of 25</li> </ul>
			<ul style="list-style-type: none"> <li>recognise an error in the skip counting sequence</li> </ul>
Counting in multiples of 1,000	1	Counting by skip counting forwards or backwards by 1,000s to 10,000	<ul style="list-style-type: none"> <li>use Base 10, models, drawings, number lines/charts to skip count forwards or backwards by 1,000s from zero to 10,000</li> </ul>
			<ul style="list-style-type: none"> <li>recognise an error in the skip counting sequence</li> </ul>
Counting in multiples of 6, 7, 9, 25 and 1,000	1	Counting in multiples of 6, 7, 9, 25 and 1,000	<ul style="list-style-type: none"> <li>count in multiples of 6, 7, 9, 25 and 1,000</li> </ul>

Find 1,000 more or less than a given number			
Quest: Find 1,000 more/less than a given number			
Learning Journey	Steps	Content	Description
Finding 1,000 more or less than a given number	1	Finding the number 1,000 more or 1,000 less than a given number	<ul style="list-style-type: none"> <li>• apply an understanding of place value to find the number 1,000 more or 1,000 less</li> </ul>

Count backwards through zero to include negative numbers			
Quest: Count using negative numbers			
Learning Journey	Steps	Content	Description
Counting using negative numbers	1	Introducing negative integers	<ul style="list-style-type: none"> <li>• count backwards through 0 to include negative numbers</li> </ul>
		Investigating integers in context	<ul style="list-style-type: none"> <li>• count forwards and backwards with positive and negative whole numbers, including through 0 (in context)</li> </ul>

Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)			
Quest: Recognise place value in 4-digit numbers			
Learning Journey	Steps	Content	Description
Recognising the place value of 4-digit numbers	1	Identifying the place value of digits in 4-digit numbers	<ul style="list-style-type: none"> <li>• write the numeral for a 4-digit number modelled using place value equipment</li> </ul>
			<ul style="list-style-type: none"> <li>• identify the digit in the thousands, hundreds, tens or ones column for a given 4-digit number</li> </ul>
			<ul style="list-style-type: none"> <li>• identify, record and model a number using place value clues, eg 'an 8 in the thousands, 5 in the hundreds and a 2 in the ones' as 8502</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise the role of zero as a placeholder</li> </ul>
			<ul style="list-style-type: none"> <li>• create the smallest and largest numbers possible using 4 digits</li> </ul>

Order and compare numbers beyond 1,000			
Quest: Order and compare numbers beyond 1,000			
Learning Journey	Steps	Content	Description
Ordering numbers beyond 1,000	1	Ordering numbers to 10,000	<ul style="list-style-type: none"> <li>• order up to 4 consecutive 2-digit, 3-digit or 4-digit numbers within 10,000 in ascending order or descending order; explain the reason for the order given</li> <li>• order up to 4 non-consecutive 2-digit, 3-digit or 4-digit numbers within 1,000 in ascending or descending order; explain the reason for the order given using place value reasoning</li> </ul>
	2	Ordering numbers up to and including 5 digits	<ul style="list-style-type: none"> <li>• arrange numbers of up to and including 5 digits in ascending and descending order</li> </ul>

Learning Journey	Step	Content	Description
Comparing numbers beyond 1,000	1	Comparing numbers to 10,000 using models and inequality symbols	<ul style="list-style-type: none"> <li>model and compare two 4-digit numbers using place value equipment</li> </ul>
			<ul style="list-style-type: none"> <li>compare two numbers of up to 4 digits and describe using the terms and symbols: greater than (&gt;) or less than (&lt;); explain the comparison using place value reasoning</li> </ul>

Identify, represent and estimate numbers using different representations			
Quest: Identify and represent numbers			
Learning Journey	Steps	Content	Description
Identifying up to 4-digit numbers	1	Identifying numbers before and after up to 4-digit numbers (within 10,000)	<ul style="list-style-type: none"> <li>identify the number that comes before a given 2-, 3- or 4-digit number up to 10,000; describe this number as 'one more than'</li> </ul>
			<ul style="list-style-type: none"> <li>identify the number that comes after a given 2-, 3- or 4-digit number up to 10,000; describe this number as 'one less than'</li> </ul>
			<ul style="list-style-type: none"> <li>identify the number that comes before or after a given 2-, 3- or 4-digit number up to 10,000; describe this number as 'one more than' or 'one less than'</li> </ul>
Representing 4-digit numbers in numerals and words	1	Reading and writing 4-digit numbers using words and numerals	<ul style="list-style-type: none"> <li>write a given 4-digit number in words, eg 4567 as four thousand, four hundred and sixty-seven</li> <li>write the numerals for a 4-digit number given in words</li> </ul>
	2	Representing 4-digit numbers using words, numerals and objects	<ul style="list-style-type: none"> <li>model a given 4-digit number using concrete materials, pictures or drawings</li> <li>write the numerals in words, eg 'seven thousand, three hundred and fifty-three' for a 4-digit number represented using place value equipment or using pictures, drawings</li> </ul>
Partitioning 4-digit numbers	1	Using place value to partition 4-digit numbers	<ul style="list-style-type: none"> <li>use place value equipment to partition a given 4-digit number into thousands, hundreds, tens and ones</li> </ul>
			<ul style="list-style-type: none"> <li>describe a 4-digit number using words, eg, 9,523 as '9 thousands, 5 hundreds, 2 tens and 3 ones'</li> </ul>
			<ul style="list-style-type: none"> <li>write a 4-digit number in expanded notation, eg, 7,523 as <math>7,000 + 500 + 20 + 3</math></li> </ul>
			<ul style="list-style-type: none"> <li>write the numeral for a number represented by expanded notation</li> <li>recognise zero as a placeholder</li> </ul>

Learning Journey	Step	Content	Description
	2	Partitioning 4-digit numbers using non-standard partitioning	<ul style="list-style-type: none"> <li>• use place value equipment to partition a given 4-digit number using non-standard partitioning, eg, 2,375 as 2 thousands, 1 hundred and 275 ones or <math>2,000 + 100 + 275</math></li> </ul>
			<ul style="list-style-type: none"> <li>• model and identify a number from non-standard partitioning, eg, recognise 3 hundreds, 4 tens and 27 ones or <math>300 + 40 + 27</math> as 367</li> </ul>

Round any number to the nearest 10, 100 or 1,000			
Quest: Round numbers			
Learning Journey	Steps	Content	Description
Rounding numbers to the nearest 10, 100 or 1,000	1	Rounding numbers up to 1,000 to the nearest 10	<ul style="list-style-type: none"> <li>• round numbers up to 1,000 to the nearest 10</li> </ul>
	2	Rounding numbers up to 1,000 to the nearest 100	<ul style="list-style-type: none"> <li>• model a 3-digit number and recognise which hundred it is nearer to; explain reasoning</li> <li>• round a 3-digit number to the nearest 100, recognise the digit in the tens column as the key digit</li> </ul>
	3	Rounding numbers up to 10,000 to the nearest 1,000	<ul style="list-style-type: none"> <li>• model a 4-digit number and recognise which thousand it is nearer to; explain reasoning</li> <li>• round a 4-digit number to the nearest 1,000; recognise the digit in the hundreds column as the key digit</li> </ul>
	4	Rounding numbers up to 10,000 to the nearest 10, 100 or 1,000	<ul style="list-style-type: none"> <li>• round a 4-digit number to the nearest 10, 100 or 1,000; explain the rounding</li> </ul>
Quest: Round Roman numerals			
Rounding Roman numerals	1	Rounding Roman numerals up to 100 to the nearest 10	<ul style="list-style-type: none"> <li>• round a Roman numeral to the nearest 10</li> </ul>
	2	Rounding Roman numerals up to 1,000 to the nearest 100	<ul style="list-style-type: none"> <li>• model a Roman numeral to the nearest 100</li> </ul>

Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value			
Quest: Read Roman numerals to 100			
Learning Journey	Steps	Content	Description
Reading Roman numerals to 100	1	Reading and writing Roman numerals to 100 (I to C)	<ul style="list-style-type: none"> <li>• read and write Roman numerals to 100 (I to C)</li> </ul>
			<ul style="list-style-type: none"> <li>• understand that over time the number system changed to include the concept of 0 and place value</li> </ul>

## 5.2 Addition and subtraction

Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate			
Quest: Add and subtract multiples of 100			
Learning Journey	Steps	Content	Description
Adding and subtracting multiples of 100	1	Adding multiples of 100 up to 5 digits	<ul style="list-style-type: none"><li>• add multiples of 100 up to 5 digits</li><li>• solve addition problems using multiples of 100 up to 5 digits</li></ul>
	2	Subtracting multiples of 100 up to 5 digits	<ul style="list-style-type: none"><li>• subtract multiples of 100 up to 5 digits</li><li>• solve subtraction problems using multiples of 100 up to 5 digits</li></ul>
	3	Adding and subtracting multiples of 100 up to 5 digits	<ul style="list-style-type: none"><li>• add or subtract numbers up to 5 digits which are multiples of 100</li></ul>
Quest: Add and subtract multiples of 1,000			
Adding and subtracting multiples of 1,000	1	Adding and subtracting multiples of 1,000	<ul style="list-style-type: none"><li>• add multiples of 1,000</li></ul>
			<ul style="list-style-type: none"><li>• subtract multiples of 1,000</li></ul>
Quest: Formal addition: up to 4-digits			
Adding two 4-digit numbers - no exchange	1	Using a formal written algorithm for addition calculations up to four-digit numbers (no exchanging)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems without exchanging, with the same number of places and with a different number of places</li></ul>
			<ul style="list-style-type: none"><li>• use estimation or reverse operation to check the reasonableness of solutions</li></ul>
Adding two 4-digit numbers - one exchange	1	Using a formal written algorithm for addition calculations for two 4-digit numbers (with one exchange)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems with one exchange, with the same number of places and with a different number of places using models (bar models, place value models, place value grid, bar models)</li></ul>
			<ul style="list-style-type: none"><li>• solve problems using models (bar models, place value models, place value grid, bar models)</li></ul>
Adding two 4-digit numbers: more than one exchange	1	Using a formal written algorithm for addition calculations up to four-digit numbers (with exchanging)	<ul style="list-style-type: none"><li>• apply algorithms to solve problems with exchanging in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li></ul>
			<ul style="list-style-type: none"><li>• use estimation or reverse operation to check the reasonableness of solutions</li></ul>

Learning Journey	Step	Content	Description
<b>Quest: Formal subtraction: up to 4-digits</b>			
Subtracting two 4-digit numbers - no exchange	1	Using a formal written algorithm to record subtraction calculations involving up to four-digit numbers (without decomposing)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems</li> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>
Subtracting two 4-digit numbers - one exchange	1	Using a formal written algorithm for subtraction calculations for two 4-digit numbers (with one exchange)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems with one exchange, with the same number of places and with a different number of places. Use models to support calculation, eg place value model, place value grid, bar model</li> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>
Subtracting two 4-digit number- with exchange	1	Using a formal written algorithm to record subtraction calculations involving up to four-digit numbers (with decomposing)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems</li> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>

Estimate and use inverse operations to check answers to a calculation			
<b>Quest: Estimate &amp; use inverse operations</b>			
Learning Journey	Steps	Content	Description
Estimating and using inverse operations	1	Using inverse operations to complete addition and/or subtraction number sentences (2-digit numbers)	<ul style="list-style-type: none"> <li>• complete number sentences involving addition and subtraction by calculating missing numbers, eg find the missing numbers: <math>? + 55 = 83</math>, <math>? - 15 = 19</math></li> <li>• use inverse operations to complete number sentences</li> <li>• justify solutions when completing number sentences</li> </ul>



Learning Journey	Step	Content	Description
Checking accuracy of calculations	1	Checking accuracy of addition and subtraction calculations up to two 4-digit numbers	<ul style="list-style-type: none"> <li>• use estimation to check the reasonableness of answers to addition and subtraction calculations</li> </ul>
Estimating additions and subtractions	1	Estimating additions to the nearest 1,000	<ul style="list-style-type: none"> <li>• round numbers to the nearest multiple of 1,000 to estimate additions, eg <math>3,546 + 2,789</math> as <math>4,000 + 3,000</math> (with models)</li> </ul>
	2	Estimating subtractions to the nearest 1,000	<ul style="list-style-type: none"> <li>• round numbers to the nearest multiple of 1,000 to estimate additions, eg <math>3,812 + 1,489</math> as <math>4,000 + 1,000</math> (with models)</li> </ul>

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

**Quest: Solve 2-step problems in context**

Learning Journey	Steps	Content	Description
Solving addition and subtraction two-step problems	1	Solving simple two-step word problems with addition and subtraction (max sum of 100)	<ul style="list-style-type: none"> <li>• read and represent a two-step word problem using a letter for the unknown quantity</li> </ul>
			<ul style="list-style-type: none"> <li>• solve the problem using a variety of tools, models and strategies</li> </ul>

## 5.3 Multiplication and division

Recall multiplication and division facts for multiplication tables up to $12 \times 12$			
Quest: Explore multiplication by 6			
Learning Journey	Steps	Content	Description
Exploring multiplication by 6	1	Exploring multiplication by 6 up to 72	<ul style="list-style-type: none"> <li>• use concrete materials, models, drawings, number lines/charts to skip count by 6 from zero; explore patterns of the multiplication facts for 6 on a number chart</li> <li>• relate multiplication by 6 to double multiplication by 3</li> </ul>
Recalling and using multiplication by 6	1	Recalling and using multiplication facts for 6 (up to 72)	<ul style="list-style-type: none"> <li>• recall the multiplication facts for 6</li> <li>• solve multiplication problems with 6 including word problems</li> </ul>
Quest: Explore multiplication by 7			
Exploring multiplication by 7	1	Exploring multiplication by 7 up to 84	<ul style="list-style-type: none"> <li>• use concrete materials, models, drawings, number lines/charts to skip count by 7 from zero; explore patterns of the multiplication facts for 7 on a number chart</li> </ul>
Recalling and using multiplication by 7	1	Recalling and using multiplication facts for 7 (up to 84)	<ul style="list-style-type: none"> <li>• recall the multiplication facts for 7</li> <li>• solve multiplication problems with 7, including word problems</li> </ul>
Quest: Explore multiplication by 9			
Exploring multiplication by 9	1	Exploring multiplication by 9 up to 108	<ul style="list-style-type: none"> <li>• use concrete materials, models, drawings, number lines/charts to skip count by 9 from zero; explore patterns of the multiplication facts for 9 on a number chart</li> <li>• relate multiplication by 9 to multiplication by 10 (multiply by 10 and then subtract the extra group)</li> </ul>
Recalling and using multiplication by 9	2	Recalling and using multiplication facts for 9 (up to 108)	<ul style="list-style-type: none"> <li>• recall the multiplication facts for 9</li> <li>• solve multiplication problems with 9, including word problems</li> </ul>
Quest: Recall multiplication by 11			
Recalling multiplication	1	Multiplying by 11 (up to $12 \times$ )	<ul style="list-style-type: none"> <li>• recall the multiplication facts for 11</li> </ul>
Quest: Recall multiplication by 12			
Recalling multiplication	1	Multiplying by 12 (up to $12 \times$ )	<ul style="list-style-type: none"> <li>• recall the multiplication facts for 12</li> </ul>
Quest: Explore division by 6			
Exploring division by 6	1	Dividing by 6 up to 72	<ul style="list-style-type: none"> <li>• model and describe the related multiplication and division facts for 6 using models, drawings or manipulatives, eg <math>6 \times 3 = 18</math> and 18 divided by <math>3 = 6</math></li> <li>• relate division to how many (whole) times the divisor goes into the dividend</li> </ul>
Recalling and using division by 6	1	Recalling and using division facts for 6 up to 72	<ul style="list-style-type: none"> <li>• recall the division facts for 6</li> <li>• solve division problems with 6 including word problems</li> </ul>

Learning Journey	Step	Content	Description
<b>Quest: Explore division by 7</b>			
Exploring division by 7	1	Dividing by 7 up to 84	<ul style="list-style-type: none"> <li>• model and describe the related multiplication and division facts for 7 using models, drawings or manipulatives, eg <math>7 \times 3 = 21</math> and 21 divided by 3 = 7</li> <li>• relate division to how many (whole) times the divisor goes into the dividend</li> </ul>
Recalling and using division by 7	1	Recalling and using division facts for 7 up to 84	<ul style="list-style-type: none"> <li>• recall the division facts for 7</li> <li>• solve division problems with 7, including word problems</li> </ul>
<b>Quest: Explore division by 9</b>			
Exploring division by 9	1	Dividing by 9 up to 108	<ul style="list-style-type: none"> <li>• model and describe the related multiplication and division facts for 9 using models, drawings or manipulatives, eg <math>9 \times 3 = 27</math> and 27 divided by 3 = 9</li> <li>• relate division to how many (whole) times the divisor goes into the dividend</li> </ul>
Recalling and using division by 9	1	Recalling and using division facts for 9 up to 108	<ul style="list-style-type: none"> <li>• recall the division facts for 9</li> <li>• solve division problems with 9, including word problems</li> </ul>
<b>Quest: Divide by 11</b>			
Dividing by 11	1	Dividing by 11	<ul style="list-style-type: none"> <li>• recall the division facts for 11</li> <li>• solve division problems with 11, including word problems</li> </ul>
<b>Quest: Divide by 12</b>			
Dividing by 12	1	Dividing by 12	<ul style="list-style-type: none"> <li>• recall the division facts for 12</li> <li>• solve division problems with 12, including word problems</li> </ul>
<b>Quest: Multiply and divide by 6</b>			
Multiplying and dividing by 6	1	Multiplying and dividing by 6 up to 72	<ul style="list-style-type: none"> <li>• recall the multiplication facts and related division facts for 6</li> <li>• solve multiplication and division problems with 6, including word problems</li> </ul>
<b>Quest: Multiply and divide by 7</b>			
Multiplying and dividing by 7	1	Multiplying and dividing by 7 up to 84	<ul style="list-style-type: none"> <li>• recall the multiplication facts and related division facts for 7</li> <li>• solve multiplication and division problems with 7, including word problems</li> </ul>
<b>Quest: Multiply and divide by 9</b>			
Multiplying and dividing by 9	1	Multiplying and dividing by 9 up to 108	<ul style="list-style-type: none"> <li>• recall the multiplication facts and related division facts for 9</li> <li>• solve multiplication and division problems with 9, including word problems</li> </ul>

Learning Journey	Step	Content	Description
Quest: Multiply and divide by 11			
Multiplying and dividing by 11	1	Multiplying and dividing by 11	<ul style="list-style-type: none"><li>recall the multiplication facts and related division facts for 11</li></ul>
			<ul style="list-style-type: none"><li>solve multiplication and division problems with 11, including word problems</li></ul>
Quest: Multiply and divide by 12			
Multiplying and dividing by 12	1	Multiplying and dividing by 12	<ul style="list-style-type: none"><li>recall the multiplication facts and related division facts for 12</li></ul>
			<ul style="list-style-type: none"><li>solve multiplication and division problems with 12, including word problems</li></ul>

Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers			
<b>Quest: Use place value to multiply and divide</b>			
Learning Journey	Steps	Content	Description
Multiplying by 1 and 0	1	Multiplying by 1 or 0	<ul style="list-style-type: none"> <li>identify the effect of multiplication by 1 or 0</li> </ul>
Dividing by 1	1	Dividing by 1 using bar models	<ul style="list-style-type: none"> <li>identify the effect of division by 1 using bar models</li> </ul>
Multiplying 3 numbers	1	Multiplying 3 or more single-digit numbers using the commutative and associative laws	<ul style="list-style-type: none"> <li>apply the commutative law of multiplication</li> </ul>
			<ul style="list-style-type: none"> <li>explore and apply the associative law of multiplication, eg, <math>2 \times 3 \times 5 = 2 \times 5 \times 3 = 10 \times 3 = 30</math></li> </ul>

Recognise and use factor pairs and commutativity in mental calculations			
<b>Quest: Find and use factor pairs</b>			
Learning Journey	Steps	Content	Description
Finding and using factor pairs	1	Finding factors for whole numbers up to 100	<ul style="list-style-type: none"> <li>determine all 'factors' of a given whole number up to 100</li> </ul>
			<ul style="list-style-type: none"> <li>determine the 'highest common factor' (HCF) of 2 whole numbers</li> </ul>
			<ul style="list-style-type: none"> <li>determine whether a particular number is a factor of a given number using digital technologies</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that when a given number is divided by 1 of its factors, the result must be a whole number</li> </ul>

Multiply two-digit and three-digit numbers by a one-digit number using formal written layout			
<b>Quest: Multiply two-digit &amp; three-digit numbers</b>			
Learning Journey	Steps	Content	Description
Multiplying 2- and 3-digit numbers by 1-digit	1	Multiplying 2-digit numbers by 1-digit numbers using the contracted algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, with and without regrouping</li> <li>use inverse operations or digital technologies to check solutions</li> </ul>
	2	Multiplying 3-digit numbers by 1-digit numbers using the contracted algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, then the hundreds, with and without regrouping</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use inverse operations or digital technologies to check solutions</li> </ul>

## 5.4 Fractions including decimals

Recognise and show, using diagrams, families of common equivalent fractions			
Quest: Recognise & show equivalent fractions			
Learning Journey	Steps	Content	Description
Investigating common equivalent fractions	1	Investigating equivalent fractions up to and including 1 whole using a number line (denominators 2, 4 and 8; 3 and 6; 5 and 10 and 100)	<ul style="list-style-type: none"> <li>model, compare and represent equivalent fractions with related denominators using a number line</li> </ul>
			<ul style="list-style-type: none"> <li>create equivalent fractions using a number line</li> </ul>
			<ul style="list-style-type: none"> <li>solve word problems using equivalent fractions to make comparisons, including using measurements of length, eg Which is longer, <math>\frac{1}{2}</math> a metre or <math>\frac{3}{4}</math> of a metre?</li> </ul>
	2	Investigating equivalent fractions up to and including 1 whole using multiplication (denominators of 2, 4 and 8; 3 and 6; 5, 10 and 100)	<ul style="list-style-type: none"> <li>model, compare and represent the equivalence of fractions by recognising the factorial relationship between the numerators and denominators</li> <li>create equivalent fractions using multiplication</li> </ul>

Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10			
Quest: Count in hundredths			
Learning Journey	Steps	Content	Description
Counting in hundredths	1	Introducing hundredths	<ul style="list-style-type: none"> <li>recognise that hundredths come from 100 equal parts</li> </ul>
			<ul style="list-style-type: none"> <li>find hundredths of objects, sets and shapes</li> </ul>
			<ul style="list-style-type: none"> <li>find the whole from the part</li> </ul>
			<ul style="list-style-type: none"> <li>use language 'one hundredth', 'two hundredths' etc</li> </ul>
			<ul style="list-style-type: none"> <li>use symbols to represent fractions <math>\frac{1}{100}</math>, <math>\frac{2}{100}</math> etc</li> </ul>
	2	Counting in hundredths	<ul style="list-style-type: none"> <li>recognise that hundredths come from dividing 1-digit numbers or quantities by 100</li> </ul>
			<ul style="list-style-type: none"> <li>count up in hundredths using proper fractions and mixed numbers (starting from any multiple of tenths), including on a number line</li> </ul>
			<ul style="list-style-type: none"> <li>count down in hundredths using proper fractions and mixed numbers (starting from any multiple of tenths), including on a number line</li> </ul>
	3	Counting in hundredths as fractions	<ul style="list-style-type: none"> <li>represent counting in hundredths using number lines and models</li> </ul>
			<ul style="list-style-type: none"> <li>count up in hundredths using proper fractions (starting from any multiple of hundredth), including on a number line</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>count down in hundredths using proper fractions (starting from any multiple of hundredth), including on a number line</li> </ul>
<b>Quest: Connect tenths and hundredths</b>			
Reading and writing tenths & hundredths	1	Reading and writing tenths and hundredths	<ul style="list-style-type: none"> <li>read, write and represent tenths and hundredths in words, symbols and models, eg show 5 hundredths on a hundreds chart</li> </ul>
	2	Connecting tenths and hundredths	<ul style="list-style-type: none"> <li>recognise that hundredths are tenths divided into 10 equal parts and that <math>\frac{10}{100}</math> is equal to <math>\frac{1}{10}</math></li> <li>model and represent hundredths and tenths, eg <math>\frac{4}{10}</math> and <math>\frac{3}{100}</math> on a hundreds chart</li> </ul>

Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number			
<b>Quest: Solve problems: fractions</b>			
Learning Journey	Steps	Content	Description
Making a whole	1	Making a whole from any number of tenths and hundredths up to 1 whole (using models)	<ul style="list-style-type: none"> <li>make a whole from any number of tenths using models, eg hundred square, 100-bead rekenrek, part-whole models</li> <li>make a whole from any number of hundredths using models, eg hundred square, 100-bead rekenrek, part-whole models</li> </ul>
	2	Making a whole from any number of tenths and hundredths up to 5 wholes (using models)	<ul style="list-style-type: none"> <li>make a whole from any number of tenths using models, eg hundred square, 100-bead rekenrek, part-whole models</li> <li>make a whole from any number of hundredths using models, eg hundred square, 100-bead rekenrek, part-whole models</li> <li>make a whole from any number of tenths and hundredths using models, eg hundred square, 100-bead rekenrek, part-whole models</li> </ul>
Calculating fractions of a quantity	1	Finding a unit fraction of a quantity using multiplication and division facts (denominators 2-10 and multiples of the denominators only)	<ul style="list-style-type: none"> <li>find a unit fraction of a quantity/collection using multiplication and division facts (denominators 2-10 and multiples of the denominators only)</li> </ul>
	2	Finding a simple fraction of a quantity	<ul style="list-style-type: none"> <li>calculate a simple fraction of a collection/quantity</li> <li>explain how unit fractions can be used in the calculation of simple fractions of collections/quantities, eg 'To calculate <math>\frac{3}{8}</math> of a quantity, I found <math>\frac{1}{8}</math> of the collection first and then multiplied by 3'</li> </ul>

Learning Journey	Step	Content	Description
Problem solving: bar models to calculate the whole	1	Solving problems using bar models and tables to calculate the whole (including unit and non-unit proper fractions)	<ul style="list-style-type: none"> <li>calculate the whole through counting the quantity of parts (using bar models), eg, <math>\frac{1}{4} = 5</math>, <math>\frac{2}{4} = 10</math>, <math>\frac{3}{4} = 15</math>, <math>\frac{4}{4}</math> or 1 whole = 20</li> <li>calculate the whole through completing a table of whole, unit fraction and non-unit fraction, eg, the whole is 24, <math>\frac{1}{6}</math> of 24 = 4, <math>\frac{5}{6}</math> of 24 = 20</li> </ul>
	2	Solving word problems using proper fractions including unit and non-unit fractions (denominator less than 10)	<ul style="list-style-type: none"> <li>solve word problems using proper fractions including unit and non-unit fractions (denominator less than 10)</li> </ul>

Add and subtract fractions with the same denominator			
Quest: Add fractions: same denominator			
Learning Journey	Steps	Content	Description
Adding fractions with the same denominator	1	Using models to add unit fractions with the same denominators (1-20) to make fractions up to and including 1 whole	<ul style="list-style-type: none"> <li>use models to add unit fractions with the same denominator to make fractions up to and including one whole, eg <math>\frac{1}{3} + \frac{1}{3} + \frac{1}{3}</math></li> </ul>
	2	Adding simple fractions with the same denominator using models to make fractions up to and including 1 whole	<ul style="list-style-type: none"> <li>use models to add 2 or more fractions with the same denominator (up to and including one whole)</li> <li>solve problems involving adding fractions with the same denominator</li> </ul>
	3	Adding simple fractions with the same denominator using models (up to 3 wholes)	<ul style="list-style-type: none"> <li>use models to add 2 or more fractions with the same denominator</li> <li>solve problems involving adding fractions with the same denominator</li> <li>record answers greater than 1 as an improper fraction</li> </ul>
Quest: Subtract fractions: same denominator			
Subtracting fractions with the same denominator	1	Subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	<ul style="list-style-type: none"> <li>subtract proper fractions with the same denominator</li> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
	2	Subtracting simple fractions with the same denominator using models (up to 3 wholes)	<ul style="list-style-type: none"> <li>use models to subtract 2 or more fractions with the same denominator</li> <li>solve problems involving adding fractions with the same denominator</li> <li>record answers greater than 1 as an improper fraction</li> </ul>

Recognise and write decimal equivalents of any number of tenths or hundredths			
Quest: Write tenths as decimals			
Learning Journey	Steps	Content	Description
Introducing tenths as decimals	1	Introducing decimal tenths	<ul style="list-style-type: none"> <li>recognise that the place value system can be extended to tenths</li> <li>represent tenths using concrete materials and written representations</li> </ul>



Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• recognise that tenths arise from dividing an object into 10 equal parts</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that tenths arise from dividing a one-digit number or quantity by 10</li> </ul>
			<ul style="list-style-type: none"> <li>• identify decimals on a number line</li> </ul>
			<ul style="list-style-type: none"> <li>• represent decimals using models and place value equipment such as base ten and arrow cards, place value grid, hundred square</li> </ul>
Counting in tenths as decimals	1	Counting in decimal tenths	<ul style="list-style-type: none"> <li>• count forwards and backwards by tenths from any decimal number expressed to 1 decimal place, using concrete materials and number lines, eg use base ten materials to represent 3.7 and count forward: 3.8, 3.9, 4.0, 4.1, ...</li> </ul>
	2	Connecting decimal fractions to common fractions involving tenths	<ul style="list-style-type: none"> <li>• understand the relationship between decimal fractions and common fractions involving tenths</li> <li>• recognise and apply decimal notation to express whole numbers and tenths as decimals, eg 0.1 is the same as <math>\frac{1}{10}</math></li> <li>• investigate equivalences using various methods, eg use a number line or a calculator to show that <math>\frac{1}{2}</math> is the same as 0.5 and <math>\frac{5}{10}</math></li> </ul>
<b>Quest: Write hundredths as decimals</b>			
Introducing decimal hundredths	1	Introducing decimal hundredths	<ul style="list-style-type: none"> <li>• recognise that the place value system can be extended to tenths and hundredths</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10</li> </ul>
			<ul style="list-style-type: none"> <li>• state the place value of digits in decimal numbers of up to 2 decimal places</li> </ul>
			<ul style="list-style-type: none"> <li>• read decimal fractions correctly, ie 'six point one nine' rather than 'six point nineteen'</li> </ul>

Recognise and write decimal equivalents to $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$			
<b>Quest: Recognise and write decimal equivalents</b>			
Learning Journey	Steps	Content	Description
Recognising and write decimal equivalents	1	Connecting fraction and decimal equivalences for $\frac{1}{2}$ , $\frac{1}{4}$ and $\frac{3}{4}$	<ul style="list-style-type: none"> <li>• connect fraction and decimal equivalences for <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math> and <math>\frac{3}{4}</math> using models, decimal and fraction notation</li> </ul>
	2	Connecting decimal fractions to common fractions involving hundredths	<ul style="list-style-type: none"> <li>• understand the relationship between decimal fractions and common fractions involving hundredths</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>recognise and apply decimal notation to express whole numbers and hundredths as decimals, eg 0.15 is the same as <math>\frac{15}{100}</math></li> </ul>

Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

**Quest: Divide by 10 and 100**

Learning Journey	Steps	Content	Description
Dividing by 10	1	Dividing 1-digit numbers by 10 (decimal answers)	<ul style="list-style-type: none"> <li>divide 1-digit numbers by 10 and demonstrate that the answer is 10 times smaller by using place value models (Gattegno chart and place value model) eg, <math>7 \div 10 = 0.7</math></li> </ul>
	2	Dividing 2-digit numbers by 10 (decimal answers)	<ul style="list-style-type: none"> <li>divide 2-digit numbers by 10 and demonstrate that the answer is 10 times smaller by using place value models (Gattegno chart and place value model) eg, <math>72 \div 10 = 7.2</math></li> </ul>
Dividing by 100	1	Dividing 1- or 2- digit numbers by 100 using models	<ul style="list-style-type: none"> <li>use models to divide whole numbers by 100, eg, <math>7,000 \div 100</math>, <math>700 \div 100</math>, <math>70 \div 100</math>, <math>7 \div 100</math> (place value tables and number sentences)</li> </ul>

Round decimals with one decimal place to the nearest whole number

**Quest: Round decimals with one decimal place**

Learning Journey	Steps	Content	Description
Rounding decimals to the nearest whole number	1	Rounding decimal tenths	<ul style="list-style-type: none"> <li>round tenths to the nearest whole number</li> </ul>

Compare numbers with the same number of decimal places up to two decimal places

**Quest: Compare and order decimal numbers to 2dp**

Learning Journey	Steps	Content	Description
Comparing and ordering decimal numbers	1	Comparing and ordering decimal tenths	<ul style="list-style-type: none"> <li>compare and order tenths using <math>&gt;</math>, <math>&lt;</math> and <math>=</math></li> </ul>
	2	Comparing and ordering decimal hundredths	<ul style="list-style-type: none"> <li>compare numbers with the same number of decimal places up to 2 decimal places</li> </ul>

Solve simple measure and money problems involving fractions and decimals to two decimal places

**Quest: Add and subtract decimals**

Learning Journey	Steps	Content	Description
Adding and subtract decimals	1	Using money: Addition and subtraction problems   United Kingdom	<ul style="list-style-type: none"> <li>use addition and subtraction to solve a variety of problems involving purchases of 2 or more items, including calculating change, and record the value using a decimal point and the symbol £</li> </ul>

## 6 Measurement

### 6.1 Measurement

Convert between different units of measure [for example, kilometre to metre; hour to minute]			
Quest: Convert units of measure - Length			
Learning Journey	Steps	Content	Description
Converting - km, m, cm and mm	1	Converting between metres and centimetres (whole numbers only)	• describe 1 m as 100 cm
			• convert between metres and centimetres using whole numbers, eg 3 m is the same as 300 cm
			• record measurement equivalents in a table
			• explain the relationship between the size of a unit and the number of units needed
	2	Converting between centimetres and millimetres (whole numbers only)	• describe 1 cm as 10 mm
			• convert between centimetres and millimetres using whole numbers
			• record measurement equivalents in a table
			• explain the relationship between the size of a unit and the number of units needed
	3	Converting between kilometres and metres (whole numbers only)	• describe 1 km as 1000 m
			• convert between kilometres and metres using whole numbers
			• record measurement equivalents in a table
			• explain the relationship between the size of a unit and the number of units needed
Quest: Convert units of measure - Time			
Converting units of time	1	Converting between units of time (multiplicative conversions only)	• calculate the number of seconds in a whole number of minutes
			• calculate the number of minutes in a whole number of hours
			• calculate the number of days in a whole number of weeks
			• calculate the number of months in a whole number of years
			• solve problems involving conversion between units of time

Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres			
Quest: Measure and calculate perimeter			
Learning Journey	Steps	Content	Description
Measuring and calculating perimeters	1	Calculating the perimeter of rectilinear shapes on a grid (informal units)	• calculate the perimeter of rectilinear shapes by counting squares on a grid
	2	Calculating the perimeters of rectangles	• use the term 'dimensions' to describe the 'lengths' and 'widths' of rectangles and squares

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• measure and calculate the perimeter of a large rectangular section of the school</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that rectangles with the same perimeter may have different dimensions</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that rectangles with dimensions given in different units may have the same perimeter</li> </ul>
			<ul style="list-style-type: none"> <li>• explore different methods of finding the perimeter of rectangles</li> </ul>
			<ul style="list-style-type: none"> <li>• create a rule to find the perimeter of any rectangle</li> </ul>
	3	Calculating the side length of a rectangle given the perimeter	<ul style="list-style-type: none"> <li>• find the length of 1 unknown side of a rectangle given the perimeter</li> </ul>
			<ul style="list-style-type: none"> <li>• find possible length combinations of 2 unknown sides of a rectangle given the perimeter</li> </ul>
	4	Calculating the perimeter of rectilinear shapes using a formula	<ul style="list-style-type: none"> <li>• calculate the perimeters of rectilinear shapes using a formula</li> </ul>

Find the area of rectilinear shapes by counting squares			
Quest: Find the area of rectilinear shapes			
Learning Journey	Steps	Content	Description
Finding the area of rectilinear shapes	1	Measuring and estimating areas of rectangles using a square unit	<ul style="list-style-type: none"> <li>• establish usefulness of using a square unit to find an area as it allows for an array structure and does not have gaps or overlaps</li> </ul>
			<ul style="list-style-type: none"> <li>• compare the same area measured using different sized square unit</li> </ul>
			<ul style="list-style-type: none"> <li>• understand that the larger the unit square, the smaller the number of units needed and likewise the smaller the square unit, the larger the number of units needed</li> </ul>
	2	Measuring and estimating areas of rectilinear shapes using a square unit	<ul style="list-style-type: none"> <li>• establish usefulness of using a square unit to find an area as it allows for an array structure and does not have gaps or overlaps</li> </ul>
			<ul style="list-style-type: none"> <li>• compare the same area measured using different sized square unit</li> </ul>
			<ul style="list-style-type: none"> <li>• understand that the larger the unit square, the smaller the number of units needed and likewise the smaller the square unit, the larger the number of units needed</li> </ul>

Estimate, compare and calculate different measures, including money in pounds and pence			
Quest: Money: Estimate, compare, calculate			
Learning Journey	Steps	Content	Description
Estimating and rounding amounts of money	1	Rounding and estimating amounts of money to the nearest pound using decimal notation	<ul style="list-style-type: none"> <li>determine one or more notes and coins that have enough value to make a purchase of one or more items</li> </ul>
			<ul style="list-style-type: none"> <li>calculate the change required when making purchases using cash and record values in dollars and cents separately (no decimal point)</li> </ul>
Comparing amounts of money (inequality symbols)	1	Comparing amounts of money using inequality symbols	<ul style="list-style-type: none"> <li>compare amounts of money using inequality symbols, eg 6,209p &gt; £60.09</li> </ul>
	2	Ordering amounts of money (up to four items)	<ul style="list-style-type: none"> <li>order amounts of money in ascending or descending sequence, represented in the same format, eg 4,234p and 4,142p or £42.34 and £41.42</li> </ul>
Solving word problems involving money	1	Solving simple word problems involving money (pounds and pence)	<ul style="list-style-type: none"> <li>solve word problems using coins, eg would you rather have five 50p coins or twelve 20p coins?</li> </ul>

Read, write and convert time between analogue and digital 12- and 24-hour clocks			
Quest: Read, write and convert units of time			
Learning Journey	Steps	Content	Description
Reading, writing and converting units of time	1	Telling time to five minutes (digital)	<ul style="list-style-type: none"> <li>read time on 12-hour digital clocks to 5 minutes using the terms 'o'clock', 'past' and 'to', including 'half past', 'quarter past' and 'quarter to'</li> </ul>
			<ul style="list-style-type: none"> <li>record times on analogue clocks to 5 minutes in 12-hour digital format</li> </ul>
			<ul style="list-style-type: none"> <li>position or draw the hands on an analogue clock to show time to 5 minutes where the time is given in 12-hour digital format</li> </ul>
			<ul style="list-style-type: none"> <li>connect 12-hour digital displays for times to 5 minutes to their corresponding display on an analogue clock</li> </ul>
	2	Telling time to the minute (digital)	<ul style="list-style-type: none"> <li>read time on 12-hour digital clocks to the minute using the terms 'o'clock', 'past' and 'to', including 'half-past', 'quarter past' and 'quarter to' and write in words</li> </ul>
			<ul style="list-style-type: none"> <li>record times on analogue clocks to the minute in 12-hour digital format</li> </ul>
			<ul style="list-style-type: none"> <li>position or draw the hands on an analogue clock to show time to the minute where the time is given in 12-hour digital format</li> </ul>
			<ul style="list-style-type: none"> <li>connect 12-hour digital displays for times, to the minute, to their corresponding display on an analogue clock</li> </ul>

Learning Journey	Step	Content	Description
	3	Using 24-hour notation	<ul style="list-style-type: none"> <li>• recognise 24-hour time notation as an alternative to 12-hour time notation</li> <li>• describe familiar situations in which 24-hour time is used such as transport timetables, armed forces, on household appliances</li> <li>• identify whether a time expressed in 24-hour time notation represents a time before or after midday/noon</li> <li>• convert between 24-hour time notation and 12-hour time notation</li> <li>• convert between analogue and 24-hour digital clocks</li> <li>• record 24-hour time using necessary conventions</li> <li>• read and write time on 24-hour digital clocks to the minute using the terms o'clock, past and to, including half-past, quarter past, and quarter to</li> </ul>

## 7 Geometry

### 7.1 Properties of shape

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes			
Quest: Compare and classify geometric shapes			
Learning Journey	Steps	Content	Description
Comparing and classifying quadrilaterals	1	Identifying side length properties of quadrilaterals	<ul style="list-style-type: none"> <li>measure and describe the side properties of the special quadrilaterals, including parallelograms, rectangles, rhombuses, squares, trapeziums and kites</li> </ul>
			<ul style="list-style-type: none"> <li>identify and sort quadrilaterals by their side lengths and number of parallel sides</li> </ul>
	2	Identifying right angles in quadrilaterals	<ul style="list-style-type: none"> <li>identify right angles in quadrilaterals</li> </ul>
			<ul style="list-style-type: none"> <li>sort quadrilaterals by those with and without right angles</li> </ul>
	3	Sorting and naming quadrilaterals	<ul style="list-style-type: none"> <li>sort the special quadrilaterals; explain the attribute used to sort, eg, angle, parallel sides, side lengths; classify quadrilaterals into categories and subcategories</li> </ul>
			<ul style="list-style-type: none"> <li>identify and name the special quadrilaterals in different orientations, including parallelograms, rectangles, rhombuses, squares, trapezia and kites</li> <li>explore and explain the given names of the quadrilaterals, eg, parallelogram</li> </ul>
Comparing and classifying triangles	1	Classifying triangles by their sides and angles	<ul style="list-style-type: none"> <li>identify and name right-angled, equilateral, isosceles and scalene triangles</li> </ul>
			<ul style="list-style-type: none"> <li>compare and describe features of the sides and angles of equilateral, isosceles and scalene triangles</li> </ul>
			<ul style="list-style-type: none"> <li>identify triangles that are right-angled as well as scalene or isosceles</li> </ul>
			<ul style="list-style-type: none"> <li>explore, by measurement, side and angle properties of equilateral, isosceles and scalene triangles</li> </ul>

Identify acute and obtuse angles and compare and order angles up to two right angles by size			
Quest: Identify, compare and order angles			
Learning Journey	Steps	Content	Description
Identifying, comparing and ordering angles	1	Classifying angles as acute, right or obtuse	<ul style="list-style-type: none"> <li>identify and name angles as acute, right or obtuse</li> </ul>
			<ul style="list-style-type: none"> <li>categorise angles as acute, right or obtuse</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>draw and create angles of a given size: acute, right, obtuse (no protractors)</li> </ul>
	2	Comparing and ordering angles in a shape using statements and inequality symbols	<ul style="list-style-type: none"> <li>compare and order angles using statements and inequality symbols, eg Angle A is [ &lt;, &gt; or = ] Angle B</li> </ul>

Identify lines of symmetry in 2-D shapes presented in different orientations			
Quest: Identify lines of symmetry in 2-D shapes			
Learning Journey	Steps	Content	Description
Identifying lines of symmetry in 2-D shapes	1	Recognising line symmetry of shapes	<ul style="list-style-type: none"> <li>define the line of symmetry of a 2D shape as a line across which the shape can be folded into 2 matching parts</li> </ul>
			<ul style="list-style-type: none"> <li>identify a line of symmetry in 2D shapes</li> </ul>
			<ul style="list-style-type: none"> <li>sort 2D shapes according to whether they are symmetrical or not</li> </ul>

Complete a simple symmetric figure with respect to a specific line of symmetry.			
Quest: Draw lines of symmetry			
Learning Journey	Steps	Content	Description
Drawing lines of symmetry	1	Drawing lines of symmetry on given designs and shapes	<ul style="list-style-type: none"> <li>recognise that some designs and shapes may have more than 1 line of symmetry</li> </ul>
			<ul style="list-style-type: none"> <li>identify and draw all lines of symmetry on designs and shapes</li> </ul>
			<ul style="list-style-type: none"> <li>determine the total number of lines of symmetry on designs and shapes</li> </ul>
			<ul style="list-style-type: none"> <li>determine whether or not a given line through designs and shapes is a line of symmetry</li> </ul>
	2	Completing symmetrical designs	<ul style="list-style-type: none"> <li>complete symmetrical designs and shapes given their line of symmetry and one half of the design or shape</li> </ul>



## 7.2 Position and direction

Describe positions on a 2-D grid as coordinates in the first quadrant			
Quest: Describe position - first quadrant			
Learning Journey	Steps	Content	Description
Describing positions on a 2-D grid as coordinates	1	Recording the position of points on a Cartesian plane using x and y coordinates	<ul style="list-style-type: none"> <li>record the position of points on a Cartesian plane using x and y coordinates</li> </ul>
	2	Plotting points in the Cartesian coordinate system in the first quadrant only	<ul style="list-style-type: none"> <li>plot points on a Cartesian plane using x and y coordinates</li> </ul>

Describe movements between positions as translations of a given unit to the left/right and up/down			
Quest: Describe translations - coordinate grid			
Learning Journey	Steps	Content	Description
Describing movement between positions	1	Translating points on the Cartesian plane in the first quadrant only	<ul style="list-style-type: none"> <li>follow two-step instructions to translate points or shapes on a Cartesian plane eg, 1 up 2 right</li> <li>follow three step instructions to translate points or shapes on a Cartesian plane eg, 1 up 2 right, 1 up</li> </ul>
	2	Describing the translation and movement of points and shapes on the Cartesian plane	<ul style="list-style-type: none"> <li>describe the translation and movement of a point or shape on the Cartesian plane using specific language such as: left/right/up/down</li> </ul>

Plot specified points and draw sides to complete a given polygon			
Quest: Find missing coordinates on polygons			
Learning Journey	Steps	Content	Description
Plotting specified points to complete a polygon	1	Finding the missing coordinate of a figure in the first quadrant only	<ul style="list-style-type: none"> <li>find the missing coordinate of a figure with a Cartesian plane (first quadrant only)</li> </ul>
	2	Plotting points from coordinates to create a shape, first quadrant only	<ul style="list-style-type: none"> <li>plot a sequence of coordinates to create a shape in the first quadrant</li> </ul>

## 8 Statistics

### 8.1 Statistics

Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs			
Quest: Interpret and present data: bar chart			
Learning Journey	Steps	Content	Description
Interpreting and presenting data in a bar chart	1	Representing data in a bar chart with a scale of 1, 2, 5 or 10	<ul style="list-style-type: none"> <li>construct a vertical or horizontal bar chart using grid paper for support, where appropriate use a scale of eg, 2, 5, or 10 to 1</li> </ul>
			<ul style="list-style-type: none"> <li>use graphing software to enter data and create bar charts that represent data</li> </ul>
			<ul style="list-style-type: none"> <li>mark equal spaces on axes, name and label axes, and choose appropriate titles for bar charts; use the terms 'horizontal axis', 'vertical axis' and 'axes' appropriately</li> </ul>
			<ul style="list-style-type: none"> <li>ask and answer one-step and two-step questions, eg, 'How many more students like reading than art?'; make conclusions about data presented in a bar chart, eg, 'Football is the most popular sport for students in Year 3 at our school'</li> </ul>
	2	Reading data in a bar chart with a scale of 1, 2, 5 or 10	<ul style="list-style-type: none"> <li>ask and answer one-step and two-step questions, eg, 'How many more students like reading than art?'</li> </ul>
			<ul style="list-style-type: none"> <li>make conclusions about data presented in a bar chart, eg, 'Football is the most popular sport for students in Year 3 at our school'</li> </ul>
			<ul style="list-style-type: none"> <li>compare bar charts with pictograms</li> </ul>
			<ul style="list-style-type: none"> <li>evaluate simple statements made by others relating to data in a bar chart</li> </ul>
	3	Introducing bar charts with many-to-one correspondence	<ul style="list-style-type: none"> <li>determine the scale on a bar chart</li> </ul>
			<ul style="list-style-type: none"> <li>read and interpret data in a bar chart with many-to-one correspondence</li> </ul>
	4	Representing data in bar charts using many-to-one correspondence	<ul style="list-style-type: none"> <li>recognise and remedy errors or unsuitable scales in a bar chart</li> </ul>
			<ul style="list-style-type: none"> <li>represent given or collected categorical data in bar charts</li> </ul>
			<ul style="list-style-type: none"> <li>discuss and determine a suitable scale of many-to-one correspondence to draw charts for large data sets and state the key used</li> </ul>
			<ul style="list-style-type: none"> <li>use grid paper to assist in drawing charts that represent data using a scale of many-to-one correspondence</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"><li>• use data in a spreadsheet to create bar charts with appropriately labelled axes</li></ul>
			<ul style="list-style-type: none"><li>• mark equal spaces on axes, name and label axes, and choose appropriate titles for charts</li></ul>
			<ul style="list-style-type: none"><li>• interpret data in bar chart; ask and answer questions related to the data in the display; draw conclusions</li></ul>
Quest: Interpret and present data: line graph			
Interpreting and presenting data in line graphs	1	Introducing and reading line graphs	<ul style="list-style-type: none"><li>• become familiar with the structure of a line graph</li></ul>
			<ul style="list-style-type: none"><li>• read and interpret a basic line graph displaying time series data</li></ul>

Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.			
<b>Quest: Solve comparison/sum/difference problems</b>			
Learning Journey	Steps	Content	Description
Solving comparison, sum and difference problems	1	Comparing basic data displays (tables, lists, pictograms, bar charts)	<ul style="list-style-type: none"> <li>• represent the same data set using more than one type of display (tables, lists, pictograms or bar charts) and compare the displays</li> <li>• discuss the advantages and/or disadvantages of different representations of the same data</li> <li>• describe information and make conclusions about data presented in different data displays, eg, 'Football is the most popular sport for students in Year 3 at our school'</li> </ul>
	2	Solving problems using bar charts, pictograms, tables	<ul style="list-style-type: none"> <li>• solve comparison, addition and subtraction problems using a range of data displays</li> </ul>

## Part III

# Year 5

## 9 Number

### 9.1 Number and place value

Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit			
Quest: Read and write numbers to 1,000,000			
Learning Journey	Steps	Content	Description
Reading and writing numbers to 1,000,000	1	Reading and writing numbers up to 5 digits	• apply an understanding of place value to read numbers up to 5 digits
			• apply an understanding of place value to write numbers up to 5 digits
	2	Reading and writing 6-digit numbers	• apply an understanding of place value to read numbers of up to 6 digits
			• apply an understanding of place value to write numbers of up to 6 digits
	3	Reading and writing numbers of any size	• apply an understanding of place value to read numbers of any size
			• apply an understanding of place value to write numbers of any size
Identifying place value, numbers to 1,000,000	1	Identifying the place value of digits in numbers up to 5 digits	• state the place value of digits in numbers of up to 5 digits
			• pose and answer questions that extend place value understanding of numbers, eg, 'What happens if I rearrange the digits in the number 12,345?', 'How can I rearrange the digits to make the largest number?'
			• represent and describe whole numbers to 10,000 pictorially and symbolically
	2	Identifying the place value of 6-digit numbers	• state the place value of digits in numbers of up to 6 digits
			• pose and answer questions that extend place value understanding of numbers, eg, 'What happens if I rearrange the digits in the number 128,345?', 'How can I rearrange the digits to make the largest number?'
			• represent and describe whole numbers to 1,000,000
	3	Identifying the place value of numbers of any size	• state the place value of digits in numbers of any size
			• pose and answer questions that extend place value understanding of numbers, eg, 'What happens if I rearrange the digits in the number 2,312,345?', 'How can I rearrange the digits to make the largest number?'

Learning Journey	Step	Content	Description
Comparing and ordering numbers to 1,000,000			<ul style="list-style-type: none"> <li>● recognise different abbreviations of numbers used in everyday contexts, eg, £35 M represents £35,000,000</li> <li>● understand the role of zero as a placeholder</li> <li>● use place value understanding to count by 10,000 and 100,000</li> </ul>
		Comparing 5-digit numbers using words and symbols	● compare two 5-digit numbers using words and symbols <, =, >
		Ordering 5-digit numbers	● arrange numbers up to 5 digits in ascending and descending order
	2	Comparing two 6-digit numbers	● compare two 6-digit numbers using words and symbols <, =, >
		Ordering 6-digit numbers	● arrange numbers up to 6 digits in ascending and descending order
	3	Comparing 2 numbers of any size	● compare 2 numbers of any size using words and symbols <, =, >
		Ordering numbers of any size	● arrange numbers of any size in ascending and descending order
Using place value to partition numbers	1	Using place value to partition 5-digit numbers	● use place value to partition numbers of up to 5 digits, eg, 67,012 is $60,000 + 7,000 + 10 + 2$
	2	Using place value to partition 6-digit numbers	● use place value to partition numbers of up to 6 digits, eg, 672,012 is $600,000 + 70,000 + 2,000 + 10 + 2$
	3	Using place value to partition numbers of any size	● use place value understanding and models to partition numbers of any size
Using non-standard partitioning	1	Using non-standard partitioning with 5-digit numbers	● partition numbers of up to 5 digits in non-standard forms, eg, 67,000 as $50,000 + 17,000$
	2	Using non-standard partitioning with 6-digit numbers	● partition numbers of up to 6 digits in non-standard forms, eg, 670,000 as $500,000 + 170,000$
		Using non-standard partitioning with numbers of any size	● partition numbers of any size in non-standard forms

Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000			
Quest: Count in steps of powers of 10			
Learning Journey	Steps	Content	Description
Counting in steps of powers of 10 up to 1,000,000	1	Understanding the role of place value when increasing or decreasing a digit in a number	<ul style="list-style-type: none"> <li>● find numbers 1, 10, 100, 1000, 10,000, 10, 000 before or after a given number by applying place value knowledge</li> <li>● count in steps of powers of 10</li> </ul>

Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0

**Quest: Interpret negative numbers in context**

Learning Journey	Steps	Content	Description
Interpreting negative numbers in context	1	Interpreting negative integers in context	<ul style="list-style-type: none"> <li>interpret negative integers in context eg, difference in temperature, or when finding the difference between two numbers, or halfway point</li> </ul>

Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000

**Quest: Round numbers within 1,000,000**

Learning Journey	Steps	Content	Description
Rounding numbers within 1,000,000	1	Rounding up to 5-digit numbers to the nearest 10, 100 or 1,000	<ul style="list-style-type: none"> <li>round up to the nearest 10, 100 or 1,000</li> </ul>
	2	Rounding 5-digit numbers	<ul style="list-style-type: none"> <li>round to the nearest 10, 100, 1,000 or 10,000</li> </ul>
	3	Rounding 6-digit numbers	<ul style="list-style-type: none"> <li>round 6-digit numbers to any place value</li> </ul>

Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals

**Quest: Read and write Roman numerals to 1,000**

Learning Journey	Steps	Content	Description
Reading and writing Roman numerals to 1,000	1	Reading and writing Roman numerals to 1,000 (M)	<ul style="list-style-type: none"> <li>read and write Roman numerals to 1,000 (M)</li> </ul>
			<ul style="list-style-type: none"> <li>recognise years written in Roman numerals</li> </ul>

## 9.2 Addition and subtraction

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)			
Quest: Add/subtract numbers up to 5 digits			
Learning Journey	Steps	Content	Description
Adding whole numbers up to 5 digits	1	Using a formal written algorithm for addition calculations up to five-digit numbers (no exchanging)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems without exchanging, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>
	2	Using a formal written algorithm for addition calculations up to five-digit numbers (with regrouping)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems with regrouping in 1 or more places, with the same number of places and with a different number of places; include opportunities for students to write their own algorithms with digits in correct place value positions; include word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>
Subtracting whole numbers up to 5 digits	1	Using a formal written algorithm to record subtraction calculations involving up to five-digit numbers (without decomposing)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems without trading (decomposing), with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>
	2	Using a formal written algorithm to record subtraction calculations involving up to five-digit numbers (with decomposing)	<ul style="list-style-type: none"> <li>• apply algorithms to solve problems with trading (decomposing) in 1 or more places, with the same number of places for both numbers, with fewer places in the second number (subtrahend) and with and without 1 or more zeros in the first number (minuend); include opportunities for students to write their own algorithms with digits in correct place value positions and with the larger number first; include word problems</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use estimation or reverse operation to check the reasonableness of solutions</li> </ul>

### Add and subtract numbers mentally with increasingly large numbers

#### Quest: Apply efficient add/subtract strategies

Learning Journey	Steps	Content	Description
Applying efficient add/subtract strategies	1	Applying efficient strategies for addition and subtraction calculations involving numbers of any size	<ul style="list-style-type: none"> <li>• add 3 or more numbers with different numbers of digits</li> </ul>
			<ul style="list-style-type: none"> <li>• use mental and/or written strategies efficiently</li> </ul>
			<ul style="list-style-type: none"> <li>• use mathematical language to describe addition and subtraction strategies</li> </ul>
			<ul style="list-style-type: none"> <li>• apply efficient strategies to solve word problems involving addition and subtraction</li> </ul>
			<ul style="list-style-type: none"> <li>• represent calculations using appropriate recording strategies</li> </ul>
			<ul style="list-style-type: none"> <li>• justify the choice of strategy for a given calculation</li> </ul>

### Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

#### Quest: Use rounding to check calculations

Learning Journey	Steps	Content	Description
Checking accuracy: addition/subtraction	1	Checking accuracy of addition and subtraction calculations	<ul style="list-style-type: none"> <li>• check solutions to problems by using the inverse operation</li> </ul>
			<ul style="list-style-type: none"> <li>• round numbers appropriately when obtaining estimates to numerical calculations</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation to check the reasonableness of answers to addition and subtraction calculations</li> </ul>
	2	Checking accuracy of addition and subtraction calculations with 4-digit and 5-digit numbers	<ul style="list-style-type: none"> <li>• check solutions to problems by using the inverse operation</li> </ul>
			<ul style="list-style-type: none"> <li>• round numbers appropriately when obtaining estimates to numerical calculations</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation to check the reasonableness of answers to addition and subtraction calculations</li> </ul>

### Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

#### Quest: Solve multi-step add/subtract problems

Learning Journey	Steps	Content	Description
Solving two-step addition and subtraction problems	1	Solving addition and subtraction two-step problems in context (max sum 1,000)	<ul style="list-style-type: none"> <li>• read and interpret a word problem</li> <li>• decide which operations and strategies to use and explain why</li> </ul>



Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• solve an addition and subtraction two-step problem</li> </ul>
	2	Solving addition and subtraction two-step problems in context (max sum 10,000)	<ul style="list-style-type: none"> <li>• read and interpret a word problem</li> <li>• decide with operations and strategies to use and explain why</li> </ul>
			<ul style="list-style-type: none"> <li>• solve an addition and subtraction two-step problem</li> </ul>

## 9.3 Multiplication and division

Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers			
Quest: Identify multiples and factors			
Learning Journey	Steps	Content	Description
Identifying multiples up to 100	1	Introducing multiples up to 100	<ul style="list-style-type: none"> <li>find 'multiples' for a given whole number</li> </ul>
Identifying factors and common factors	1	Introducing factors for numbers up to 100	<ul style="list-style-type: none"> <li>determine 'factors' for a given whole number</li> <li>connect number relationships involving multiplication to factors of a number</li> </ul>
	2	Finding common factors for two numbers	<ul style="list-style-type: none"> <li>find common factors for two numbers</li> </ul>

Establish whether a number up to 100 is prime and recall prime numbers up to 19			
Quest: Introduce prime and composite numbers			
Learning Journey	Steps	Content	Description
Introducing prime and composite numbers	1	Introducing prime and composite numbers	<ul style="list-style-type: none"> <li>establish and define prime numbers</li> </ul>
			<ul style="list-style-type: none"> <li>establish and define composite numbers</li> </ul>
			<ul style="list-style-type: none"> <li>know and recall all prime numbers up to 19</li> </ul>

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers			
Quest: Multiply numbers up to 4 digits			
Learning Journey	Steps	Content	Description
Multiplying numbers up to 4 digits: expanded form	1	Multiplying 4-digit numbers by 1-digit numbers using the expanded algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>model the method with place value models or diagrams; relate to the area model</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using inverse solutions or digital technologies</li> </ul>
	2	Multiplying 2-digit numbers by 2-digit numbers using the extended form of the formal algorithm	<ul style="list-style-type: none"> <li>multiply 2-digit by 2-digit numbers using extended form, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using digital technologies</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations to justify solutions</li> </ul>
	3	Multiplying 3-digit numbers by 2-digit numbers using the extended form of the formal algorithm	<ul style="list-style-type: none"> <li>multiply 3-digit by 2-digit numbers using extended form, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using digital technologies</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations to justify solutions</li> </ul>

Learning Journey	Step	Content	Description
	4	Multiplying 4-digit numbers by 2-digit numbers using the expanded algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>model the method with place value models or diagrams; relate to the area model</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using inverse solutions or digital technologies</li> </ul>
Multiplying numbers up to 4 digits: area model	1	Multiplying 3-digit numbers by 1-digit numbers using an area model	<ul style="list-style-type: none"> <li>use an area model for 3-digit by 1-digit multiplication</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using digital technologies</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations to justify solutions</li> </ul>
	2	Multiplying 4-digit numbers by 1-digit numbers using an area model	<ul style="list-style-type: none"> <li>use an area model for 4-digit by 1-digit multiplication</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using digital technologies</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations to justify solutions</li> </ul>
Multiplying numbers up to 4-digits: algorithm	3	Multiplying 2-digit numbers by 2-digit numbers using an area model	<ul style="list-style-type: none"> <li>use an area model for 2-digit by 2-digit multiplication</li> </ul>
			<ul style="list-style-type: none"> <li>check answers to mental calculations using digital technologies</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations to justify solutions</li> </ul>
	1	Multiplying 3-digit numbers by 1-digit numbers using the contracted algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, then the hundreds, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations or digital technologies to check solutions</li> </ul>
	2	Multiplying 4-digit numbers by 1-digit numbers using the contracted algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations or digital technologies to check solutions</li> </ul>
	3	Multiplying 4-digit numbers by 2-digit numbers using the contracted algorithm	<ul style="list-style-type: none"> <li>multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping</li> </ul>
			<ul style="list-style-type: none"> <li>use inverse operations or digital technologies to check solutions</li> </ul>

Multiply and divide numbers mentally, drawing upon known facts			
Quest: Use known facts to multiply and divide			
Learning Journey	Steps	Content	Description
Using known facts to multiply	1	Representing and using known facts to multiply two 2-digit multiples of 10	<ul style="list-style-type: none"> <li>represent with models/diagrams and use known facts and place value understanding to multiply two 2-digit multiples of 10, eg using the known fact of <math>30 \times 4</math> to solve <math>30 \times 40</math> as <math>(30 \times 4) \times 10</math></li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• know that multiplying by 10 shifts the digits 1 place to the left</li> </ul>
	2	Representing and using known facts to multiply 2 multiples of 10 or 100	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to multiply 2 multiples of 10 or 100, eg using the known fact of <math>30 \times 4</math> to solve <math>30 \times 400</math> as <math>(30 \times 4) \times 100</math></li> <li>• know that multiplying by 10 shifts the digits 1 place to the left and multiplying by 100 shifts the digits 2 places to the left</li> </ul>
	3	Using known facts to multiply 1-digit numbers with multiples of 1,000	<ul style="list-style-type: none"> <li>• use known facts and place value understanding to solve multiplication problems with multiples of 1000, eg, <math>3 \times 6 = 18</math> so <math>3 \times 6,000 = 18,000</math></li> <li>• explain and justify the use of the strategy</li> </ul>
Using known facts to divide	1	Representing and using known facts to divide two 2-digit multiples of 10	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to divide two 2-digit multiples of 10, eg using the known fact of <math>60 \div 2 = 30</math> to solve <math>60 \div 20</math> as <math>(60 \div 2) \div 10</math></li> <li>• know that dividing by 10 shifts the digits 1 place to the right</li> </ul>
	2	Representing and using known facts to divide two 2-digit multiples of 10 or 100	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to divide two 2-digit multiples of 10, eg using the known fact of <math>600 \div 2 = 300</math> to solve <math>600 \div 20</math> as <math>(600 \div 2) \div 10</math></li> <li>• know that dividing by 10 shifts the digits 1 place to the right and dividing by 100 shifts the digits 2 places to the right</li> </ul>
	3	Using known facts divide 1-digit numbers with multiples of 1,000	<ul style="list-style-type: none"> <li>• use known facts and place value understanding to solve multiplication or division problems with multiples of 1,000, eg, <math>3 \times 6 = 18</math> so <math>3 \times 6,000 = 18,000</math></li> </ul>
Using known facts to multiply and divide	1	Representing and using known facts to multiply or divide two 2-digit multiples of 10	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to multiply or divide two 2-digit multiples of 10, eg using the known fact of <math>60 \div 2 = 30</math> to solve <math>60 \div 20</math> as <math>(60 \div 2) \div 10</math></li> <li>• know that dividing by 10 shifts the digits 1 place to the right</li> </ul>
	2	Representing and using known facts to multiply or divide two 2-digit multiples of 10 or 100	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to multiply or divide two 2-digit multiples of 10, eg using the known fact of <math>600 \div 2 = 300</math> to solve <math>600 \div 20</math> as <math>(600 \div 2) \div 10</math></li> </ul>

Learning Journey	Step	Content	Description
	3	Using known facts to solve multiplication and division problems with multiples of 10 and 100	<ul style="list-style-type: none"> <li>• know that dividing by 10 shifts the digits 1 place to the right and dividing by 100 shifts the digits 2 places to the right; know that multiplying by 10 shifts the digits 1 place to the left and multiplying by 100 shifts the digits 2 places to the left</li> </ul>
			<ul style="list-style-type: none"> <li>• use known facts and place value understanding to solve multiplication problems with multiples of 10 or 100, eg <math>3 \times 6 = 18</math> so <math>3 \times 600 = 1800</math></li> </ul>
			<ul style="list-style-type: none"> <li>• use known facts and place value understanding to solve division problems with multiples of 10 or 100, eg <math>18 \div 6 = 3</math> so <math>1800 \div 600 = 3</math></li> </ul>
			<ul style="list-style-type: none"> <li>• explain and justify the use of the strategy</li> </ul>

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context			
Quest: Divide up to 4-digit numbers			
Learning Journey	Steps	Content	Description
Dividing numbers up to 4-digit, no remainders	1	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 3-digit number by a 1-digit number, without remainders and without zeros in the answer</li> </ul>
	2	Dividing a 4-digit number by a 1-digit divisor using the contracted algorithm, no remainders or zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 4-digit number by a 1-digit number, without remainders and without zeros in the answer</li> </ul>
Introducing remainders in division problems	1	Introducing remainders in division problems	<ul style="list-style-type: none"> <li>• model division, including where the answer involves a remainder, using concrete materials</li> </ul>
			<ul style="list-style-type: none"> <li>• explain why a remainder is obtained in answers to some division problems</li> </ul>
			<ul style="list-style-type: none"> <li>• use mental strategies to divide a 2-digit number by a 1-digit number in problems for which answers include a remainder</li> </ul>
			<ul style="list-style-type: none"> <li>• record remainders to division problems in words</li> </ul>
			<ul style="list-style-type: none"> <li>• interpret the remainder in the context of a word problem</li> </ul>
Dividing numbers up to 4-digit, remainders	1	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 2-digit number by a 1-digit number, with remainders but without zeros in the answer</li> </ul>
	2	Dividing a 2-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 2-digit number by a 1-digit number, with and without remainders and zeros in the answer</li> </ul>

Learning Journey	Step	Content	Description
	3	Dividing a 3-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 3-digit number by a 1-digit number, with and without remainders and zeros in the answer</li> </ul>
	4	Dividing a 4-digit number by a 1-digit divisor using the contracted algorithm, with remainders but without zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 4-digit number by a 1-digit number, with remainders but without zeros in the answer</li> </ul>
	5	Dividing a 4-digit number by a 1-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide a 4-digit number by a 1-digit number, with and without remainders and zeros in the answer</li> </ul>

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000			
Quest: Multiply and divide by 10, 100 and 1,000			
Learning Journey	Steps	Content	Description
Multiplying whole numbers by 10, 100 and 1,000	1	Representing and using known facts to multiply 2-digit numbers by 100	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to multiply 2-digit numbers by 100, eg <math>13 \times 100 = 10 \times 100 + 3 \times 100</math></li> <li>• know that multiplying by 100 shifts the digits 2 places to the left</li> </ul>
	2	Comparing statements using $<$ , $>$ , or $=$ when multiplying by 10, 100 and 1,000	<ul style="list-style-type: none"> <li>• compare statements using <math>&lt;</math>, <math>&gt;</math> or <math>=</math> when multiplying by 10, 100 and 1,000 eg, <math>71 \times 1,000</math> [ ? ] <math>71 \times 100</math></li> </ul>
Dividing whole numbers by 10, 100 and 1,000	1	Representing and using known facts to divide 3-digit numbers by 10	<ul style="list-style-type: none"> <li>• represent with models/diagrams and use known facts and place value understanding to divide 2-digit numbers by 10, eg <math>460 \div 10 = 46</math></li> <li>• know that dividing by 10 shifts the digits 1 place to the right</li> </ul>
	2	Comparing statements when dividing by 10, 100 and 1,000 using inequality symbols	<ul style="list-style-type: none"> <li>• compare statements using <math>&lt;</math>, <math>&gt;</math> or <math>=</math> when dividing by 10, 100 and 1,000 , eg, <math>57,000 \div 10</math> [ ? ] <math>5,700 \div 100</math></li> </ul>
Multiplying decimals by 10, 100 and 1,000	1	Multiplying decimals by 10	<ul style="list-style-type: none"> <li>• use PV equipment to multiply decimals by 10</li> <li>• recognise that the digits move one place to the left</li> <li>• use zero as a place holder</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move 2 places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 100</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move three places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 1,000</li> </ul>
	2	Multiplying decimals by 100	<ul style="list-style-type: none"> <li>• recognise that the digits move 2 places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 100</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move 2 places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 100</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move three places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 1,000</li> </ul>
	3	Multiplying decimals by 1,000	<ul style="list-style-type: none"> <li>• recognise that the digits move three places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 1,000</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move three places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 1,000</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move three places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 1,000</li> </ul>

Learning Journey	Step	Content	Description
	4	Multiplying decimals by 10, 100, 1,000	<ul style="list-style-type: none"> <li>multiply decimals by 10, 100, 1,000</li> </ul>
Dividing decimals by 10, 100 and 1,000	1	Dividing decimals by 10	<ul style="list-style-type: none"> <li>recognise that the digits move one place the right</li> <li>use zero as a place holder</li> <li>use PV equipment to divide decimals by 10</li> </ul>
	2	Dividing decimals by 100	<ul style="list-style-type: none"> <li>recognise that the digits move 2 places to the right</li> <li>use zero as a place holder</li> <li>use PV equipment to divide decimals by 100</li> </ul>
	3	Dividing decimals by 1,000	<ul style="list-style-type: none"> <li>recognise that the digits move three places to the right</li> <li>use zero as a place holder</li> <li>use PV equipment to divide decimals by 1000</li> </ul>
	4	Dividing decimals by 10, 100, 1,000	<ul style="list-style-type: none"> <li>divide decimals by 10, 100, 1,000</li> </ul>

Recognise and use square numbers and cube numbers, and the notation for squared ( <sup>2</sup> ) and cubed ( <sup>3</sup> )			
Quest: Describe square & cube numbers			
Learning Journey	Steps	Content	Description
Introducing & describing square numbers	1	Describing square numbers	<ul style="list-style-type: none"> <li>model square numbers and record each number group in numerical and diagrammatic form</li> <li>explain how square numbers are created</li> <li>explore square numbers using arrays, grid paper or digital technologies</li> <li>recognise and explain the relationship between the name 'square' number and the way the pattern of numbers is created</li> </ul>
	2	Introducing square numbers	<ul style="list-style-type: none"> <li>establish and define the concept of square numbers, including the index notation</li> <li>generate square numbers up to at least 100</li> <li>know and recall square numbers up to and including 100</li> </ul>
Introducing & describing cube numbers	1	Describing cube numbers	<ul style="list-style-type: none"> <li>model cube numbers and record each number group in numerical and diagrammatic form</li> <li>explain how cube numbers are created</li> <li>explore cube numbers using cubes, grid paper or digital technologies</li> <li>recognise and explain the relationship between the name 'cube' number and the way the pattern of numbers is created</li> </ul>

Learning Journey	Step	Content	Description
	2	Introducing cube numbers	<ul style="list-style-type: none"> <li>establish and define the concept of cube numbers, including the index notation</li> <li>generate cube numbers up to at least 125</li> <li>know and recall cube numbers up to and including 125</li> </ul>

Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes

**Quest: Solve multiplication/division problems 1**

Learning Journey	Steps	Content	Description
Solving problems using factors and multiples	1	Solving problems using factors and multiples	<ul style="list-style-type: none"> <li>solve problems using knowledge of factors and multiples, eg 'There are 48 people at a party. In how many ways can you set up the tables and chairs, so that each table seats the same number of people and there are no empty chairs?'</li> </ul>
Comparing square and cube numbers	1	Comparing square and cube numbers using inequality symbols	<ul style="list-style-type: none"> <li>compare square and cube numbers using inequality symbols (<math>&lt;</math>, <math>&gt;</math>, <math>=</math>), eg, 3 cubed [ ? ] 4 squared</li> </ul>
Solving multiplication word problems	1	Solving multiplication word problems	<ul style="list-style-type: none"> <li>apply appropriate mental strategies to solve multiplication word problems</li> <li>apply appropriate written strategies to solve multiplication word problems</li> <li>apply appropriate digital technologies to solve multiplication word problems</li> <li>use the appropriate operation when solving problems in real-life situations</li> <li>use inverse operations to justify solutions</li> <li>record the strategy used to solve multiplication word problems</li> <li>use selected words to describe each step of the solution process</li> </ul>
Solving division word problems	1	Solving division word problems	<ul style="list-style-type: none"> <li>divide a number with 3 or more digits by a single-digit divisor</li> <li>solve a division problem with and without remainders</li> <li>use and interpret remainders in solutions to division problems</li> <li>recognise when division is required to solve word problems</li> <li>check answers to mental calculations using digital technologies</li> <li>use inverse operations to justify solutions to problems</li> </ul>



Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use estimation to check the reasonableness of answers to division calculations</li> </ul>

Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign

**Quest: Solve add/sub, mult/div problems**

Learning Journey	Steps	Content	Description
Using distributive properties	1	Multiplying by factorising (using the distributive property)	<ul style="list-style-type: none"> <li>• split factors, eg <math>50 \times 8</math> is the same as <math>50 \times 2 \times 4</math>, which becomes <math>100 \times 4</math></li> <li>• explain and justify the use of the strategy</li> </ul>
Solving missing number problems	1	Using equivalent number sentences that involve more than 1 operation to find unknown quantities	<ul style="list-style-type: none"> <li>• complete number sentences that involve more than 1 operation by calculating missing numbers, eg <math>5 \times ? = 4 \times 10</math>, <math>5 \times ? = 30 - 10</math></li> <li>• describe strategies for completing simple number sentences and justify solutions</li> <li>• check solutions to number sentences by substituting the solution into the original question</li> </ul>

Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

**Quest: Solve multiplication/division problems 2**

Learning Journey	Steps	Content	Description
Scaling by fractions	1	Interpreting multiplication of proper fractions as scaling	<ul style="list-style-type: none"> <li>• explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognising multiplication by whole numbers greater than 1 as a familiar case)</li> <li>• explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number</li> <li>• relate the principle of fraction equivalence <math>a/b = (n \times a)/(n \times b)</math> to the effect of multiplying <math>a/b</math> by 1</li> </ul>
Solving problems involving simple rates	1	Understanding that a rate, in simplest form, is the comparison of an amount per unit value of another	<ul style="list-style-type: none"> <li>• understand that a rate, in simplest form, is the comparison of an amount per unit value of another</li> </ul>

## 9.4 Fractions (including decimals and percentages)

Compare and order fractions whose denominators are all multiples of the same number			
Quest: Compare and order fractions			
Learning Journey	Steps	Content	Description
Comparing/ordering fractions, related denominators	1	Using common denominators to compare and order proper fractions with related denominators	<ul style="list-style-type: none"> <li>find a common denominator to compare fractions</li> <li>compare and order using <math>&lt;</math>, <math>&gt;</math>, <math>=</math></li> </ul>
	2	Comparing and ordering improper fractions whose denominators are all multiples of the same number (greater than 1) using models	<ul style="list-style-type: none"> <li>order simple improper fractions whose denominators are all multiples of the same number using models, eg bar models</li> <li>compare simple proper fractions whose denominators are all multiples of the same number using models, eg bar model</li> </ul>

Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths			
Quest: Investigate equivalent fractions			
Learning Journey	Steps	Content	Description
Investigating equivalent fractions	1	Investigating equivalent fractions up to and including 1 whole using area models (denominators 2, 4 and 8; 3 and 6; 5 and 10 and 100)	<ul style="list-style-type: none"> <li>model, compare and represent the equivalence of fractions with related denominators by redividing the whole, using identical area models fraction walls and bar models</li> </ul>

Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements $> 1$ as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ ]			
Quest: Recognise mixed numbers and improper fractions			
Learning Journey	Steps	Content	Description
Recognising mixed numbers	1	Introducing mixed numbers for fractions with denominators 2, 3, 4, 5, 6, 8	<ul style="list-style-type: none"> <li>use mixed numbers to describe models of fractions between 1 and 3; identify the wholes and fractional parts (no conversion from improper to proper fractions)</li> <li>identify and describe 'mixed numbers' as having a whole-number part and a fraction part</li> </ul>
Converting improper fractions and mixed numbers	1	Developing strategies to convert from improper fractions to mixed numbers using models and diagrams	<ul style="list-style-type: none"> <li>express improper fractions as mixed numbers through the use of diagrams and number lines</li> <li>develop strategies for converting between mixed numbers and improper fractions</li> <li>connect equivalent fractions <math>&gt; 1</math> to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions</li> </ul>

Learning Journey	Step	Content	Description
	2	Developing strategies to convert from mixed numbers to improper fractions using models and diagrams	<ul style="list-style-type: none"> <li>express mixed numbers as improper fractions through the use of diagrams and number lines</li> <li>develop strategies, including multiplication strategies for converting between mixed numbers and improper fractions</li> </ul>

Add and subtract fractions with the same denominator, and denominators that are multiples of the same number			
Quest: Add fractions			
Learning Journey	Steps	Content	Description
Adding fractions with the same denominator	1	Adding proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	<ul style="list-style-type: none"> <li>add proper fractions with the same denominator</li> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
Adding fractions with related denominators	1	Adding proper fractions with related denominators and answers less than 1 whole	<ul style="list-style-type: none"> <li>add proper fractions where the denominators are related</li> <li>model and represent strategies, including using diagrams and written representations</li> <li>use knowledge of equivalence to simplify answers when adding fractions</li> </ul>
Adding 3 or more fractions using models	1	Adding 3 or more fractions where the denominators are multiples using models	<ul style="list-style-type: none"> <li>add 3 or more fractions where the denominators are multiples using models eg, bar model</li> </ul>
Adding whole numbers & fractions	1	Adding a whole number and a proper fraction	<ul style="list-style-type: none"> <li>add a whole number and a proper fraction</li> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
Adding mixed numbers with the same denominator	1	Adding mixed numbers with the same denominator	<ul style="list-style-type: none"> <li>add mixed numbers with the same denominator</li> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
Quest: Subtract fractions			
Subtracting fractions with the same denominator	1	Subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	<ul style="list-style-type: none"> <li>subtract proper fractions with the same denominator</li> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
Subtracting fractions from a whole number, models	1	Subtracting fractions from 1 using models	<ul style="list-style-type: none"> <li>subtract fractions from one whole using models (part-whole, bar model, number line) eg, <math>1 - \frac{2}{8} =</math></li> </ul>
	2	Subtracting a proper fraction from a whole number	<ul style="list-style-type: none"> <li>use diagrams, and mental and written strategies, to subtract a proper fraction from any whole number including 1</li> <li>model and represent strategies, including using diagrams and written representations</li> </ul>

Learning Journey	Step	Content	Description
Subtracting fractions and mixed numbers	1	Subtracting fractions and mixed numbers with the same denominator	• use models to subtract 2 or more fractions and mixed numbers with the same denominator
			• subtract fractions and mixed numbers with the same denominator without models
			• solve problems involving subtracting fractions and mixed numbers with the same denominator
Subtracting mixed numbers: same denominator	1	Subtracting mixed numbers with the same denominator	• subtract mixed numbers with the same denominator
			• model and represent strategies, including using diagrams and written representations
Subtracting mixed numbers: related denominators	1	Subtracting mixed numbers with related denominators	• subtract mixed numbers with related denominators
Adding and subtracting fractions: same denominator	1	Adding and subtracting proper fractions with the same denominator (denominators 2, 3, 4, 5, 6, 7, 8)	• add and subtract proper fractions with the same denominator
			• model and represent strategies, including using diagrams and written representations

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams			
Quest: Multiply fractions by whole numbers			
Learning Journey	Steps	Content	Description
Multiplying fractions by whole numbers	1	Multiplying unit fractions by whole numbers using models and diagrams	• apply and extend previous understandings of multiplication to multiply a unit fraction by a whole number
			• use repeated addition to represent and multiply unit fractions by whole numbers, eg $\frac{1}{5} \times 3 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$
			• develop a rule for multiplying unit fractions by whole numbers, eg multiply the numerator by the whole number
			• solve word problems involving multiplication of unit fractions by whole numbers, including area and length problems
	2	Multiplying proper fractions by whole numbers using models and diagrams	• apply and extend previous understandings of multiplication to multiply a fraction by a whole number supported by models and/or diagrams, eg $\frac{2}{5} \times 3 = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5} = 1 \frac{1}{5}$
			• use repeated addition to multiply simple fractions by whole numbers, eg $\frac{2}{5} \times 3 = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5} = 1 \frac{1}{5}$
			• develop a rule for multiplying simple fractions by whole numbers, eg $\frac{2}{5} \times 3 = 2 \times 3 / 5 = \frac{6}{5} = 1 \frac{1}{5}$

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• solve word problems involving multiplication of fractions by whole numbers, including area and length problems</li> </ul>
	3	Using fractions as operators	<ul style="list-style-type: none"> <li>• link understanding of fractions of amounts and multiplying fractions to using fractions as operators</li> <li>• use knowledge of commutativity</li> </ul>
	4	Solving word problems involving fractions of a collection including mixed numbers, proper and im-	<ul style="list-style-type: none"> <li>• solve word problems involving a fraction of a collection/quantity</li> </ul>
<b>Quest: Multiply mixed numbers by whole numbers</b>			
Multiplying mixed numbers by whole numbers	1	Multiplying mixed numbers by whole numbers using models and diagrams	<ul style="list-style-type: none"> <li>• convert the mixed numbers to an improper fraction and then multiply by a whole number supported by models and/or diagrams, eg <math>1\frac{2}{3} \times 6</math> as <math>\frac{5}{3} \times 6 = \frac{30}{3}</math> or 10</li> </ul>
			<ul style="list-style-type: none"> <li>• solve word problems involving multiplication of fractions by whole numbers, including area and length problems</li> </ul>

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents			
<b>Quest: Introduce thousandths</b>			
Learning Journey	Steps	Content	Description
Introducing thousandths	1	Introducing decimal thousandths	<ul style="list-style-type: none"> <li>• recognise that the place value system can be extended beyond hundredths</li> </ul>
			<ul style="list-style-type: none"> <li>• express thousandths as decimals</li> </ul>
			<ul style="list-style-type: none"> <li>• interpret decimal notation for thousandths, eg, <math>0.123 = \frac{123}{1,000}</math></li> </ul>
			<ul style="list-style-type: none"> <li>• state the place value of digits in decimal numbers of up to 3 decimal places</li> </ul>
			<ul style="list-style-type: none"> <li>• model thousandths using concrete materials</li> </ul>
			<ul style="list-style-type: none"> <li>• represent decimal fractions, eg, as fractions (tenths, hundredths and thousandths), using concrete materials and in diagrams</li> </ul>

Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place			
<b>Quest: Round decimals</b>			
Learning Journey	Steps	Content	Description
Rounding decimals	1	Rounding decimal tenths and hundredths	<ul style="list-style-type: none"> <li>• round a number with 1 or 2 decimal places to the nearest whole number</li> </ul>
	2	Rounding decimal hundredths	<ul style="list-style-type: none"> <li>• round hundredths to the nearest whole number</li> </ul>
			<ul style="list-style-type: none"> <li>• round hundredths to the nearest tenth</li> </ul>

Read, write, order and compare numbers with up to 3 decimal places			
Quest: Order and compare decimals			
Learning Journey	Steps	Content	Description
Ordering/comparing decimals, up to 3 decimal places	1	Comparing and ordering decimal fractions of up to 3 decimal places	• place decimal numbers of up to 3 decimal places on a number line between 0 and 1
			• compare and order decimals with 3 decimal places using $>$ , $<$ and $=$
			• compare and order decimals with a different number of decimal places, up to 3 decimal places

Solve problems involving number up to 3 decimal places			
Quest: Add decimals			
Learning Journey	Steps	Content	Description
Adding decimals to 1 decimal place	1	Adding decimals to 1 decimal place using place value partitioning and models for support	• apply place value partitioning to add tenths and whole numbers or just tenths eg $3.4 + 5.2$ as $3 + 5$ and $4$ tenths + $2$ tenths
		Adding decimals to 1 decimal place using bridging to 10 and models for support	• apply bridging to 10 to add tenths and whole numbers or just tenths eg $3.8 + 0.5$ as $3.8 + 0.2 + 0.3$
	2	Adding decimals to 1 decimal place using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value
			• record strategies using numbers, models and diagrams
Adding decimals to 2 decimal places	1	Adding decimals to hundredths	• relate decimals to fractions to aid mental strategies
			• solve word problems using mental strategies, including problems involving measurement
			• add a whole number and a decimal (to hundredths)
			• add 2 decimal numbers in tenths
	2	Adding decimals to 2 decimal places using mental strategies	• add 2 decimal numbers in hundredths
			• add decimal numbers to 2 places (mixed place value)
			• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value
			• estimate sums
			• record strategies using numbers, models and diagrams
			• relate decimals to fractions to aid mental strategies
			• solve word problems using mental strategies, including problems involving measurement and money

Learning Journey	Step	Content	Description
Adding decimals to 3 decimal places	1	Adding decimals within 1 using models (up to 3 decimal places)	• add decimals within 1 using models (up to 3 decimal places) eg, split method
	2	Adding decimals beyond 1 using models (up to 3 decimal places)	• add decimals beyond 1 using models (up to 3 decimal places) eg, split method
	3	Adding a decimal number up to 3 decimal places to a whole number	• add a decimal number and whole numbers eg, $143.0 + 1.34$
	4	Adding decimals to 3 decimal places using mental strategies	• select and apply efficient mental strategies to solve addition problems, including compensation, bridging to 1, using place value
			• record strategies using numbers, models and diagrams
			• relate decimals to fractions to aid mental strategies
• solve word problems using mental strategies, including problems involving measurement and money			
Investigating decimal compliments to 1	1	Investigating decimal complements of 1	• use addition and subtraction to explore decimal complements of 1, eg $0.83 + 0.17 = 1$
Quest: Subtract decimals			
Subtracting decimals within 1	1	Subtracting decimals within 1 using models (up to 3 decimal places)	• subtract decimals within 1 while using models (up to 3 decimal places)
Subtracting decimals up to 3 decimal places	1	Subtracting decimals up to 3 decimal places with the same number of decimal places using place value partitioning and models	• apply place value partitioning to subtract decimals and whole numbers eg, $6.4 - 5.2$ as $6 - 5$ and 4 tenths + 2 tenths
	2	Subtracting decimals with 3 decimal places using bridging to 10 and models	• apply bridging to 10 to subtract decimals and whole numbers eg, $3.8 - 0.5$ as $3.8 - 0.2 - 0.3$
	3	Subtracting decimals with 3 decimal places using rounding and compensating and models	• apply rounding and compensating to subtract decimals and whole numbers eg, $9.9 - 5.2$ as $10 - 5.2 = 4.8$ , $4.8 - 0.1 = 4.7$
	4	Subtracting decimals in different place values	• subtract numbers with different numbers of decimal places eg, $4.543 - 2.34$
	5	Subtracting decimal numbers up to 3 decimal places from a whole number	• subtract decimal numbers from whole numbers eg, $12.0 - 1.3$
Quest: Identify decimal sequences			
Identifying & creating decimal sequences	1	Identifying and creating simple rules for decimal sequences	• identify and create simple rules for decimal sequences eg, add 0.15

Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal

**Quest: Introduce percentages**

Learning Journey	Steps	Content	Description
Introducing percentages	1	Introducing percentages	<ul style="list-style-type: none"> <li>• recognise that the symbol % means 'percent'</li> <li>• understand that 'percent' relates to 'number of parts per one hundred'</li> <li>• write fractions with a denominator of 100 as percentages and vice versa</li> <li>• model percentages with concrete materials/ drawings, eg using 10x10grid</li> <li>• identify real-life contexts where percentages are used</li> <li>• find a percent of a quantity as a rate per 100, eg 30% of a quantity means <math>\frac{30}{100}</math> times the quantity</li> </ul>

Solve problems which require knowing percentage and decimal equivalents of  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{4}{5}$  and those fractions with a denominator of a multiple of 10 or 25

**Quest: Solve percentage equivalence problems**

Learning Journey	Steps	Content	Description
Converting common fractions to percentages	1	Converting common fractions to percentages using mental strategies	<ul style="list-style-type: none"> <li>• use mental strategies to convert fractions to percentages</li> </ul>



## 10 Measurement

### 10.1 Measurement

Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]			
Quest: Convert units of mass			
Learning Journey	Steps	Content	Description
Converting between kilograms and grams	1	Converting between grams and kilograms (whole numbers only)	● describe 1 gram as $\frac{1}{1,000}$ of a kilo-gram
			● apply place value understanding to modelling, describing and recording metric units of measurement
			● convert between grams and kilo-grams using whole numbers and record measurement equivalents in a two-column table
			● explain the relationship between the size of a unit and the number of units needed
			● convert between mass written in grams and mixed units (kg and g), eg, 1,250g = 1 kg 250g or 7kg 320g = 7,320g
Quest: Convert units of length			
Converting between m, cm & mm	1	Converting between centimetres and millimetres (mixed numbers and fractions)	● convert between centimetres and millimetres using mixed numbers and fractions
	2	Converting between metres and millimetres (whole numbers only)	● describe 1 metre as 1,000 millime-tres
			● convert between millimetres and metres using whole numbers and record measurement equivalents in a two-column table
			● explain the relationship between the size of a unit and the number of units needed
	Quest: Convert units of capacity		
Converting between litres & millilitres	1	Converting between units of vol-ume and capacity (whole num-bers only)	● convert between millilitres and litres using whole numbers and record measurement equivalents in a two-column table
	2	Converting between standard metric units of volume and ca-pacity with whole numbers and fractions	● understand the meaning of metric prefixes, eg milli- ● convert between millilitres and litres and vice versa, including using halves and quarters of litres

Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints			
Quest: Convert between metric & imperial units			
Learning Journey	Steps	Content	Description
Converting between metric and imperial (length)	1	Converting informally between metric and imperial units of length	<ul style="list-style-type: none"> <li>understand and use approximate equivalences between metric units and common imperial units such as centimetres and inches, feet and metres, kilometres and miles</li> </ul>
	2	Converting between imperial and metric units of length (inches and centimetres)	<ul style="list-style-type: none"> <li>convert between imperial and metric units of length (inches and centimetres) including real-world examples</li> </ul>
Converting between metric and imperial (capacity)	1	Converting informally between metric and customary units of volume and capacity	<ul style="list-style-type: none"> <li>understand and use approximate equivalences between metric units and common customary units such as litres and pints</li> </ul>

Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres			
Quest: Calculate perimeter			
Learning Journey	Steps	Content	Description
Calculating perimeter	1	Introducing perimeter	<ul style="list-style-type: none"> <li>use the term 'perimeter' to describe the total distance around a 2D shape</li> </ul>
			<ul style="list-style-type: none"> <li>estimate and measure the perimeters of 2D shapes</li> </ul>
			<ul style="list-style-type: none"> <li>describe when a perimeter measurement might be used in everyday situations</li> </ul>
	2	Calculating the perimeters of rectangles	<ul style="list-style-type: none"> <li>use the term 'dimensions' to describe the 'lengths' and 'widths' of rectangles and squares</li> </ul>
			<ul style="list-style-type: none"> <li>measure and calculate the perimeter of a large rectangular section of the school</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that rectangles with the same perimeter may have different dimensions</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that rectangles with dimensions given in different units may have the same perimeter</li> </ul>
			<ul style="list-style-type: none"> <li>explore different methods of finding the perimeter of rectangles</li> </ul>
			<ul style="list-style-type: none"> <li>create a rule to find the perimeter of any rectangle</li> </ul>
	3	Calculating the side length of a rectangle given the perimeter	<ul style="list-style-type: none"> <li>find the length of 1 unknown side of a rectangle given the perimeter</li> </ul>
			<ul style="list-style-type: none"> <li>find possible length combinations of 2 unknown sides of a rectangle given the perimeter</li> </ul>
	4	Calculating the perimeters of composite rectilinear shapes	<ul style="list-style-type: none"> <li>explain that the perimeters of composite rectilinear shapes can be determined by calculating the sum of all the side lengths</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• calculate the lengths of any unknown side lengths using lengths of other sides</li> </ul>
			<ul style="list-style-type: none"> <li>• record calculations used to find the perimeters of composite rectilinear shapes</li> </ul>

Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm <sup>2</sup> ) and square metres (m <sup>2</sup> ), and estimate the area of irregular shapes			
Quest: Calculate and compare area			
Learning Journey	Steps	Content	Description
Introducing the square centimetre and square metre	1	Introducing formal units for area: the square centimetre	<ul style="list-style-type: none"> <li>• establish the need for a formal unit to measure area and introduce square centimetres</li> </ul>
			<ul style="list-style-type: none"> <li>• develop a sense of the area of 1 square centimetre and identify surfaces that have area 'about 1 square centimetre', 'less than 1 square centimetre' and 'greater than 1 square centimetre'</li> </ul>
			<ul style="list-style-type: none"> <li>• identify everyday situations where square centimetres are an appropriate unit for measuring area</li> </ul>
			<ul style="list-style-type: none"> <li>• introduce the abbreviation cm<sup>2</sup> for recording area in square centimetre</li> </ul>
	2	Introducing formal units for area: the square metre	<ul style="list-style-type: none"> <li>• recognise the need for a larger formal unit to measure area and introduce square metres</li> </ul>
			<ul style="list-style-type: none"> <li>• develop a sense of the area of 1 square metre and identify surfaces that have area 'about 1 square metre', 'less than 1 square metre' and 'greater than 1 square metre'</li> </ul>
			<ul style="list-style-type: none"> <li>• identify everyday situations where square metres are an appropriate unit for measuring the area, eg floor of a room</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that a square metre need not be square in shape, eg cut a piece of cardboard that is 1 metre by 1 metre in half and join the shorter ends to make an area that is 2 metres by half a metre</li> </ul>
Comparing and ordering areas	1	Comparing and ordering rectangular areas using counting of standard metric units	<ul style="list-style-type: none"> <li>• compare two areas by measuring using standard metric units</li> </ul>
			<ul style="list-style-type: none"> <li>• order three or more areas by measuring using standard metric units</li> </ul>
			<ul style="list-style-type: none"> <li>• choose the most appropriate unit cm<sup>2</sup> or m<sup>2</sup> and justify selection</li> </ul>
Estimating and comparing areas of irregular shapes	1	Estimating and comparing areas of non-rectilinear shapes using a square grid	<ul style="list-style-type: none"> <li>• use a square grid to approximate and compare the areas of non-rectilinear shapes</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• compare how different placements of the grid make approximation easier or more difficult</li> </ul>
			<ul style="list-style-type: none"> <li>• find and explain the area of irregular shapes by counting squares or part squares</li> </ul>
	2	Approximating and comparing areas of non-rectilinear shapes using a square centimetre grid	<ul style="list-style-type: none"> <li>• use a square-centimetre grid to approximate and compare the areas of non-rectilinear shapes</li> </ul>
			<ul style="list-style-type: none"> <li>• compare how different placements of the grid make approximation easier or more difficult</li> <li>• find and explain the area of irregular shapes by counting squares or part squares</li> </ul>
Calculating the area of a rectangle	1	Developing an additive formula for area of a rectangle	<ul style="list-style-type: none"> <li>• connect arrays with side lengths through repeated addition leading to multiplication</li> </ul>
	2	Developing a multiplicative formula for area of a rectangle using metric units	<ul style="list-style-type: none"> <li>• connect the area of a rectangle to the multiplication of its side lengths and develop a formula (in words) for the area of a rectangle, eg Area of rectangle = length x width</li> </ul>
			<ul style="list-style-type: none"> <li>• calculate the area of a rectangle by multiplying the length and width of the rectangle</li> </ul>
			<ul style="list-style-type: none"> <li>• calculate a side length of the rectangle given its area and one other side length</li> </ul>
			<ul style="list-style-type: none"> <li>• explain methods for finding the area of a square as a type of rectangle; connect multiplying equal sides to the concept of square numbers</li> </ul>

Estimate volume [for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)] and capacity [for example, using water]

#### Quest: Estimate capacity

Learning Journey	Steps	Content	Description
Estimating and comparing capacity	1	Estimating, comparing and measuring in litres	<ul style="list-style-type: none"> <li>• estimate and measure capacities to the nearest litre</li> </ul>
			<ul style="list-style-type: none"> <li>• compare and order 2 or more containers by capacity measured in litres, including the capacity of commercially packaged objects whose capacity is stated in litres</li> </ul>
	2	Estimating, comparing and measuring in mixed units of volume (l and ml)	<ul style="list-style-type: none"> <li>• record volumes and capacities using the abbreviation for litres (l)</li> <li>• estimate and measure capacities to the nearest litre and millilitre</li> </ul>

Learning Journey	Step	Content	Description
<b>Quest: Estimate volume</b>			
Estimating volume using 1 cm <sup>3</sup> blocks	1	Estimating and measuring volume using cubic centimetre blocks	<ul style="list-style-type: none"> <li>• use the cubic centimetre as a unit to measure volumes by packing small containers with cubic centimetre blocks and describing in terms of layers, eg, '2 layers of 10 cubic centimetre blocks'</li> </ul>
			<ul style="list-style-type: none"> <li>• construct 3D shapes using cubic centimetre blocks and count the blocks to determine the volumes of the objects; devise and explain strategies for counting blocks</li> </ul>
			<ul style="list-style-type: none"> <li>• compare the volumes of 2 or more objects made from cubic centimetre blocks by counting blocks</li> </ul>
			<ul style="list-style-type: none"> <li>• record volumes using the abbreviation for cubic centimetres (cm<sup>3</sup>)</li> </ul>

Solve problems involving converting between units of time			
<b>Quest: Convert units of time</b>			
Learning Journey	Steps	Content	Description
Converting units of time	1	Converting between hours, minutes and seconds (whole numbers only)	<ul style="list-style-type: none"> <li>• convert between hours and minutes and vice versa (whole numbers only)</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between minutes and seconds and vice versa (whole numbers only)</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between hours, minutes and seconds using whole numbers and record measurement equivalents in a two-column table</li> </ul>
	2	Converting between hours, minutes and seconds (including quarter and half hours and minutes)	<ul style="list-style-type: none"> <li>• convert between hours and minutes and vice versa, including quarter-hour, half-hour and three-quarter-hour conversions</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between minutes and seconds and vice versa, including quarter minute, half minute, and three-quarter minute conversions</li> </ul>
	3	Converting between units of time (including quarter and half hours and minutes)	<ul style="list-style-type: none"> <li>• convert between weeks and days (whole number of weeks only)</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between months and years (whole number of years only)</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between all units of time using whole numbers and record measurement equivalents in a two-column table</li> </ul>

Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling

**Quest: Solve measure problems with decimals**

Learning Journey	Steps	Content	Description
Equivalent measures to 3 decimal places	1	Connecting decimal representations to the metric system	<ul style="list-style-type: none"> <li>• recognise the equivalence of whole-number and decimal representations of measurements of length</li> <li>• interpret decimal notation for lengths and distances involving millimetres, centimetres, metres and kilometres</li> </ul>
	2	Converting between metric units of mass up to 3 decimal places using knowledge of multiplying and dividing by 10, 100 and 1,000	<ul style="list-style-type: none"> <li>• convert between measures of length, mass and capacity using a table</li> </ul>
Comparing/ordering units of mass to 3 dp	1	Comparing mixed metric units of mass up to 3 decimal places	<ul style="list-style-type: none"> <li>• compare measures of length, mass and capacity</li> </ul>
	2	Ordering mixed metric units of mass up to 3 decimal places	<ul style="list-style-type: none"> <li>• order measures of length, mass and capacity</li> </ul>
Solving money problems, multiplication & division	1	Using money: Multiplication and division problems	<ul style="list-style-type: none"> <li>• use multiplication and division to solve a variety of problems involving money and record the value using a decimal point and the symbol £</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation to check the reasonableness of solutions to problems involving purchases and calculation of change</li> </ul>

# 11 Geometry

## 11.1 Properties of shapes

Identify 3-D shapes, including cubes and other cuboids, from 2-D representations			
Quest: Identify 3-D shapes from 2-D representations			
Learning Journey	Steps	Content	Description
Connecting nets of 3-D shapes	1	Introducing nets of prisms	<ul style="list-style-type: none"> <li>draw and describe nets for rectangular and triangular prisms</li> </ul>
	2	Connecting prisms and pyramids with their nets	<ul style="list-style-type: none"> <li>examine a diagram to determine whether it is or is not the net of a prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>explain why a given net will not form a prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>visualise and sketch nets for a given prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>recognise whether a diagram is a net of a particular prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>visualise and name prisms and pyramids, given diagrams of their nets</li> </ul>
			<ul style="list-style-type: none"> <li>select the correct diagram of a net for a given prism or pyramid from a group of similar diagrams where the others are not valid nets of the object</li> </ul>
	3	Connecting 3D shapes with their nets	<ul style="list-style-type: none"> <li>examine a diagram to determine whether it is or is not the net of a closed 3D shape</li> </ul>
			<ul style="list-style-type: none"> <li>explain why a given net will not form a closed 3D shape</li> </ul>
			<ul style="list-style-type: none"> <li>visualise and sketch nets for given 3D shapes</li> </ul>
			<ul style="list-style-type: none"> <li>recognise whether a diagram is a net of a particular 3D shape</li> </ul>
			<ul style="list-style-type: none"> <li>visualise and name prisms and pyramids, given diagrams of their nets</li> </ul>
			<ul style="list-style-type: none"> <li>select the correct diagram of a net for a given 3D shape (include other regular polyhedrons)</li> </ul>

Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles			
Quest: Compare angles			
Learning Journey	Steps	Content	Description
Comparing angles	1	Comparing and ordering angles in a shape using statements and inequality symbols	<ul style="list-style-type: none"> <li>compare and order angles using statements and inequality symbols, eg Angle A is [ &lt;, &gt; or = ] Angle B</li> </ul>

Draw given angles, and measure them in degrees (°)			
Quest: Measure angles			
Learning Journey	Steps	Content	Description
Measuring angles	1	Measuring and estimating angles of up to 180° in degrees	<ul style="list-style-type: none"> <li>• measure angles of up to 180° using a protractor</li> </ul>
			<ul style="list-style-type: none"> <li>• estimate angles of up to 180° and check by measuring</li> </ul>

Identify: <ul style="list-style-type: none"> <li>• angles at a point and 1 whole turn (total 360°)</li> <li>• angles at a point on a straight line and half a turn (total 180°)               <ul style="list-style-type: none"> <li>• other multiples of 90°</li> </ul> </li> <li>• use the properties of rectangles to deduce related facts and find missing lengths and angles</li> <li>• distinguish between regular and irregular polygons based on reasoning about equal sides and angles</li> </ul>			
Quest: Classify angles			
Learning Journey	Steps	Content	Description
Classifying angles	1	Classifying angles as acute, right, obtuse, straight, reflex or a revolution	<ul style="list-style-type: none"> <li>• understand and describe angles greater than or equal to 180°</li> <li>• identify and name angles as acute, right, obtuse, straight, reflex and revolution</li> <li>• categorise angles as acute, right, obtuse, straight, reflex and revolution</li> <li>• draw and create angles of a given size: acute, right, obtuse, straight, reflex and revolution (no protractors)</li> </ul>
	2	Classifying angles by their size in degrees	<ul style="list-style-type: none"> <li>• connect the term 'right angle' with 90°, 'straight angle' with 180° and 'angle of revolution' with 360°</li> <li>• establish and recall the angle size in degrees for each of the classifications: acute, obtuse and reflex</li> <li>• classify angles with a specified size in degrees as acute, right, obtuse, straight, reflex or a revolution</li> <li>• draw angles that are acute, right, obtuse, straight, reflex or a revolution using a ruler only</li> </ul>
Quest: Classify quadrilaterals			
Classifying quadrilaterals	1	Classifying quadrilaterals using a variety of strategies	<ul style="list-style-type: none"> <li>• classify 2D shapes in a hierarchy based on properties</li> <li>• interpret a hierarchy diagram of 2D shapes and their properties</li> <li>• use Venn diagrams to record classifications</li> <li>• interpret classifications represented using Venn diagrams</li> </ul>
Quest: Identify regular & irregular polygons			
Identifying regular & irregular polygons	1	Sorting among polygons, regular polygons and other 2D shapes	<ul style="list-style-type: none"> <li>• explain the difference between regular and irregular shapes</li> <li>• identify 2D shapes that are not polygons</li> </ul>



## 11.2 Position and direction

Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed			
Quest: Reflections and translations			
Learning Journey	Steps	Content	Description
Reflections with coordinates	1	Identifying 2D reflections on a grid or coordinate grid (first quadrant only)	<ul style="list-style-type: none"> <li>• identify 2D shapes in diagrams and on coordinate grid</li> </ul>
	2	Plotting reflections of shapes and points on a coordinate grid	<ul style="list-style-type: none"> <li>• plot reflections of shapes and points on a coordinate grid</li> </ul>
	3	Recording the positions of reflected points using coordinates	<ul style="list-style-type: none"> <li>• record the positions of reflected points using coordinates eg, (3,5)</li> </ul>
Translations with coordinates	1	Investigating translations in the first quadrant	<ul style="list-style-type: none"> <li>• identify the one-step transformation used to move a shape from 1 position to another</li> </ul>
			<ul style="list-style-type: none"> <li>• follow instructions to position a shape on a grid</li> </ul>
			<ul style="list-style-type: none"> <li>• identify the instructions required to translate a shape on a grid using suitable language such as left/right, up/down, number of squares moved</li> </ul>
	2	Translating coordinates in the first quadrant	<ul style="list-style-type: none"> <li>• record the new position of a coordinate after translation</li> </ul>
			<ul style="list-style-type: none"> <li>• describe the translation of coordinates</li> </ul>

## 12 Statistics

### 12.1 Statistics

Solve comparison, sum and difference problems using information presented in a line graph			
Quest: Solve problems using line graphs			
Learning Journey	Steps	Content	Description
Solving problems using line graphs	1	Representing and reading data in a given line graph	<ul style="list-style-type: none"> <li>complete a line graph using a given data set</li> <li>answer and ask questions relating to data in a line graph including sum, comparison and difference questions</li> </ul>
	2	Interpreting primary and secondary data in a line graph	<ul style="list-style-type: none"> <li>interpret line graphs using the scales on the axes</li> <li>describe and interpret data presented in line graphs</li> <li>identify and describe relationships that can be observed in data displays</li> </ul>

Complete, read and interpret information in tables, including timetables			
Quest: Solve problems with tables			
Learning Journey	Steps	Content	Description
Reading and interpreting data in tables	1	Interpreting data and solving problems using data in tables	<ul style="list-style-type: none"> <li>describe and interpret data presented in tables, eg maximum and minimum values; total number of responses; differences between values</li> <li>identify and describe relationships; draw conclusions and ask questions</li> <li>interpret data presented in two-way tables that represent two categorical variables</li> <li>ask and answer comparative and relational questions related to data in a two-way table</li> </ul>
Representing bivariate data in two-way tables	1	Representing bivariate data in a two-way table	<ul style="list-style-type: none"> <li>create a two-way table to organise data involving 2 categorical variables</li> <li>ask and answer comparative and relational questions related to data in a two-way table</li> </ul>
Using timetables	1	Using timetables (12-hour time)	<ul style="list-style-type: none"> <li>use real-world timetables (12-hour time only) to determine arrival time given the desired departure time, including when the exact departure time is not listed exactly in the timetable, ie needing to use an earlier departure time</li> <li>use real-world timetables (12-hour time only) to determine departure time given the desired arrival time, including when the arrival time is not listed exactly in the timetable</li> <li>create timetables using given information</li> </ul>

Learning Journey	Step	Content	Description
	2	Using timetables (12-hour and 24-hour time)	<ul style="list-style-type: none"> <li>• use real-world timetables (12-hour and 24-hour time) to determine arrival time given the desired departure time, including when the departure time is not listed exactly in the timetable</li> </ul>
			<ul style="list-style-type: none"> <li>• use real-world timetables (12-hour and 24-hour time) to determine departure time given the desired arrival time, including when the arrival time is not listed exactly in the timetable</li> </ul>
			<ul style="list-style-type: none"> <li>• use real-world timetables (12-hour and 24-hour time) to determine the duration of a journey</li> </ul>
			<ul style="list-style-type: none"> <li>• solve real-world problems involving timetables</li> </ul>

## Part IV

# Year 6

## 13 Number

### 13.1 Number and place value

Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit			
Quest: Read and write numbers to 10,000,000			
Learning Journey	Steps	Content	Description
Reading and writing numbers to 10,000,000	1	Reading and writing numbers to 10 million	<ul style="list-style-type: none"> <li>• apply an understanding of place value to read numbers to 10 million</li> <li>• apply an understanding of place value to write numbers to 10 million</li> </ul>
Identifying place value up to 10,000,000	1	Naming the place value for a digit in a number	<ul style="list-style-type: none"> <li>• name the place value for an underlined digit in a number</li> <li>• identify the value of an underlined digit in a number</li> </ul>
	2	Identifying the place value of digits in numbers up to 10 million	<ul style="list-style-type: none"> <li>• state the place value of digits in numbers of up to 10 million</li> <li>• pose and answer questions that extend place value understanding of numbers, eg 'What happens if I rearrange the digits in the number 12,345,678?', 'How can I rearrange the digits to make the largest number?'</li> </ul>
			<ul style="list-style-type: none"> <li>• represent and describe whole numbers to 10,000,000 pictorially and symbolically</li> </ul>
Using place value to partition 7-digit numbers	1	Using place value to partition 7-digit numbers	<ul style="list-style-type: none"> <li>• use place value to partition numbers of up to 7 digits, eg, 4,673,012 is <math>4,000,000 + 600,000 + 70,000 + 3,000 + 10 + 2</math></li> </ul>
	2	Using non-standard partitioning with 7-digit numbers	<ul style="list-style-type: none"> <li>• partition numbers of up to 7 digits in non-standard forms, eg, 5,617,000 as <math>5,500,000 + 117,000</math></li> </ul>
Comparing and ordering numbers to 10,000,000	1	Comparing 7-digit numbers	<ul style="list-style-type: none"> <li>• compare 7-digit numbers using words and symbols <math>&lt;</math>, <math>=</math>, <math>&gt;</math></li> <li>• arrange 7-digit numbers in ascending and descending order</li> </ul>
		Ordering numbers of any size	<ul style="list-style-type: none"> <li>• arrange numbers of any size in ascending and descending order</li> </ul>

Round any whole number to a required degree of accuracy			
Quest: Round numbers of any size			
Learning Journey	Steps	Content	Description
Rounding numbers of any size	1	Rounding numbers to the nearest 10,000, 100,000 or 1,000,000	<ul style="list-style-type: none"> <li>• round to the nearest 10,000, 100,000 or 1,000,000 with and without models (place value grids, number lines)</li> </ul>

Learning Journey	Step	Content	Description
	2	Rounding numbers to a specified place value	<ul style="list-style-type: none"> <li>round numbers to a specified place value, eg round 5,461,883 to the nearest million</li> </ul>

Use negative numbers in context, and calculate intervals across 0			
Quest: Positive & negative numbers in context			
Learning Journey	Steps	Content	Description
Positive and negative numbers in context	1	Interpreting negative integers in context	<ul style="list-style-type: none"> <li>interpret negative integers in context eg, difference in temperature, or when finding the difference between two numbers, or halfway point</li> </ul>
	2	Interpreting integers in context	<ul style="list-style-type: none"> <li>use a model to interpret intervals across zero (in context)</li> </ul>

## 13.2 Addition, subtraction, multiplication and division

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication			
Quest: Multiply multi-digit numbers			
Learning Journey	Steps	Content	Description
Multiplying 3-digits by 2-digits: expanded form	1	Multiplying 3-digit numbers by 2-digit numbers using the extended form of the formal algorithm	• multiply 3-digit by 2-digit numbers using extended form, with and without regrouping
			• check answers to mental calculations using digital technologies
			• use inverse operations to justify solutions
Multiplying 4-digits by 2-digits: algorithm	1	Multiplying 4-digit numbers by 2-digit numbers using the contracted algorithm, without regrouping (regrouping only when adding the partial products)	• multiply the ones, then the tens, then the hundreds and then the thousands, without regrouping
			• check if a calculation is correct
	2	Multiplying 4-digit numbers by 2-digit numbers using the contracted algorithm	• multiply the ones, then the tens, then the hundreds and then the thousands, with and without regrouping • use inverse operations or digital technologies to check solutions

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context			
Quest: Divide by 2-digits, long division			
Learning Journey	Steps	Content	Description
Dividing by 2-digits, expanded form: long division	1	Dividing a 3-digit number by a 2-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 3-digit number by a 2-digit number, without remainders and without zeros in the answer
	2	Dividing a 4-digit number by a 2-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 4-digit number by a 2-digit number, without remainders and without zeros in the answer
Dividing by 2-digits, algorithm (long division)	1	Dividing a 3-digit number by a 2-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 3-digit number by a 2-digit number, without remainders and without zeros in the answer
	2	Dividing a 4-digit number by a 2-digit divisor using the extended algorithm, no remainders or zeros in answers	• apply the written algorithm to divide a 4-digit number by a 2-digit number, without remainders and without zeros in the answer
	3	Dividing up to a 4-digit number by a 2-digit divisor using the contracted algorithm, with remainders but without zeros in answers	• apply the written algorithm to divide up to a 4-digit number by a 2-digit number, with remainders and without zeros in the answer
	4	Dividing up to a 4-digit number by a 2-digit divisor using the contracted algorithm, with and without remainders and zeros in answers	• apply the written algorithm to divide up to a 4-digit number by a 2-digit number, with and without remainders and zeros in the answer

Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

**Quest: Divide by 2-digits, short division**

Learning Journey	Steps	Content	Description
Dividing by 2-digits, algorithm (short division)	1	Dividing up to a 4-digit number by a 2-digit divisor using the contracted algorithm, no remainders or zeroes in the answer	<ul style="list-style-type: none"> <li>• apply the written algorithm to divide up to a 4-digit number by a 2-digit number</li> </ul>

Perform mental calculations, including with mixed operations and large numbers

**Quest: Perform mental calculations**

Learning Journey	Steps	Content	Description
Applying strategies for addition and subtraction	1	Applying efficient strategies for addition and subtraction calculations involving numbers of any size	<ul style="list-style-type: none"> <li>• add 3 or more numbers with different numbers of digits</li> </ul>
			<ul style="list-style-type: none"> <li>• use mental and/or written strategies efficiently</li> </ul>
			<ul style="list-style-type: none"> <li>• use mathematical language to describe addition and subtraction strategies</li> </ul>
			<ul style="list-style-type: none"> <li>• apply efficient strategies to solve word problems involving addition and subtraction</li> </ul>
			<ul style="list-style-type: none"> <li>• represent calculations using appropriate recording strategies</li> </ul>
			<ul style="list-style-type: none"> <li>• justify the choice of strategy for a given calculation</li> </ul>

Identify common factors, common multiples and prime numbers

**Quest: Identify common factors/multiples/primes**

Learning Journey	Steps	Content	Description
Identifying prime and composite numbers	1	Identifying prime and composite numbers	<ul style="list-style-type: none"> <li>• determine whether a number is prime, composite or neither</li> <li>• explain whether a whole number is prime, composite or neither by finding the number of factors, eg '13 has two factors (1 and 13) and therefore is prime', '21 has more than two factors (1, 3, 7, 21) and therefore is composite', '1 is neither prime nor composite as it has only one factor, itself'</li> </ul>
Finding common factors for two numbers	1	Finding common factors for two numbers	<ul style="list-style-type: none"> <li>• find common factors for two numbers</li> </ul>
Finding multiples up to 144	1	Finding multiples up to 144	<ul style="list-style-type: none"> <li>• determine 'multiples' of a given whole number</li> <li>• determine the 'lowest common multiple' (LCM) of 2 whole numbers</li> </ul>

Use their knowledge of the order of operations to carry out calculations involving the 4 operations			
Quest: Introduce order of operations			
Learning Journey	Steps	Content	Description
Introducing order of operations	1	Introducing order of operations involving addition and subtraction	<ul style="list-style-type: none"> <li>• solve number sentences involving addition and subtraction</li> </ul>
	2	Introducing order of operations involving multiplication and division	<ul style="list-style-type: none"> <li>• solve number sentences involving multiplication and division</li> </ul>
	3	Introducing order of operations involving all 4 operations	<ul style="list-style-type: none"> <li>• solve number sentences involving all 4 operations</li> </ul>
Grouping symbols in order of operations	1	Introducing order of operations involving grouping symbols	<ul style="list-style-type: none"> <li>• explore the use of brackets and the order of operations in number sentences</li> </ul>
			<ul style="list-style-type: none"> <li>• use the term 'operations' to describe collectively the processes of addition, subtraction, multiplication and division</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the grouping symbols () and [] are used in number sentences to indicate operations that must be performed first</li> </ul>
			<ul style="list-style-type: none"> <li>• perform calculations involving grouping symbols without the use of digital technologies</li> </ul>
	2	Applying order of operations for mixed operations and grouping symbols	<ul style="list-style-type: none"> <li>• apply the order of operations to perform calculations involving mixed operations and grouping symbols</li> </ul>
			<ul style="list-style-type: none"> <li>• investigate whether different digital technologies apply the order of operations</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise when grouping symbols are not necessary</li> </ul>

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why			
Quest: Solve add/sub multi-step problems			
Learning Journey	Steps	Content	Description
Solving add/sub word problems	1	Solving addition word problems involving numbers of any size	<ul style="list-style-type: none"> <li>• select and apply efficient mental strategies to solve word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• select and apply efficient written strategies to solve word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• use a calculator to solve word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• interpret words that indicate the required operation</li> </ul>
			<ul style="list-style-type: none"> <li>• justify the choice of strategy for a given calculation</li> </ul>
	2	Solving subtraction word problems involving decimals to hundredths (inclusive)	<ul style="list-style-type: none"> <li>• select and apply efficient mental strategies to solve word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• select and apply efficient written strategies to solve word problems</li> </ul>



Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use a calculator to solve word problems</li> <li>• interpret words that indicate the required operation</li> <li>• justify the choice of strategy for a given calculation</li> </ul>
	3	Solving word problems requiring both addition and subtraction involving numbers of any size	<ul style="list-style-type: none"> <li>• select and apply efficient mental strategies to solve word problems</li> <li>• select and apply efficient written strategies to solve word problems</li> <li>• justify the use digital technologies to solve word problems</li> </ul>
			<ul style="list-style-type: none"> <li>• interpret words that indicate the required operation/s</li> <li>• justify the choice of strategy for a given calculation</li> </ul>

Solve problems involving addition, subtraction, multiplication and division			
Quest: Solve problems with the 4 operations			
Learning Journey	Steps	Content	Description
Solving multiplication and division word problems	1	Solving word problems involving multiplication and division	<ul style="list-style-type: none"> <li>• use appropriate language to compare quantities, eg 'twice as much', 'half as much'</li> <li>• use a table or similar organiser to record methods used to solve problems</li> </ul>
Solving addition and subtraction word problems	1	Solving addition and subtraction two-step problems in context (max sum 10,000)	<ul style="list-style-type: none"> <li>• read and interpret a word problem</li> <li>• decide with operations and strategies to use and explain why</li> <li>• solve an addition and subtraction two-step problem</li> </ul>

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy			
Quest: Check the accuracy of calculations			
Learning Journey	Steps	Content	Description
Rounding to estimate quotients Checking accuracy, addition/subtraction	1	Rounding to estimate quotients	<ul style="list-style-type: none"> <li>• estimate quotients using rounding</li> </ul>
	1	Checking accuracy of addition and subtraction calculations	<ul style="list-style-type: none"> <li>• check solutions to problems by using the inverse operation</li> <li>• round numbers appropriately when obtaining estimates to numerical calculations</li> <li>• use estimation to check the reasonableness of answers to addition and subtraction calculations</li> </ul>
	2	Checking accuracy of addition and subtraction calculations with 4-digit and 5-digit numbers	<ul style="list-style-type: none"> <li>• check solutions to problems by using the inverse operation</li> <li>• round numbers appropriately when obtaining estimates to numerical calculations</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use estimation to check the reasonableness of answers to addition and subtraction calculations</li> </ul>
Rounding to estimate products	1	Rounding to estimate products	<ul style="list-style-type: none"> <li>• estimate products by rounding</li> </ul>

### 13.3 Fractions (including decimals and percentages)

Use common factors to simplify fractions; use common multiples to express fractions in the same denomination			
Quest: Use common factors and multiples			
Learning Journey	Steps	Content	Description
Equivalent simple fractions, related denominators	1	Recognizing and finding equivalent simple fractions with related denominators using multiplicative thinking (denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100)	<ul style="list-style-type: none"> <li>develop mental strategies for generating equivalent fractions, such as multiplying or dividing the numerator and the denominator by the same number</li> </ul>
			<ul style="list-style-type: none"> <li>explain or demonstrate why 2 fractions are or are not equivalent</li> </ul>
			<ul style="list-style-type: none"> <li>apply knowledge of equivalent fractions to convert between units of measurement</li> </ul>
Using common factors to simplify proper fractions	1	Using common factors to simplify proper fractions to their simplest form	<ul style="list-style-type: none"> <li>determine a common factor of the numerator and denominator of a fraction and use to find an equivalent fraction. Repeat until the fraction is reduced to its simplest form</li> </ul>
			<ul style="list-style-type: none"> <li>write a fraction in its simplest form using the highest common factor</li> </ul>
			<ul style="list-style-type: none"> <li>know that a fraction is reduced to its simplest form when the only common factor of the numerator and denominator is 1</li> </ul>

Compare and order fractions, including fractions >1			
Quest: Compare and order fractions			
Learning Journey	Steps	Content	Description
Comparing and ordering proper fractions	1	Comparing and ordering proper fractions with the same numerators but different denominators (denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100)	• compare and order proper fractions using a benchmark fraction for support, eg half or quarter
			• compare and order fractions using the relationship between the size of the denominator and the size of the parts
			• record comparisons using >, < or =
			• recognise that comparisons are only valid when the 2 fractions refer to the same whole
	2	Comparing and ordering proper fractions with different numerators and denominators (denominators of 2, 3, 4, 5, 6, 8, 10, 12 and 100)	• compare and order proper fractions using a benchmark fraction for support, eg half or quarter
			• record comparisons using >, < or =
Comparing and ordering mixed numbers	1	Comparing and ordering mixed numerals	• compare and order mixed numerals where the denominators are not always multiples of the same number
			• record comparisons using =, ≠, <, >, ≤, ≥ symbols

Learning Journey	Step	Content	Description
Comparing and ordering improper fractions	1	Comparing and ordering improper fractions	<ul style="list-style-type: none"> <li>compare and order improper fractions where the denominators are not always multiples of the same number</li> <li>record comparisons using <math>=</math>, <math>\neq</math>, <math>&lt;</math>, <math>&gt;</math>, <math>\leq</math>, <math>\geq</math> symbols</li> </ul>
Comparing and ordering fractions and mixed numbers	1	Comparing and ordering proper fractions, improper fractions, and mixed numbers	<ul style="list-style-type: none"> <li>compare and order proper fractions, improper fractions, and mixed numbers where the denominators are not always multiples of the same number</li> <li>record comparisons using <math>=</math>, <math>\neq</math>, <math>&lt;</math>, <math>&gt;</math>, <math>\leq</math>, <math>\geq</math> symbols</li> </ul>

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions			
Quest: Add and subtract fractions			
Learning Journey	Steps	Content	Description
Adding fractions, related denominators	1	Adding proper fractions with related denominators and answers less than 1 whole	<ul style="list-style-type: none"> <li>add proper fractions where the denominators are related</li> </ul>
			<ul style="list-style-type: none"> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
			<ul style="list-style-type: none"> <li>use knowledge of equivalence to simplify answers when adding fractions</li> </ul>
	2	Adding simple fractions with related denominators	<ul style="list-style-type: none"> <li>add fractions where the denominators are related</li> </ul>
			<ul style="list-style-type: none"> <li>use knowledge of equivalence to simplify answers when adding fractions</li> </ul>
			<ul style="list-style-type: none"> <li>where the answer is greater than 1 convert the fraction to a mixed number</li> </ul>
	3	Adding fractions, including mixed numbers, with related denominators	<ul style="list-style-type: none"> <li>add fractions, including mixed numbers, where the denominators are related</li> </ul>
			<ul style="list-style-type: none"> <li>convert an answer that is an improper fraction to a mixed number</li> </ul>
			<ul style="list-style-type: none"> <li>use knowledge of equivalence to simplify answers when adding fractions</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that improper fractions may sometimes make calculations involving mixed numbers easier</li> </ul>
Adding fractions, unrelated denominators	1	Adding fractions and mixed numbers with unrelated denominators	<ul style="list-style-type: none"> <li>add fractions, including mixed numbers, where the denominators are unrelated by finding common denominators</li> </ul>
			<ul style="list-style-type: none"> <li>model and represent strategies, including using diagrams and written representations</li> </ul>
			<ul style="list-style-type: none"> <li>convert an answer that is an improper fraction to a mixed number</li> </ul>

Learning Journey	Step	Content	Description
Subtracting fractions, related denominators	1	Subtracting proper fractions with related denominators and answers less than 1 whole	• use knowledge of equivalence to simplify answers when adding fractions
			• recognise that improper fractions may sometimes make calculations involving mixed numbers easier
			• subtract proper fractions where the denominators are related
	2	Subtracting simple fractions with related denominators	• model and represent strategies, including using diagrams and written representations
			• use knowledge of equivalence to simplify answers when subtracting fractions
			• where the answer is greater than 1 convert the fraction to a mixed number
	3	Subtracting fractions, including mixed numbers, with related denominators	• subtract fractions, including mixed numbers, where the denominators are related
			• convert an answer that is an improper fraction to a mixed number
			• use knowledge of equivalence to simplify answers when subtracting fractions
			• recognise that improper fractions may sometimes make calculations involving mixed numbers easier
Subtracting fractions, unrelated denominators	1	Subtracting fractions and mixed numbers with unrelated denominators	• subtract fractions, including mixed numbers, where the denominators are unrelated by finding common denominators
			• model and represent strategies, including using diagrams and written representations
			• convert an answer that is an improper fraction to a mixed number
			• use knowledge of equivalence to simplify answers when subtracting fractions
			• recognise that improper fractions may sometimes make calculations involving mixed numbers easier
Adding/subtracting fractions, related denominators	1	Adding and subtracting simple proper fractions in which 1 denominator is a multiple of another (denominators 2, 3, 4, 5, 6, 7, 8, 10, 12, 100)	• add and subtract proper fractions where 1 denominator is the same as, or a multiple of, the other
			• use knowledge of equivalence to simplify answers when adding and subtracting fractions

Learning Journey	Step	Content	Description
	2	Adding and subtracting proper fractions with related denominators and answers less than 1 whole	• add and subtract proper fractions where the denominators are related
			• model and represent strategies, including using diagrams and written representations
			• use knowledge of equivalence to simplify answers when adding and subtracting fractions
	3	Adding and subtracting fractions including mixed numbers, with related denominators	• add and subtract fractions where the denominators are related
			• use knowledge of equivalence to simplify answers when adding and subtracting fractions
			• where the answer is greater than 1 convert the fraction to a mixed number
	4	Solving word problems involving fractions and mixed numbers with the related denominators	• solve word problems involving the addition and subtraction of fractions where 1 denominator is the same as, or a multiple of, the other
Add/subtract fractions, unrelated denominators	1	Adding and subtracting fractions and mixed numbers with unrelated denominators	• add and subtract fractions, including mixed numbers, where the denominators are unrelated by finding common denominators
			• model and represent strategies, including using diagrams and written representations
			• convert an answer that is an improper fraction to a mixed number
			• use knowledge of equivalence to simplify answers when adding and subtracting fractions
			• recognise that improper fractions may sometimes make calculations involving mixed numbers easier
	2	Solving word problems involving fractions and mixed numbers with the unrelated denominators	• solve word problems involving the addition and subtraction of fractions with unrelated denominators

Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example,  $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ]

**Quest: Multiply proper fractions**

Learning Journey	Steps	Content	Description
Multiplying proper fractions	1	Multiplying 2 proper fractions	• multiply 2 proper fractions using written methods

Divide proper fractions by whole numbers [for example,  $\frac{1}{3} \div 2 = \frac{1}{6}$ ]

**Quest: Divide proper fractions by whole numbers**

Learning Journey	Steps	Content	Description
Dividing proper fractions by whole numbers	1	Dividing a unit fraction by a positive integer	• divide unit fractions by whole numbers, eg $\frac{1}{3} \div 2 = \frac{1}{6}$

Learning Journey	Step	Content	Description
	2	Dividing a proper fraction by a positive integer	<ul style="list-style-type: none"> <li>• divide a non-unit proper fraction by a whole number (where the divisor is a factor of the numerator). Use diagrams for support</li> <li>• divide a non-unit proper fraction by any whole number</li> </ul>

Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example,  $\frac{3}{8}$ ]

Quest: Interpret fractions as division			
Learning Journey	Steps	Content	Description
Interpreting fractions as division	1	Interpreting fractions as division	<ul style="list-style-type: none"> <li>• interpret a fraction as division of the numerator by the denominator (no decimals)</li> <li>• solve word problems involving division of whole numbers, using models to represent the problem, eg 3 pizzas shared equally among 4 people</li> </ul>
Quest: Convert simple fractions to decimals			
Converting simple fractions to decimals	1	Converting simple fractions to decimals using place value models and short division	<ul style="list-style-type: none"> <li>• convert simple fractions into decimals using short division and knowledge of tens, eg, <math>\frac{5}{8} = 5.0 \div 8</math> or 50 tenths divided by 8 = 0.625</li> </ul>

Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places

Quest: Multiply/divide decimals by powers of 10			
Learning Journey	Steps	Content	Description
Multiplying decimals by 10, 100 and 1,000	1	Multiplying decimals by 10	<ul style="list-style-type: none"> <li>• use PV equipment to multiply decimals by 10</li> <li>• recognise that the digits move one place to the left</li> <li>• use zero as a place holder</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move 2 places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 100</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the digits move three places to the left</li> <li>• use zero as a place holder</li> <li>• use PV equipment to multiply decimals by 1,000</li> </ul>
	4	Multiplying decimals by 10, 100, 1,000	<ul style="list-style-type: none"> <li>• multiply decimals by 10, 100, 1,000</li> </ul>
Dividing decimals by 10, 100 and 1,000	1	Dividing decimals by 10	<ul style="list-style-type: none"> <li>• recognise that the digits move one place the right</li> <li>• use zero as a place holder</li> <li>• use PV equipment to divide decimals by 10</li> </ul>

Learning Journey	Step	Content	Description
	2	Dividing decimals by 100	• recognise that the digits move 2 places to the right
			• use zero as a place holder
			• use PV equipment to divide decimals by 100
	3	Dividing decimals by 1,000	• recognise that the digits move three places to the right
			• use zero as a place holder
			• use PV equipment to divide decimals by 1000
	4	Dividing decimals by 10, 100, 1,000	• divide decimals by 10, 100, 1,000
<b>Quest: Identify decimal place value</b>			
Identifying decimal place value	1	Introducing decimal thousandths	• recognise that the place value system can be extended beyond hundredths
			• express thousandths as decimals
			• interpret decimal notation for thousandths, eg, $0.123 = \frac{123}{1,000}$
			• state the place value of digits in decimal numbers of up to 3 decimal places
			• model thousandths using concrete materials
			• represent decimal fractions, eg, as fractions (tenths, hundredths and thousandths), using concrete materials and in diagrams

Multiply one-digit numbers with up to 2 decimal places by whole numbers			
<b>Quest: Multiply decimals and whole numbers</b>			
Learning Journey	Steps	Content	Description
Multiplying decimals and whole numbers	1	Multiplying tenths and whole numbers using mental strategies	• use efficient mental strategies to multiply tenths and whole numbers
	2	Multiplying hundredths and whole numbers using mental strategies	• use efficient mental strategies to multiply hundredths and whole numbers

Use written division methods in cases where the answer has up to 2 decimal places			
<b>Quest: Divide decimals and whole numbers</b>			
Learning Journey	Steps	Content	Description
Dividing decimals and whole numbers	1	Dividing whole numbers and decimals up to 2 places using the standard algorithm	• divide whole numbers by decimals up to 2 places
			• divide a decimal number up to hundredths by another decimal number up to hundredths



Solve problems which require answers to be rounded to specified degrees of accuracy			
Quest: Round with decimals			
Learning Journey	Steps	Content	Description
Using rounding to check division	1	Dividing whole numbers and decimals of up to 2 decimal places using mental strategies	<ul style="list-style-type: none"> <li>• divide decimals by a one-digit whole number where the result is a terminating decimal, eg <math>5.25 \div 5 = 1.05</math></li> </ul>
			<ul style="list-style-type: none"> <li>• solve word problems involving the division of decimals, including those involving money</li> </ul>
			<ul style="list-style-type: none"> <li>• use estimation and rounding to check the reasonableness of answers when dividing decimals</li> </ul>
Rounding decimals	1	Round decimals to hundredths	<ul style="list-style-type: none"> <li>• round decimal thousandths to the nearest hundredth</li> </ul>
	2	Round decimals to tenths or hundredths	<ul style="list-style-type: none"> <li>• round decimal thousandths to the nearest tenths or hundredths</li> </ul>

Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts			
Quest: Fractions, decimals and percentages			
Learning Journey	Steps	Content	Description
Representing simple fractions as percentages	1	Representing simple fractions as percentages	<ul style="list-style-type: none"> <li>• represent simple fractions as percentages and vice versa</li> </ul>
			<ul style="list-style-type: none"> <li>• model percentages with concrete materials/ drawings, eg using 10x10grid</li> </ul>
Representing percentages and decimals	1	Representing percentages and decimals	<ul style="list-style-type: none"> <li>• write decimals (<math>&lt; 1</math>) to 2 decimal places as percentages</li> </ul>
			<ul style="list-style-type: none"> <li>• model percentages and decimals using diagrams, eg number line or 100 grid</li> </ul>
			<ul style="list-style-type: none"> <li>• write decimals as percentages and vice versa</li> </ul>
Fraction, decimal and percentage equivalence	1	Investigating the relationships between fractions, decimals and percentages	<ul style="list-style-type: none"> <li>• investigate using concrete materials, drawings and calculators, the relationships between decimals, percentages and fractions with denominators of 2, 4, 5, 10, 20, 25, 50 and 100</li> </ul>
			<ul style="list-style-type: none"> <li>• record relationships between decimals, percentages and fractions (with denominators 2, 4, 5, 10, 20, 25, 50, 100)</li> </ul>
			<ul style="list-style-type: none"> <li>• demonstrate understanding using symbolic representation</li> </ul>
	2	Representing equivalent fractions, decimals and percentages	<ul style="list-style-type: none"> <li>• write percentages as fractions in their simplest form</li> </ul>
			<ul style="list-style-type: none"> <li>• write fractions with denominators that are factors of 100 as percentages by multiplying the numerator and denominator by a common value</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• write fractions with denominators that are not factors of 100 as percentages by writing as a decimal first, eg using short division, then x100 to write as a percentage</li> <li>• write percentages as decimals and vice versa</li> <li>• represent equivalent fractions, decimals and percentages</li> <li>• select and justify the most appropriate representation of a quantity — fraction, decimal, percentage</li> </ul>

## 14 Ratio and proportion

### 14.1 Ratio and proportion

Solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts			
Quest: Solve problems involving ratios			
Learning Journey	Steps	Content	Description
Solving problems involving ratios	1	Introducing simple ratios	• use ratios to compare quantities measured in the same units
			• represent ratios found in real-life contexts, using concrete materials, drawings, and standard fractional notation
			• write ratios using the : symbol
			• express 1 part of a ratio as a fraction of the whole

Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison			
Quest: Calculate percentages			
Learning Journey	Steps	Content	Description
Calculating simple percentages	1	Calculating simple percentages	• estimate 0%, 1%, 10%, 25%, 50% and 100% of an amount including examples in context (exclude discounts), explain estimation
			• model 10%, 25% and 50% of an amount
			• calculate 10%, 25% and 50% of an amount including examples in context (exclude discounts)
Calculating simple percentages of quantities	1	Calculating simple percentages of quantities	• equate 10% to $\frac{1}{10}$ , 25% to $\frac{1}{4}$ and 50% to $\frac{1}{2}$
			• use mental strategies to estimate discounts of 10%, 25% and 50%
			• calculate the sale price of an item after a discount of 10%, 25% and 50%, recording the strategy and result

Solve problems involving similar shapes where the scale factor is known or can be found			
Quest: Solve problems involving scale factor			
Learning Journey	Steps	Content	Description
Solving problems involving scale factor	1	Drawing 2D shapes with a scale factor up to 5	• draw 2D shapes with a scale factor up to 5
	2	Calculating scale factors of similar shapes	• expressing enlargements of a 2D shape using the term scale factor
			• calculate scale factors of similar shapes

Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples			
Quest: Solve problems with unequal quantities			
Learning Journey	Steps	Content	Description
Solving problems involving unequal quantities	1	Calculating ratios from word problems	<ul style="list-style-type: none"> <li>calculate ratios from word problems</li> </ul>

# 15 Algebra

## 15.1 Algebra

Generate and describe linear number sequences			
Quest: Generate linear number sequences			
Learning Journey	Steps	Content	Description
Generating linear number sequences	1	Interpreting and creating number patterns involving 1 operation in the term-to-term rule	• complete number patterns involving one operation
			• describe the pattern in a variety of ways and record descriptions in words, eg 'It goes up by ones, starting from four'
			• interpret explanations written by peers and teachers that accurately describe number patterns
			• use the rule to predict the next few terms and predict whether a particular value will be in the pattern
			• find missing terms in the number sequence
	2	Generating a linear sequence given the nth term rule	• Generate the first few terms of a linear sequence given the nth term rule
			• use the nth term rule to find missing terms of the sequence (eg 100th term)
			• use the nth term rule to determine whether a number exists in a sequence
Finding the rule for a linear number sequence	1	Developing and representing the general term of a linear growing pattern	• develop and represent the general term of a linear growing pattern, using algebraic expressions involving 1 operation, eg the general term for the sequence 4, 5, 6, 7, ... can be written algebraically as $n + 3$ , where $n$ represents the term number; the general term for the sequence 5, 10, 15, 20, ... can be written algebraically as $5n$ , where $n$ represents the term number
		Developing and representing the general term of a linear growing pattern with 2 operations	• develop and represent the general term of a linear growing pattern, using algebraic expressions and equations involving 2 operations
Finding the nth term of simple linear sequences	1	Finding the nth term of simple linear sequences (increasing and whole number coefficient on $n$ )	• know that the position-to-term rule, written algebraically, is known as the nth term rule of a sequence
			• understand how the term-to-term rule can help to identify the nth term

Express missing number problems algebraically			
Quest: Write and solve missing number problems			
Learning Journey	Steps	Content	Description
Writing and solving equations	1	Writing and solving equations for real-world problems of the form $x + p = q$ and $px = q$ (nonnegative rational numbers)	<ul style="list-style-type: none"> <li>• write and solve equations for real-world problems of the form <math>x + p = q</math> and <math>px = q</math> (nonnegative rational numbers)</li> </ul>

Find pairs of numbers that satisfy an equation with 2 unknowns			
Quest: Equations with 2 unknowns			
Learning Journey	Steps	Content	Description
Equations with 2 unknowns	1	Finding pairs of numbers that satisfy an equation with 2 unknowns	<ul style="list-style-type: none"> <li>• find pairs of numbers that satisfy an equation with 2 unknowns</li> <li>• discuss the number of possibilities of different solutions</li> </ul>

## 16 Measurement

### 16.1 Measurement

Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places

Quest: Convert measurements, decimal notation			
Learning Journey	Steps	Content	Description
Converting between common metric units of length	1	Converting between common metric units of length up to 3 decimal places	<ul style="list-style-type: none"> <li>• understand the meaning of metric prefixes, eg kilo-, centi- and milli-</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between metres and kilometres</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between millimetres, centimetres and metres to compare lengths and distances</li> </ul>
			<ul style="list-style-type: none"> <li>• relate the multiplicative relationship between centimetres and metres, metres and kilometres</li> </ul>
			<ul style="list-style-type: none"> <li>• explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units</li> </ul>
Converting between standard metric units of mass	1	Converting between standard metric units of mass up to 3 decimal places	<ul style="list-style-type: none"> <li>• understand the meaning of metric prefixes, eg kilo-, centi-, milli-</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between grams and kilograms and vice versa</li> </ul>
			<ul style="list-style-type: none"> <li>• convert between kilograms and tonnes and vice versa</li> </ul>
			<ul style="list-style-type: none"> <li>• convert among grams, kilograms and tonnes</li> </ul>
			<ul style="list-style-type: none"> <li>• solve problems using different units of mass</li> </ul>
Converting between common metric units of capacity	1	Converting between common metric units of capacity (to 3 decimal places)	<ul style="list-style-type: none"> <li>• convert between millilitres and litres</li> </ul>
			<ul style="list-style-type: none"> <li>• explain and use the relationship between the size of a unit and the number of units needed to assist in determining whether multiplication or division is required when converting between units</li> </ul>

Convert between miles and kilometres

Quest: Convert between miles and kilometres			
Learning Journey	Steps	Content	Description
Converting between miles and kilometres	1	Converting between imperial and metric units of length (miles and kilometres)	<ul style="list-style-type: none"> <li>• convert between imperial and metric units of length (miles and kilometres) including real-world examples</li> </ul>

Calculate the area of parallelograms and triangles			
Quest: Area of parallelograms and triangles			
Learning Journey	Steps	Content	Description
Calculating the area of a triangle	1	Calculating area of any triangle	<ul style="list-style-type: none"> <li>establish that the area of any triangle is <math>\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{perpendicular height}</math>, including triangles in which the perpendicular height meets the base within the length of the base and also triangles in which the perpendicular height (altitude) meets the base outside the length of the base</li> </ul>
			<ul style="list-style-type: none"> <li>calculate the area of triangles where more dimensions than are necessary are given, using the relationship that the area is half the area of a rectangle with the same base and perpendicular height</li> </ul>
Calculating the area of a parallelogram	1	Finding the area of a parallelogram using a formula	<ul style="list-style-type: none"> <li>apply the formula to find the area of parallelograms in different orientations</li> </ul>
			<ul style="list-style-type: none"> <li>apply the formula to find the area of parallelograms in different orientations which include more dimensions than are necessary to calculate the area</li> </ul>

Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm <sup>3</sup> ) and cubic metres (m <sup>3</sup> ), and extending to other units [for example, mm <sup>3</sup> and km <sup>3</sup> ]			
Quest: Find the volume of cubes and cuboids			
Learning Journey	Steps	Content	Description
Calculating the volume of cubes and cuboids	1	Calculating, estimating and comparing volumes of cubes and cuboids	<ul style="list-style-type: none"> <li>estimate, calculate and compare volumes of cubes and cuboids using standard units including mm<sup>3</sup> and km<sup>3</sup></li> </ul>
	2	Finding the volume of a cube and cuboid using a formula	<ul style="list-style-type: none"> <li>find the volume of a cube and cuboid using a formula given its length, width or height</li> </ul>
			<ul style="list-style-type: none"> <li>find the length of a cube and cuboid given its volume</li> </ul>



## 17 Geometry

### 17.1 Properties of shapes

Recognise, describe and build simple 3-D shapes, including making nets			
Quest: Recognise and describe simple 3-D shapes			
Learning Journey	Steps	Content	Description
Describing and naming prisms and pyramids	1	Comparing, describing and naming prisms	<ul style="list-style-type: none"> <li>identify and determine the number of pairs of parallel faces of 3D shapes, eg, 'A cuboid has three pairs of parallel faces'</li> </ul>
			<ul style="list-style-type: none"> <li>identify the 'base' of prisms</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that the base of a prism is not always the face where the prism touches the ground</li> </ul>
			<ul style="list-style-type: none"> <li>name prisms according to the shape of their base, eg, cuboid</li> </ul>
			<ul style="list-style-type: none"> <li>recognise a cube as a special type of prism</li> </ul>
	2	Comparing, describing and naming pyramids	<ul style="list-style-type: none"> <li>identify and determine the number of faces of 3D shapes</li> </ul>
			<ul style="list-style-type: none"> <li>identify the 'base' of pyramids</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that the base of a pyramid is not always the face where the prism touches the ground</li> </ul>
Investigating cross-sections of prisms & pyramids	1	Investigating cross-sections of prisms and pyramids	<ul style="list-style-type: none"> <li>recognise that prisms have a 'uniform cross-section' when the section is parallel to the base</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that the base of a prism is identical to the uniform cross-section of the prism</li> </ul>
			<ul style="list-style-type: none"> <li>recognise that pyramids do not have a uniform cross-section when the section is parallel to the base</li> </ul>
Connecting 3-D shapes with their nets	1	Connecting prisms and pyramids with their nets	<ul style="list-style-type: none"> <li>examine a diagram to determine whether it is or is not the net of a prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>explain why a given net will not form a prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>visualise and sketch nets for a given prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>recognise whether a diagram is a net of a particular prism or pyramid</li> </ul>
			<ul style="list-style-type: none"> <li>visualise and name prisms and pyramids, given diagrams of their nets</li> </ul>
			<ul style="list-style-type: none"> <li>select the correct diagram of a net for a given prism or pyramid from a group of similar diagrams where the others are not valid nets of the object</li> </ul>

Learning Journey	Step	Content	Description
	2	Connecting 3D shapes with their nets	<ul style="list-style-type: none"> <li>• examine a diagram to determine whether it is or is not the net of a closed 3D shape</li> </ul>
			<ul style="list-style-type: none"> <li>• explain why a given net will not form a closed 3D shape</li> </ul>
			<ul style="list-style-type: none"> <li>• visualise and sketch nets for given 3D shapes</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise whether a diagram is a net of a particular 3D shape</li> </ul>
			<ul style="list-style-type: none"> <li>• visualise and name prisms and pyramids, given diagrams of their nets</li> </ul>
			<ul style="list-style-type: none"> <li>• select the correct diagram of a net for a given 3D shape (include other regular polyhedrons)</li> </ul>

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons			
Quest: Classify geometric shapes			
Learning Journey	Steps	Content	Description
Classifying triangles by their sides and angles	1	Classifying triangles by their sides and angles	<ul style="list-style-type: none"> <li>• identify and name right-angled, equilateral, isosceles and scalene triangles</li> </ul>
			<ul style="list-style-type: none"> <li>• compare and describe features of the sides and angles of equilateral, isosceles and scalene triangles</li> </ul>
			<ul style="list-style-type: none"> <li>• identify triangles that are right-angled as well as scalene or isosceles</li> </ul>
			<ul style="list-style-type: none"> <li>• explore, by measurement, side and angle properties of equilateral, isosceles and scalene triangles</li> </ul>
Classifying quadrilaterals by their features	1	Classifying quadrilaterals by their features	<ul style="list-style-type: none"> <li>• explore, by measurement angle properties of squares, rectangles, parallelograms and rhombuses</li> </ul>
			<ul style="list-style-type: none"> <li>• select and classify a two-dimensional shape from a description of its features including parallel and perpendicular lines</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that two-dimensional shapes can be classified in more than 1 way</li> </ul>
			<ul style="list-style-type: none"> <li>• explain the difference between regular and irregular shapes</li> </ul>
	2	Classifying quadrilaterals using a variety of strategies	<ul style="list-style-type: none"> <li>• classify 2D shapes in a hierarchy based on properties</li> </ul>
			<ul style="list-style-type: none"> <li>• interpret a hierarchy diagram of 2D shapes and their properties</li> </ul>
Classifying shapes in a hierarchy	1	Classifying two-dimensional figures in a hierarchy	<ul style="list-style-type: none"> <li>• use Venn diagrams to record classifications</li> </ul>
			<ul style="list-style-type: none"> <li>• interpret classifications represented using Venn diagrams</li> </ul>
Classifying shapes in a hierarchy	1	Classifying two-dimensional figures in a hierarchy	<ul style="list-style-type: none"> <li>• classify two-dimensional figures in a hierarchy based on properties</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>interpret a hierarchy diagram of two-dimensional shapes and their properties</li> </ul>
<b>Quest: Find unknown angles</b>			
Calculating interior angles of triangles	1	Calculating sum of interior angles of a triangle	<ul style="list-style-type: none"> <li>explore through measurement the sum of interior angles of a triangle</li> <li>calculate an unknown angle represented by a variable within a triangle, given the other 2 angles</li> </ul>
Calculating interior angles of quadrilaterals	1	Exploring interior angles of special quadrilaterals	<ul style="list-style-type: none"> <li>use knowledge of properties of shapes to understand the sum of the interior angles in any quadrilateral is 360 degrees</li> <li>identify missing angles in various quadrilaterals (rectangle, square, rhombus, parallelogram, trapezium, kite)</li> </ul>
Calculating interior angles of regular polygons	1	Exploring interior angles in regular polygons	<ul style="list-style-type: none"> <li>explore the relationship between splitting a polygon into triangles and the sum of the interior angles of the polygon</li> <li>identify patterns in a table of features related to polygons showing number of sides and number of triangles which can be formed</li> </ul>

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

**Quest: Name the parts of circles**

Learning Journey	Steps	Content	Description
Naming the parts of circles	1	Introducing parts of a circle: centre, radius, diameter and circumference	<ul style="list-style-type: none"> <li>identify and name parts of circles</li> <li>create a circle by finding points that are all the same distance from a fixed point</li> </ul>

Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

**Quest: Find missing angles**

Learning Journey	Steps	Content	Description
Adjacent, straight, and vertically opposite angles	1	Exploring adjacent angles that form a right angle	<ul style="list-style-type: none"> <li>explore the relationship between angles that form a right angle</li> <li>calculate an unknown angle within a right angle given the other parts</li> </ul>
	2	Exploring adjacent angles that form a straight angle	<ul style="list-style-type: none"> <li>explore the relationship between angles that form a straight angle</li> <li>calculate an unknown angle within a straight angle given the other parts</li> </ul>
	3	Exploring vertically opposite angles	<ul style="list-style-type: none"> <li>explore the relationship between angles formed when 2 straight lines intersect and identify these as 'vertically opposite angles'</li> </ul>

Learning Journey	Step	Content	Description
			<ul style="list-style-type: none"> <li>• use the equality of vertically opposite angles to find the size of unknown angles in diagrams</li> </ul>
			<ul style="list-style-type: none"> <li>• use the equality of vertically opposite angles to find the size of unknown angles represented by variables in diagrams</li> </ul>

## 17.2 Position and direction

Describe positions on the full coordinate grid (all 4 quadrants)			
Quest: Describe positions, 4 quadrants			
Learning Journey	Steps	Content	Description
Describing positions, 4 quadrants	1	Introducing the Cartesian coordinate system	<ul style="list-style-type: none"> <li>• recognise that the Cartesian plane consists of a horizontal axis (x-axis) and a vertical axis (y-axis), creating 4 quadrants</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the horizontal axis and the vertical axis meet at right angles</li> </ul>
			<ul style="list-style-type: none"> <li>• identify the point of intersection of the 2 axes as the origin, having coordinates (0, 0)</li> </ul>
	2	Locating points on the Cartesian plane	<ul style="list-style-type: none"> <li>• plot and label points, given coordinates, in all 4 quadrants of the Cartesian plane</li> </ul>
			<ul style="list-style-type: none"> <li>• identify and label each quadrant on a Cartesian plane</li> </ul>
			<ul style="list-style-type: none"> <li>• plot a sequence of coordinates to create a picture</li> </ul>
Drawing polygons on the coordinate grid	1	Drawing polygons in the coordinate grid given coordinates for the vertices	<ul style="list-style-type: none"> <li>• identify and record the coordinates of given points in all 4 quadrants of the Cartesian plane</li> </ul>
			<ul style="list-style-type: none"> <li>• recognise that the order of coordinates is important when locating points on the Cartesian plane, eg, (2, 3) is a location different from (3, 2)</li> </ul>
	2	Finding the missing coordinate of a figure	<ul style="list-style-type: none"> <li>• draw polygons in the coordinate grid given coordinates for the vertices</li> </ul>
	2	Finding the missing coordinate of a figure	<ul style="list-style-type: none"> <li>• find the missing coordinate of a figure with a coordinate grid</li> </ul>
			<ul style="list-style-type: none"> <li>• find the missing coordinate of a figure coordinates only</li> </ul>

Draw and translate simple shapes on the coordinate plane, and reflect them in the axes			
Quest: Translations & reflections, 4 quadrants			
Learning Journey	Steps	Content	Description
Reflections, 4 quadrants	1	Recognising that when 2 ordered pairs differ only by signs, the locations of the points are reflections across 1 or both axes	<ul style="list-style-type: none"> <li>• recognise that when 2 ordered pairs differ only by signs, the locations of the points are reflections across 1 or both axes</li> </ul>
	2	Plotting and stating the coordinates of the image of a given point on the Cartesian plane resulting from reflection in either the x-axis or y-axis	<ul style="list-style-type: none"> <li>• plot and state the coordinates of the image of a given point on the Cartesian plane resulting from reflection in either the x-axis or y-axis</li> </ul>
			<ul style="list-style-type: none"> <li>• investigate and describe the relationship between the coordinates of P and P' following a reflection in the x- or y-axis</li> </ul>

Learning Journey	Step	Content	Description
Understanding translations, 4 quadrants	1	Plotting translations of points on the Cartesian plane	<ul style="list-style-type: none"> <li>plot and state the coordinates of the image of a point on the Cartesian plane resulting from 1 or more translations</li> </ul>
	2	Performing successive translations	<ul style="list-style-type: none"> <li>perform up to 3 consecutive translations, recognising which 1 translation would have the same result</li> </ul>

## 18 Statistics

### 18.1 Statistics

Interpret and construct pie charts and line graphs and use these to solve problems			
Quest: Identifying pie charts and line graphs			
Learning Journey	Steps	Content	Description
Interpreting and constructing pie charts	1	Interpreting pie charts	• interpret pie charts using proportional reasoning and percentages
			• find the whole from the parts and vice versa
			• ask and answer comparison questions; make conclusions; identify data values
	2	Constructing pie charts	• construct pie charts using proportional reasoning and represent sectors as percentages
			• use knowledge of protractors and angles to construct pie charts; include a suitable title, labels and key
			• ask and answer questions related to data in the pie chart; draw conclusions
	3	Solving problems using pie charts	• use proportional reasoning and the 4 operations to solve problems related to data in a pie chart
Interpreting and constructing line graphs	1	Constructing a line graph using a scale of many-to-one correspondence	• construct a line graph using a scale of many-to-one correspondence, with and without the use of digital technologies
			• name and label the horizontal and vertical axes when constructing graphs
			• choose an appropriate title to describe the data represented in a data display
			• determine an appropriate scale of many-to-one correspondence to represent the data in a data display
			• mark equal spaces on the axes when constructing graphs, and use the scale to label the markers
			• interpret data in line graph representing primary data; ask and answer questions related to the data in the display; draw conclusions
	2	Interpreting primary and secondary data in a line graph	• interpret line graphs using the scales on the axes
			• describe and interpret data presented in line graphs
			• identify and describe relationships that can be observed in data displays

Calculate and interpret the mean as an average			
Quest: Calculate and interpret the mean			
Learning Journey	Steps	Content	Description
Calculating and interpreting the mean	1	Understanding the mean	<ul style="list-style-type: none"> <li>• explore a set of values in data displays and in lists with the aim of summarising all of the values with a single number</li> <li>• calculate the mean for a small set of data that would produce a whole number</li> <li>• use the mean to describe the shape of the data set across its range of values, using charts, tables, and graphs (eg, 'The data values fall mainly into two groups on both sides of the mean.'; 'The set of data is not spread out evenly around the mean.')</li> <li>• decide if the mean is the best representative number for the centre of the data set; justify and discuss</li> </ul>
	2	Calculating the mean	<ul style="list-style-type: none"> <li>• calculate the mean for a small set of data</li> </ul>





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