



Mathematics Planning
National Curriculum
2022

Year 5

Key Principles:

The curriculum builds on prior learning with progression throughout the school. Consideration is given to the order in which knowledge is taught so that children can relate their learning to previous learning. There are key concepts that children must know by the end of year 6 – these are the ‘nuggets’ of learning in this subject (sticky knowledge, components). Recall opportunities relating to the key concepts are built into the planning regularly so that children retain these ‘nuggets’ so that they ‘know more, remember more and can do more’.

How to Use the Medium Term Planning

This planning document is intended to provide planning support to meet all statutory requirements of the National Curriculum and to aid teachers in planning a progressive learning journey for children within Year 5.

Overview Documents

This document starts with the mathematics skills and the coverage of each strand across the entire year of planning. Teachers and TAs can use this to plan mixed starters in order to pre-teach, consolidate learning or as revision, as well as guidance for day-to-day planning, assessment (linked to ScholarPack) and establishing how long until a topic will next be revisited or if additional lessons to achieve the skill are necessary.

Number - number and place value		Coverage					
[E1]	Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	Aut1	Aut2	Sp1	Sp2	Sum1	Sum2
[E2]	Read, write, order and compare numbers to at least 1,000,000	W1				W1	W1
[E3]	Determine the value of each digit in numbers up to 1,000,000	W1				W1	W1
[E4]	Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals		W1				
[E5]	Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	W1				W1	W1
[E6]	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero		W1				W1
[E7]	Solve number problems and practical problems that involve \times and \div	W1					W1
Number - addition and subtraction (calculations)		Coverage					
[C1]	Add and subtract numbers mentally with increasingly large numbers	W5	W2	W5	W5		
[C2]	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	W3	W2	W5	W5	W2	
[C3]	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	W3	W2	W5	W5	W2	
[C4]	Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why	W3	W2	W5	W5	W2	
Number - multiplication and division (calculations)		Coverage					
[D1]	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	Aut1	Aut2	Sp1	Sp2	Sum1	Sum2
[D2]	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	W1	W3	W1			

Year 5 Mathematics Yearly Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Week 1	Place value	Mental \times and \div (factors, multiples)	Place value Roman numerals counting incl. negative numbers	Mental and written division	Place value	Place value
Week 2	Place value (decimals)	Division including problems	Addition and subtraction including problems	2D and 3D shape incl. sorting	Fractions	Written calculations
Week 3	Written \pm and \div including problems	Fractions (compare, order, equivalence)	Mental and written multiplication	Calculating with fractions	Measures (time) and statistics	Fractions
Week 4	Geometry (angles)	Multiplication and measures (area)	Measures (length, mass and capacity)	Measures (area and volume)	Geometry	Measures (mass, volume and capacity)
Week 5	Geometry and measures (perimeter)	Statistics and measures (time)	Geometry (reflection and translation)	Statistics and measures	Addition and subtraction	Area and volume of shapes
Week 6	Addition and subtraction (statistics)	Assess and review	Geometry (angles)	Assess and review	Multiplication and division	Assess and review

‘Ctrl’ and clicking on each week will take you to the associated Half Termly Planning, outlining the focus area for each week in more detail.

This is followed by an overview document. This identifies six half termly blocks of six weeks with focus areas of mathematics for each week. The units are designed to be cohesive and allow for application of learning and skills across the mathematics curriculum. The ‘assess and review’ weeks can be used to gain information for teacher assessments or can be used to pick up elements that need further support. It is not designed to be used as an entire week of testing with no teaching. This is a suggested layout and teachers should adapt to meet the needs of their class as required.

Half Termly Planning Documents

The half termly planning documents have been compiled to the following principles:

- Each half term is predominantly learning about number.
- Almost all weeks are focused on one area of mathematics, giving children time to focus on a single area for a longer amount of time.
- The 'knowledge' explains the understanding the child will need to achieve the skills. This also explains why specific skills have been put together and how to enhance the teaching and learning during that week, e.g. number work is often given a context of data, measures, money or problem solving.
- The skills are the end of year expectations and it is the decision of teachers whether to visit the whole objective more than once throughout the year or to organise progression within each objective.
- Every skill is covered at least twice within the year.

Adaptive teaching

At Brettenham, we help children develop their conceptual understanding of mathematics by using concrete objects, pictorial representations and abstract thinking, therefore if a child is struggling with a particular abstract concept, we adapt and take a step back to concrete or pictorial, providing them with resources to enable them to understand. As the objectives in the yearly plans are based on age related expectations, children who may struggle to reach the objectives independently will be provided with scaffolds to provide extra support. Scaffolding supports mathematical understanding by providing the necessary support in applying new information. These approaches help children achieve in lessons which they would not be able to on their own.

Progression

The planning documents are followed by a table showing skill progression from Early Years to Year 6. This can be used to establish and build upon previous knowledge, see where children’s learning is heading and to also easily identify and fill any gaps in their knowledge.

Addition, subtraction, multiplication and division (calculations)							
Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
C1 Add/ subtract mentally		1C1 Represent and use number bonds and related subtraction facts within 20	2C1a Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	3C1 Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds			
			2C1b Add and subtract numbers mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers	3C1a Add and subtract numbers mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers			
	40 – 60 months To find the total of items in	1C2a Add and subtract one-digit numbers	2C2 Add and subtract numbers	3C2 Add and subtract numbers	4C2 Add and subtract numbers	5C2 Add and subtract whole	

National Curriculum Documentation

At the end of this document is the National Curriculum programme of study for Year 5. This contains the skills for Year 5 along with the non-statutory guidance to help with interpretation.

Yearly skills and coverage for Year 5 Mathematics

With links to the Content Domain

Number - number and place value	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5N1) Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	W1				W1	W1
(5N2) Read, write, order and compare numbers to at least 1,000,000	W1				W1	W1
(5N3a) Determine the value of each digit in numbers up to 1,000,000	W1				W1	W1
(5N3b) Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals			W1			
(5N4) Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	W1				W1	W1
(5N5) Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero			W1			W1
(5N6) Solve number problems and practical problems that involve 5N1 - 5N5	W1				W1	W1
Number - addition and subtraction (calculations)	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5C1) Add and subtract numbers mentally with increasingly large numbers	W6		W2	W5	W5	
(5C2) Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	W3		W2	W5	W5	W2
(5C3) Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	W3		W2		W5	W2
(5C4) Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	W3		W2	W5	W5	
Number - multiplication and division (calculations)	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5C5a) Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers		W1	W3	W1		
(5C5b) Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers		W1				
(5C5c) Establish whether a number up to 100 is prime and recall prime numbers up to 19		W1				
(5C5d) Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)		W1			W6	
(5C6a) Multiply and divide numbers mentally drawing upon known facts		W1	W3	W1		
(5C6b) Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000	W2				W6	
(5C7a) 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		W4	W3			W2
(5C7b) 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		W2		W1	W6	W2
(5C8a) Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes		W1 W2	W3			
(5C8b) Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign				W1		W2
(5C8c) Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates			W3	W1	W6	
Number - fractions	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5F2a) 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, $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$]				W3	W2	
(5F2b) Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths		W3			W2	
(5F3) Compare and order fractions whose denominators are all multiples of the same number		W3			W2	
(5F4) Add and subtract fractions with the same denominator and denominators that are multiples of the same number				W3	W2	
(5F5) Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams					W2	
(5F6a) Read and write decimal numbers as fractions [for example, $0.71 = 71/100$]		W3				
(5F6b) Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	W2					
(5F7) Round decimals with two decimal places to the nearest whole number and to one decimal place	W2				W1	W3
(5F8) Read, write, order and compare numbers with up to three decimal places	W2				W1	
(5F10) Solve problems involving number up to three decimal places	W2					W3
(5F11) 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						W3
(5F12) Solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those fractions with a denominator of a multiple of 10 or 25						W3
Measurement	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5M4) Solve problems involving converting between units of time		W5			W3	W4
(5M5) Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)			W4			
(5M6) Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints					W3	W3
(5M7a) Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	W5					
(5M7b) Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes		W4		W4		W5

(5M8) Estimate volume [for example, using 1 cm ³ blocks to build cuboids (including cubes)] and capacity [for example, using water]			W4	W5		W5
(5M9a) Use all four operations to solve problems involving measure [for example, money] using decimal notation, including scaling			W2			W4
(5M9b) Use all four operations to solve problems involving measure [for example, length] using decimal notation, including scaling			W2			W4
(5M9c) Use all four operations to solve problems involving measure [for example, mass] using decimal notation, including scaling			W2			W4
(5M9d) Use all four operations to solve problems involving measure [for example, volume] using decimal notation, including scaling			W2			W4
Geometry - properties of shapes	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5G2a) Use the properties of rectangles to deduce related facts and find missing lengths and angles	W5			W2	W4	
(5G2b) Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	W5		W5	W2	W4	
(5G3b) Identify 3-D shapes, including cubes and other cuboids, from 2-D representations				W2	W4	
(5G4a) Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	W4		W6			
(5G4b) Identify angles at a point and one whole turn (total 360), angles at a point on a straight line and 1/2 a turn (total 180) and other multiples of 90			W6			
(5G4c) Draw given angles, and measure them in degrees	W4		W6			
Geometry – position and direction	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5P2) 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			W5		W4	
Statistics	Coverage					
	Aut1	Aut2	Spr1	Spr2	Sum1	Sum2
(5S1) Complete, read and interpret information in tables, including timetables		W5			W3	
(5S2) Solve comparison, sum and difference problems using information presented in a line graph	W6				W3	

Year 5 Mathematics Yearly Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Week 1	<u>Place value</u>	<u>Mental x and ÷ (factors, multiples)</u>	<u>Place value</u> <u>Roman numerals</u> <u>counting incl.</u> <u>negative numbers</u>	<u>Mental and written division</u>	<u>Place value</u>	<u>Place value</u>
Week 2	<u>Place value (decimals)</u>	<u>Division including problems</u>	<u>Addition and subtraction including problems</u>	<u>2D and 3D shape incl. sorting</u>	<u>Fractions</u>	<u>Written calculations</u>
Week 3	<u>Written + and – including problems</u>	<u>Fractions (compare, order, equivalence)</u>	<u>Mental and written multiplication</u>	<u>Calculating with fractions</u>	<u>Measures (time) and statistics</u>	<u>Fractions</u>
Week 4	<u>Geometry (angles)</u>	<u>Multiplication and measures (area)</u>	<u>Measures (length, mass and capacity)</u>	<u>Measures (area and volume)</u>	<u>Geometry</u>	<u>Measures (mass, volume and capacity)</u>
Week 5	<u>Geometry and measures (perimeter)</u>	<u>Statistics and measures (time)</u>	<u>Geometry (reflection and translation)</u>	<u>Statistics and measures</u>	<u>Addition and subtraction</u>	<u>Area and volume of shapes</u>
Week 6	<u>Addition and subtraction (statistics)</u>	<u>Assess and review</u>	<u>Geometry (angles)</u>	<u>Assess and review</u>	<u>Multiplication and division</u>	<u>Assess and review</u>

Year 5 Autumn 2

	Links to domain & progression	Skills	Knowledge
Week 1 <i>Mental multiplication and division</i>	5C5a 5C5b 5C5c 5C5d 5C6a 5C8a	<ul style="list-style-type: none"> Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Know and use the vocabulary of prime numbers. Establish whether a number up to 100 is prime. Recognise and use square numbers and the notation for squared (2). Use partitioning to double or halve any number, including decimals to two decimal places. Multiply and divide numbers mentally drawing upon known facts. Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method). Select a mental strategy appropriate for the numbers involved in the calculation. Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. 	<p>Children should link their knowledge of tables to enable them to identify multiples and factors. They should be able to identify factor pairs, and this can be supported through the use of practical equipment. There should be a discussion about numbers where there is only one factor pair (prime) and those numbers that have a factor pair made up of the same number (square numbers).</p> <p>They use their knowledge of partitioning numbers in different ways to support their mental calculations (e.g. 24×3 as (20×3) and (4×3) or $98 \div 7$ as $(70 \div 7)$ and $(28 \div 7)$).</p>
Week 2 <i>Division including problems</i>	5C7b 5C8a	<ul style="list-style-type: none"> 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. Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method). Solve problems involving division. 	<p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p> <p>When solving problems, these include those involving remainders and children should identify whether the answer is rounded up or down, depending on the context.</p>
Week 3 <i>Fractions (comparison, order and equivalence)</i>	5F6a 5F2b 5F3	<ul style="list-style-type: none"> Count on and back in mixed number steps such as $1\frac{1}{2}$. Read and write decimal numbers as fractions. Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Compare and order fractions whose denominators are all multiples of the same number (including on a number line). Solve problems involving fractions. 	<p>The learning of fractions is an extension in understanding of the number system. Children should relate the fractions tenths and hundredths to our Base 10 number system and link their knowledge of decimal numbers to fractions where a denominator of tenths, hundredths or thousandths is required.</p> <p>The understanding of equivalent fractions should be learned and developed through practical experiences and pictorial representations. Children should use their knowledge of factors and multiples to recognise equivalent fractions and simplify where appropriate.</p>
Week 4 <i>Multiplication and measures (area)</i>	5C7a 5M7b	<ul style="list-style-type: none"> 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. Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method). Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes. 	<p>Children should consolidate their understanding of linking area to arrays and multiplication.</p> <p>Children make links with their knowledge of rounding numbers to the nearest 10, 100 and 1000 to estimate the answers to calculations. Calculations should also be in contexts including, money, measures, real life problems and number enquiries.</p> <p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p>
Week 5 <i>Statistics and measures (time)</i>	5S1 5M4	<ul style="list-style-type: none"> Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks. Complete, read and interpret information in tables, including timetables. Solve problems involving converting between units of time. 	<p>Children's understanding of reading time to the nearest minute and converting between different time systems (analogue and digital) and different units of time is consolidated from Year 4. Children should be able to solve problems which require them to convert between units of time, for example, between seconds and minutes or weeks and days.</p>
Week 6		Assess and review week	It is useful at regular intervals for teachers to consider the learning that has taken place over a term (or half term), assess and review children's understanding of the learning and use this to inform where the children need to go next.

<p>Week 6 Geometry (angles)</p>	<p>5G4a 5G4c 5G4b 5G4b 5G4b</p>	<ul style="list-style-type: none"> • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. • Draw given angles, and measure them in degrees ($^{\circ}$). • Identify angles at a point and one whole turn (total 360°). • Identify angles at a point on a straight line and a turn (total 180°). • Identify other multiples of 90°. 	<p>Building on their knowledge that an angle is a measure of a turn and can be static or dynamic, pupils become accurate in measuring with a protractor. They use conventional markings for right angles.</p> <p>Pupils use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals, for example using dynamic geometry ICT tools including the ITP Fixing Points.</p> <p>Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems. The ITP Calculating Angles can be used for this. When calculating angles around a point, children could explore this when finding shapes that tessellate.</p>
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Year 5 Spring 2

	Links to domain & progression	Skills	Knowledge
Week 1 <i>Mental and written division</i>	5C5a 5C6a 5C7b 5C8b 5C8c	<ul style="list-style-type: none"> Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Divide numbers mentally drawing upon known facts. 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. Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method). Select a mental strategy appropriate for the numbers involved in the calculation. Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. 	<p>They should use and understand the terms factor, (numbers that divide exactly into another number) multiple and prime, square and cube numbers.</p> <p>They should apply their knowledge of multiplication and division facts up to 12 x 12 to larger numbers. When learning about division, children need to maintain the understanding that it is sharing, repeated subtraction (grouping) or linked to scaling down i.e. making an amount a number of times smaller (if the scale factor is a fraction then the amount will decrease in size).</p> <p>Children should interpret remainders in different ways, including as whole numbers, as fractions, as decimals and rounding up or down appropriate to the context.</p> <p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p>
Week 2 <i>2D and 3D shape including sorting</i>	5G2b 5G2a 5G3b	<ul style="list-style-type: none"> Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Use the properties of rectangles to deduce related facts and missing lengths and angles. Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. 	<p>Pupils continue to classify shapes using geometrical properties, extending to classifying different triangles (for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, and trapezium). This will include irregular shapes and shapes in different orientations.</p> <p>When children classify shapes, they should discuss the properties that are the same and different and use these to determine the features of a given shape.</p>
Week 3 <i>Calculating with fractions</i>	5F2a 5F4 5F2a	<ul style="list-style-type: none"> Recognise mixed numbers and improper fractions and convert from one form to the other. Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams). Write mathematical statements > 1 as a mixed number, e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$. 	<p>Children build on their understanding of fractions, applying their knowledge of mixed numbers and equivalence to convert between forms. When adding and subtracting fractions, children should be supported by diagrams to see that $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$. They should use knowledge of equivalent fractions to add and subtract fractions in which one denominator is a multiple of the other e.g. $\frac{2}{5} + \frac{9}{10} = \frac{4}{10} + \frac{9}{10} = \frac{13}{10} = 1\frac{3}{10}$</p>
Week 4 <i>Measurement (area and volume)</i>	5M7b 5M8	<ul style="list-style-type: none"> Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes. Understand the difference between liquid volume, including capacity and solid volume. Estimate (and calculate) volume (for example, using 1cm³ blocks to build cuboids (including cubes)). 	<p>Children's understanding of volume develops to include 'solid' volume and that this means the amount of space occupied by a 3-D shape whereas capacity is the maximum amount a container holds and if the container is not full then we are considering the volume of liquid it is holding. Children should learn that 1cm³ is equal to 1ml.</p> <p>Children should make links between the area of a rectangle (including squares) and the volume of cuboids (including cubes). They could explore how different cuboids can have the same volume much like rectangles with different dimensions can have the same area.</p>
Week 5 <i>Statistics, measures and calculation</i>	5M8 5C1 5C2 5C4	<ul style="list-style-type: none"> Use, read and write standard units of length and mass to a suitable degree of accuracy. Estimate and calculate capacity. Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places. Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods. Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method). Select a mental strategy appropriate for the numbers involved in the calculation. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. 	<p>By placing calculation and statistics into a measures context, it enables children to use and apply their skills. Children can apply their knowledge of calculation in the context of statistics, using all types of graph. This should be carried out in a variety of contexts, including real life scenarios. Children's work on statistics and measurement should reflect their ability in other number work in place value and calculation.</p>
Week 6		Assess and review week	It is useful at regular intervals for teachers to consider the learning that has taken place over a term (or half term), assess and review children's understanding of the learning and use this to inform where the children need to go next.

Year 5 Summer 1

	Links to domain & progression	Skills	Knowledge
Week 1 Place value including decimals	5N2 5N3a 5F8 5N1 5N4 5F7 5N6	<ul style="list-style-type: none"> Identify, represent and estimate numbers using the number line. Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. Identify the value of each digit to three decimal places. Read, write, order and compare numbers with up to three decimal places. Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. Count forwards and backwards in decimal steps. Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal. Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000. Round decimals with two decimal places to the nearest whole number and to one decimal place. Solve number problems and practical problems that involve all of the above. Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number. 	<p>Pupils identify the place value in large whole numbers. They continue to use number in context, including measurement. Pupils extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far. They should recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule. They should recognise and describe linear number sequences (for example, $3, 3\frac{1}{2}, 4, 4\frac{1}{2}, \dots$), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add $\frac{1}{2}$).</p> <p>All place value work should be presented in contexts such as measurement, statistics or other real life scenarios.</p>
Week 2 Fractions	5F2a 5F3 5F2b 5F4 5F5	<ul style="list-style-type: none"> Recognise mixed numbers and improper fractions and convert from one form to another. Compare and order fractions whose denominators are all multiples of the same number (including on a number line). Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams). Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. 	<p>Children consolidate their understanding of fractions through identifying, writing, comparing, ordering and calculating equivalent fractions, all supported through practical and visual approaches. Children's calculating with fractions involves addition and subtraction and continues to develop to include multiplying proper fractions by whole numbers e.g. $\frac{2}{5} \times 7$. All of the calculating with fractions should be supported through practical and pictorial methods.</p>
Week 3 Measures (time and converting units) and statistics	5S1 5M4 5M6 5S2	<ul style="list-style-type: none"> Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks. Complete, read and interpret information in tables, including timetables. Solve problems involving converting between units of time. Understand and use approximate equivalences between metric and common imperial units such as pints. Solve comparison, sum and difference problems using information presented in all types of graph including a line graph. 	<p>Pupils use all four operations in problems involving time, including conversions (for example, days to weeks, expressing the answer as weeks and days). They use their knowledge of the 7x table to convert days to weeks, and apply this in different contexts. Children could use their work in science or PE (athletics) to generate times to use in maths lessons. Children apply their knowledge of calculation in the context of statistics, using all types of graph. They use line graphs as a way of converting between metric and imperial units and then use these line graphs to solve problems relating to metric and everyday imperial units.</p>
Week 4 Geometry	5G2b 5G2a 5G3b 5G2b 5P2	<ul style="list-style-type: none"> Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Use the properties of rectangles to deduce related facts and missing lengths and angles. Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Describe positions on the first quadrant of a coordinate grid. Plot specified points and complete shapes. 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. 	<p>Pupils continue to classify shapes using geometrical properties, extending to classifying different triangles (for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, and trapezium). This will include irregular shapes and shapes in different orientations. When children classify shapes, they should discuss the properties that are the same and different and use these to determine the features of a given shape. Children should compare lengths and angles to decide if a polygon is regular or irregular. They then apply this knowledge (as well as other knowledge about the properties of shapes) when plotting coordinates of the corners of 2-D shapes in the first quadrant, and also when reflecting and translating shapes. Reflection should be in lines parallel to the axes.</p>
Week 5 Addition and subtraction	5C2 5C1 5C3 5C4	<ul style="list-style-type: none"> Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction). Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places. Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method). Select a mental strategy appropriate for the numbers involved in the calculation. Use rounding, estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. 	<p>Children learn when it is appropriate to use mental and written methods of calculation. Children make links with their knowledge of rounding numbers to the nearest 10, 100 and 1000 to estimate the answers to calculations. Calculations should be in contexts including, money, measures, real life problems and number enquiries.</p> <p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p>

<p>Week 6 Multiplication and division</p>	<p>5C7b</p> <p>5C6b</p> <p>5C5d</p> <p>5C8c</p>	<ul style="list-style-type: none"> • 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. • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. • Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³). • <i>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</i> • <i>Select a mental strategy appropriate for the numbers involved in the calculation.</i> • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. 	<p>They should apply their knowledge of multiplication and division facts up to 12 x 12 to larger numbers. Children need to understand what multiplication and division are and how they apply in real life situations, including scaling up and down.</p> <p>Children should interpret remainders in different ways, including as whole numbers, as fractions, as decimals and rounding up or down appropriate to the context.</p> <p>Written methods should be agreed by the school and shared in the progression in written calculations policy. Efficient written methods are required to be taught by the end of Key Stage 2.</p>
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Whole School Domain Progression

Number and place value; approximation and estimation / rounding (KS2)

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6	
N1 Counting (in multiples)	<u>Nursery Outcomes</u> Recite numbers past 5. Say one number name for each item from 1-5. Know that the last number reached when counting a set of objects tells you how many there is in total.	1N1a Count to and across 100, forward and backwards, beginning with 0 or 1, or from any given number	2N1 Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward		4N1 Count in multiples of 6, 7, 9, 25 and 1000	5N1 Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000		
	<u>Reception Outcomes (ELG)</u> Verbally count beyond 20, recognising the pattern of the counting system.	1N1b Count in multiples of twos, fives and tens		3N1b Count from 0 in multiples of 4, 8, 50 and 100				
N2 Read, write, order and compare numbers	<u>Nursery Outcomes</u> Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals.	1N2a Count, read and write numbers to 100 in numerals	2N2a Read and write numbers to at least 100 in numerals and in words	3N2a Compare and order numbers up to 1000 Read and write numbers to 1000 in numerals and in words	4N2a Order and compare numbers beyond 1000	5N2 Read, write, order and compare numbers to at least 1 000 000	6N2 Read, write, order and compare numbers up to 10 000 000	
	<u>Reception Outcome</u> Link the number symbol (numeral) with its cardinal number value. (1-10)							
	<u>Nursery Outcomes</u> Compare quantities saying 'lots' 'more' and 'same'.	1N2b Given a number, identify one more and one less	2N2b Compare and order numbers from 0 up to 100; use <, > and = signs	3N2b Find 10 or 100 more or less than a given number	4N2b Find 1000 more or less than a given number			
	<u>Reception Outcomes (ELG)</u> Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	1N2c Read and write numbers from 1 to 20 in numerals and words						
N3 Place value; Roman numerals			2N3 Recognise the place value of each digit in a two-digit number (tens, ones)	3N3 Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	4N3a Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones)	5N3a Determine the value of each digit in numbers up to 1 000 000	6N3 Determine the value of each digit in numbers up to 10 000 000	
					4N3b Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the	5N3b Read Roman numerals to 1000 (M) and recognise years written in Roman numerals		

					concept of zero and place value		
N4 Identify, represent and estimate; rounding	<u>Nursery Outcomes</u> Show 'finger numbers' up to 5. Subitise up to 3 objects. Link numerals and amounts: for example, showing the right number of objects up to 5.	1N4 Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least	2N4 Identify, represent and estimate numbers using different representations, including the number line	3N4 Identify, represent and estimate numbers using different representations	4N4a Identify, represent and estimate numbers using different representations	5N4 Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	6N4 Round any whole number to a required degree of accuracy
	<u>Reception Outcome (ELG)</u> Link numeral with cardinal number value (1-10) Subitise (recognise quantities without counting) up to 5				4N4b Round any number to the nearest 10, 100 or 1000		
N5 Negative numbers					4N5 Count backwards through zero to include negative numbers	5N5 Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	6N5 Use negative numbers in context, and calculate intervals across zero
N6 Number problems			2N6 Use place value and number facts to solve problems	3N6 Solve number problems and practical problems involving 3N1–3N5	4N6 Solve number and practical problems that involve 4N1–4N5 and with increasingly large positive numbers	5N6 Solve number problems and practical problems that involve 5N1–5N5	6N6 Solve number problems and practical problems that involve 6N2–6N5

Addition, subtraction, multiplication and division (calculations)

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
C1 Add / subtract mentally	<u>Reception Outcome (ELG)</u> Automatically recall number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	1C1 Represent and use number bonds and related subtraction facts within 20	2C1a Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	3C1 Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds		5C1 Add and subtract numbers mentally with increasingly large numbers	
			2C1b Add and subtract numbers mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers				
		1C2a	2C2	3C2	4C2	5C2	

C2 Add / subtract using written methods		Add and subtract one-digit and two-digit numbers to 20, including zero	Add and subtract numbers using concrete objects and pictorial representations, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
		1C2b Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs					
C3 Estimate, use inverses and check			2C3 To recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems	3C3 Estimate the answer to a calculation and use inverse operations to check answers	4C3 Estimate and use inverse operations to check answers to a calculation	5C3 Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	6C3 Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
C4 Add/subtract to solve problems		1C4 Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$	2C4 Solve problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods	3C4 Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	4C4 Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	5C4 Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	6C4 Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
C5 Properties of number (multiples, factors, primes, squares and cubes)						5C5a Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers	6C5 Identify common factors, common multiples and prime numbers
						5C5b Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	
						5C5c Establish whether a number up to 100 is prime and recall prime numbers up to 19	
						5C5d Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	
C6			2C6 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables,	3C6 Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	4C6a Recall multiplication and division facts for multiplication tables up to 12×12	5C6a Multiply and divide numbers mentally drawing upon known facts	6C6 Perform mental calculations, including with mixed operations and large numbers

Multiply / divide mentally			including recognising odd and even numbers				
					4C6b 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	5C6b Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	
					4C6c Recognise and use factor pairs and commutativity in mental calculations		
C7 Multiply / divide using written methods			2C7 Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs	3C7 Write and calculate mathematical statements for multiplication and division using the multiplication tables that children know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	4C7 Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	5C7a 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	6C7a Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
						5C7b 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	6C7b 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
							6C7c 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
C8 Solve problems (commutative, associative, distributive and all four operations)	Nursery Outcomes Solve some real-world mathematical problems with numbers up to 5, Reception Outcomes (ELG) Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.	1C8 Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	2C8 Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	3C8 Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects	4C8 Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	5C8a Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	6C8 Solve problems involving addition, subtraction, multiplication and division
						5C8b	

						Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	
						5C8c Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates	
C9 Order of operations			2C9a Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				6C9 Use their knowledge of the order of operations to carry out calculations involving the four operations
			2C9b Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot				

Fractions, decimals and percentages

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
F1 Recognise, find, write, name and count fractions	Reception Outcomes Halving and sharing objects practically.	1F1a Recognise, find and name a half as one of two equal parts of an object, shape or quantity	2F1a Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	3F1a 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	4F1 Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten		
		1F1b Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	2F1b Write simple fractions [e.g.: $\frac{1}{2}$ of 6 = 3]	3F1b Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators			
				3F1c Recognise and use fractions as numbers:			

				unit fractions and non-unit fractions with small denominators			
F2 Equivalent fractions			2F2 Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	3F2 Recognise and show, using diagrams, equivalent fractions with small denominators	4F2 Recognise and show, using diagrams, families of common equivalent fractions	5F2a Recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements >1 as a mixed number [e.g.: $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$]	6F2 Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
						5F2b Identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	
F3 Comparing and ordering fractions				3F3 Compare and order unit fractions and fractions with the same denominators		5F3 Compare and order fractions whose denominators are all multiples of the same number	6F3 Compare and order fractions, including fractions >1
F4 Add / subtract fractions				3F4 Add and subtract fractions with the same denominator within one whole [e.g.: $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]	4F4 Add and subtract fractions with the same denominator	5F4 Add and subtract fractions with the same denominator and denominators that are multiples of the same number	6F4 Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
F5 Multiply / divide fractions						5F5 Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	6F5a Multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g.: $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
							6F5b Divide proper fractions by whole numbers [e.g.: $\frac{1}{3} \div 2 = \frac{1}{6}$]
F6 Fractions / decimals equivalence					4F6a Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	5F6a Read and write decimal numbers as fractions [e.g.: $0.71 = \frac{71}{100}$]	6F6 Associate a fraction with division to calculate decimal fraction equivalents (e.g.: 0.375) for a simple fraction [e.g.: $\frac{3}{8}$]
					4F6b Recognise and write decimal equivalents of any number of tenths or hundredths	5F6b Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
F7 Rounding decimals [KS2]					4F7 Round decimals with one decimal place to the nearest whole number	5F7 Round decimals with two decimal places to the nearest whole number and to one decimal place	

F8 Compare and order decimals					4F8 Compare numbers with the same number of decimal places up to two decimal places	5F8 Read, write, order and compare numbers with up to three decimal places	
F9 Multiply / divide decimals					4F9 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		6F9a Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
							6F9b Multiply one-digit numbers with up to two decimal places by whole numbers
							6F9c Use written division methods in cases where the answer has up to two decimal places
F10 Solve problems with fractions and decimals				3F10 Solve problems that involve 3F1–3F4	4F10a 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	5F10 Solve problems involving numbers up to three decimal places	6F10 Solve problems which require answers to be rounded to specified degrees of accuracy
					4F10b Solve simple measure and money problems involving fractions and decimals to two decimal places		
F11 Fractions / decimal / percentage equivalence						5F11 Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; write percentages as a fraction with denominator hundred, and as a decimal	6F11 Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
F12 Solve problems with percentages						5F12 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	

Ratio and proportion

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
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Enumerate all possibilities of combinations of							Enumerate possibilities of combinations of two variables
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Measurement

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
M1 Compare, describe and order measures	<u>Reception Outcomes</u> Make comparisons between 2 objects relating to their size, length, weight and capacity. <u>Reception Outcomes</u> Compare length, weight and capacity.	1M1 Compare, describe and solve practical problems for: <ul style="list-style-type: none"> - lengths and heights [e.g.: long/short, longer/ shorter, tall/short, double/half] - mass/weight [e.g.: heavy/light, heavier than, lighter than] - capacity and volume [e.g.: full/empty, more than, less than, half, half full, quarter] - time [e.g.: quicker, slower, earlier, later] 	2M1 Compare and order lengths, mass, volume/ capacity and record the results using >, < and =	3M1a Compare lengths(m/cm/mm)	4M1 Compare different measures, including money in pounds and pence		
				3M1b Compare mass (kg/g)			
				3M1c Compare volume / capacity (l/ml)			
M2 Estimate, measure and read scales		1M2 Measure and begin to record the following: <ul style="list-style-type: none"> - lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds) 	2M2 Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit using rulers, scales, thermometers and measuring vessels	3M2a Measure lengths (m/cm/mm)	4M2 Estimate different measures, including money in pounds and pence		
				3M2b Measure mass (kg/g)			
				3M2c Measure volume / capacity (l/ml)			
M3 Money	<u>Reception Outcome</u> To use everyday language related to money.	1M3 Recognise and know the value of different denominations of coins and notes	2M3a Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value				
			2M3b Find different combinations of coins that equal the same amounts of money				
M4	<u>Reception Outcome</u> To use everyday language related to time.	1M4a Tell the time to the hour and half past the hour and draw	2M4a Tell and write the time to five minutes, including quarter	3M4a	4M4a		

Telling time, ordering time, duration and units of time		the hands on a clock face to show these times	past/to the hour and draw the hands on a clock face to show these times	Tell and write the time from an analogue clock; 12-hour clocks	Read, write and convert time between analogue and digital 12-hour clocks			
		1M4b Sequence events in chronological order using language [e.g.: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	2M4b Compare and sequence intervals of time	3M4b Tell and write the time from an analogue clock; 24-hour clocks	4M4b Read, write and convert time between analogue and digital 24-hour clocks			
		1M4c Recognise and use language relating to dates, including days of the week, weeks, months and years	2M4c Know the number of minutes in an hour and the number of hours in a day	3M4c Tell and write the time from an analogue clock, including using Roman numerals from I to XII	4M4c Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	5M4 Solve problems involving converting between units of time		
				3M4d 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/a.m./p.m., morning, afternoon, noon and midnight				
				3M4e Know the number of seconds in a minute and the number of days in each month, year and leap year				
				3M4f Compare durations of events, [e.g.: to calculate the time taken by particular events or tasks]				
M5 Convert between metric units					4M5 Convert between different units of measurement [e.g.: kilometre to metre; hour to minute]	5M5 Convert between different units of metric measure [e.g.: kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]	6M5 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 of up to three decimal places	
M6 Convert metric/imperial						5M6 Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	6M6 Convert between miles and kilometres	
M7 Perimeter, area				3M7 Measure the perimeter of simple 2-D shapes	4M7a Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	5M7a Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	6M7a Recognise that shapes with the same areas can have different perimeters and vice versa	

					4M7b Find the area of rectilinear shapes by counting squares	5M7b Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes	6M7b Calculate the area of parallelograms and triangles
							6M7c Recognise when it is possible to use the formulae for the area of shapes
M8 Volume						5M8 Estimate volume [e.g.: using 1cm ³ blocks to build cuboids (including cubes)] and capacity [e.g.: using water]	6M8a Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm ³) and cubic metres (m ³), and extending to other units [e.g.: mm ³ and km ³]
							6M8b Recognise when it is possible to use the formulae for the volume of shapes
M9 Solve problems (a: money; b: length; c: mass / weight; d: capacity / volume)			2M9 Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	3M9a Add and subtract amounts of money to give change, using both £ and p in practical contexts	4M9 Calculate different measures, including money in pounds and pence	5M9a Use all four operations to solve problems involving measure [money] using decimal notation, including scaling	6M9 Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
				3M9b Add and subtract lengths (m/cm/mm)		5M9b Use all four operations to solve problems involving measure [e.g.: length] using decimal notation, including scaling	
				3M9c Add and subtract mass (kg/g)		5M9c Use all four operations to solve problems involving measure [e.g.: mass] using decimal notation, including scaling	
				3M9d Add and subtract volume / capacity (l/ml)		5M9d Use all four operations to solve problems involving measure [e.g.: volume] using decimal notation, including scaling	

Geometry: properties of shape

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
G1 Recognise and name common shapes	Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'. Shows interest in shape by sustained construction activity or by talking about shapes or arrangements. Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'flat'.	1G1a Recognise and name common 2-D shapes [e.g.: rectangles (including squares), circles and triangles]	2G1a Compare and sort common 2-D shapes and everyday objects				
		1G1b Recognise and name common 3-D shapes [e.g.: cuboids (including cubes), pyramids and spheres]	2G1b Compare and sort common 3-D shapes and everyday objects				
G2 Describe properties and classify shapes			2G2a Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line	3G2 Identify horizontal, vertical lines and pairs of perpendicular and parallel lines	4G2a Compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes	5G2a Use the properties of rectangles to deduce related facts and find missing lengths and angles	6G2a Compare and classify geometric shapes based on their properties and sizes
			2G2b Identify and describe the properties of 3-D shapes including the number of edges, vertices and faces		4G2b Identify lines of symmetry in 2-D shapes presented in different orientations	5G2b Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	6G2b Describe simple 3-D shapes
					4G2c Complete a simple symmetric figure with respect to a specific line of symmetry		
G3 Draw and make shapes and relate 2-D to 3-D shapes (including nets)			2G3 Identify 2-D shapes on the surface of 3-D shapes, [e.g.: a circle on a cylinder and a triangle on a pyramid]	3G3a Draw 2-D shapes			6G3a Draw 2-D shapes using given dimensions and angles
				3G3b Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them		5G3b Identify 3-D shapes including cubes and other cuboids, from 2-D representations	6G3b Recognise and build simple 3D shapes, including making nets
G4 Angles – measuring and properties				3G4a Recognise that angles are a property of shape or a description of a turn	4G4 Identify acute and obtuse angles and compare and order angles up to two right angles by size	5G4a Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	6G4a Find unknown angles in any triangles, quadrilaterals and regular polygons
				3G4b Identify right angles, recognise that two right		5G4b Identify:	6G4b Recognise angles where they meet at a point, are on a

				angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle		<ul style="list-style-type: none"> - angles at a point and one whole turn (total 360°) - angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90° 	straight line, or are vertically opposite, and find missing angles
						5G4c Draw given angles and measure them in degrees (°)	
G5 Circles							6G5 Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

Geometry: position and direction

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
P1 Patterns	Talk about patterns in the environment. For example, stripes on clothes. Use informal language like 'pointy', 'spotty'. Continue, copy and create repeating patterns.		2P1 Order and arrange combinations of mathematical objects in patterns and sequences				
P2 Describe position, direction and movement	Understand positional language with focus on under, over, behind, in front, forwards, backwards.	1P2 Describe position, directions and movement, including half, quarter and three-quarter turns	2P2 Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clock-wise and anti-clockwise)		4P2 Describe movements between positions as translations of a given unit to the left/right and up/down	5P2 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	6P2 Draw and translate simple shapes on the co-ordinate plane, and reflect them in the axes
P3 Coordinates					4P3a Describe positions on a 2-D grid as co-ordinates in the first quadrant		6P3 Describe positions on the full co-ordinate grid (all four quadrants)
					4P3b Plot specified points and draw sides to complete a given polygon		

Statistics

Strand	Early Years outcomes	National Curriculum reference Year 1	National Curriculum reference Year 2	National Curriculum reference Year 3	National Curriculum reference Year 4	National Curriculum reference Year 5	National Curriculum reference Year 6
S1 Interpret and represent data			2S1 Interpret and construct simple pictograms, tally charts, block diagrams and simple tables	3S1 Interpret and present data using bar charts, pictograms and tables	4S1 Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	5S1 Complete, read and interpret information in tables, including timetables	6S1 Interpret and construct pie charts and line graphs and use these to solve problems
S2 Solve problems involving data			2S2a Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	3S2 Solve one-step and two step questions [e.g.: 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts, pictograms and tables	4S2 Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	5S2 Solve comparison, sum and difference problems using information presented in a line graph	
			2S2b Ask and answer questions about totalling and comparing categorical data				
S3 Mean average							6S3 Calculate and interpret the mean as an average

National Curriculum

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/381344/Master_final_national_curriculum_28_Nov.pdf

Year 5 programme of study

Number – number and place value

Statutory requirements

Pupils should be taught to:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit;
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000;
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero;
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000;
- solve number problems and practical problems that involve all of the above;
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals.

Notes and guidance (non-statutory)

Pupils identify the place value in large whole numbers.

They continue to use number in context, including measurement. Pupils extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far.

They should recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule.

They should recognise and describe linear number sequences (for example, $3, 3\frac{1}{2}, 4, 4\frac{1}{2}, \dots$), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add $\frac{1}{2}$).

Number – addition and subtraction

Statutory requirements

Pupils should be taught to:

- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction);
- add and subtract numbers mentally with increasingly large numbers;
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy;
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. (*from Year 6*)

Notes and guidance (non-statutory)

Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency (see Mathematics Appendix 1).

They practise mental calculations with increasingly large numbers to aid fluency (for example, $12\,462 - 2300 = 10\,162$).

Statutory requirements

Pupils should be taught to:

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers; *(from Year 6)*
- establish whether a number up to 100 is prime and recall prime numbers up to 19; *(from Year 6)*
- 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; *(from Year 6)*
- multiply and divide numbers mentally drawing upon known facts;
- 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;
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000;
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3);
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes;
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign;
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Notes and guidance (non-statutory)

Pupils practise and extend their use of the formal written methods of short multiplication and short division (see Mathematics Appendix 1). They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.

They use and understand the terms factor, multiple and prime, square and cube numbers.

Pupils interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, $98 \div 4 = \frac{98}{4} = 24 \text{ r } 2 = 24\frac{1}{2} = 24.5 \approx 25$).

Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.

Distributivity can be expressed as $a(b + c) = ab + ac$.

They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, $4 \times 35 = 2 \times 2 \times 35$; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 9^2 \times 10$).

Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, $13 + 24 = 12 + 25$; $33 = 5 \times \square$).

Number – fractions (including decimals and percentages)

Statutory requirements

Pupils should be taught to:

- compare and order fractions whose denominators are all multiples of the same number; (*from Year 6*)
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths;
- 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$];
- add and subtract fractions with the same denominator and denominators that are multiples of the same number;
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams;
- read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$];
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents; (*from Year 6*)
- round decimals with two decimal places to the nearest whole number and to one decimal place;
- read, write, order and compare numbers with up to three decimal places; (*from Year 6*)
- solve problems involving number up to three decimal places; (*from Year 6*)
- 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;
- 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.

Notes and guidance (non-statutory)

Pupils should be taught throughout that percentages, decimals and fractions are different ways of expressing proportions.

They extend their knowledge of fractions to thousandths and connect to decimals and measures.

Pupils connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions.

Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1 .

Pupils practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems. They extend their understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number.

Pupils continue to practise counting forwards and backwards in simple fractions.

Pupils continue to develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities.

Pupils extend counting from year 4, using decimals and fractions including bridging zero, for example on a number line.

Pupils say, read and write decimal fractions and related tenths, hundredths and thousandths accurately and are confident in checking the reasonableness of their answers to problems.

They mentally add and subtract tenths, and one-digit whole numbers and tenths.

They practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, $0.83 + 0.17 = 1$).

Pupils should go beyond the measurement and money models of decimals, for example, by solving puzzles involving decimals.

Pupils should make connections between percentages, fractions and decimals (for example, 100% represents a whole quantity and 1% is $\frac{1}{100}$, 50% is $\frac{50}{100}$, 25% is $\frac{25}{100}$) and relate this to finding 'fractions of'.

Measurement

Statutory requirements

Pupils should be taught to:

- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre);
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints; (*from Year 6*)
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres;
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes; (*from Year 6*)
- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water];
- solve problems involving converting between units of time;
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Notes and guidance (non-statutory)

Pupils use their knowledge of place value and multiplication and division to convert between standard units.

Pupils calculate the perimeter of rectangles and related composite shapes, including using the relations of perimeter or area to find unknown lengths. Missing measures questions such as these can be expressed algebraically, for example $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm.

Pupils calculate the area from scale drawings using given measurements.

Pupils use all four operations in problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days).

Geometry – properties of shapes

Statutory requirements

Pupils should be taught to:

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations;
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles; (*from Year 6*)
- draw given angles, and measure them in degrees ($^{\circ}$);
- identify:
 - angles at a point and one whole turn (total 360°); (*from Year 6*)
 - angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°);
 - other multiples of 90° ;
- use the properties of rectangles to deduce related facts and find missing lengths and angles;
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Notes and guidance (non-statutory)

Pupils become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor. They use conventional markings for parallel lines and right angles.

Pupils use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals, for example using dynamic geometry ICT tools.

Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.

Geometry – position and direction

Statutory requirements

Pupils should be taught to:

- 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.

Notes and guidance (non-statutory)

Pupils recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes.

Statistics

Statutory requirements

Pupils should be taught to:

- solve comparison, sum and difference problems using information presented in a line graph;
- complete, read and interpret information in tables, including timetables.

Notes and guidance (non-statutory)

Pupils connect their work on coordinates and scales to their interpretation of time graphs.

They begin to decide which representations of data are most appropriate and why.