Malvern Wyche C of E Primary School Mathematics Education Document

Together We Soar

1 Mathematics Vision

At the Wyche, our motto is 'Together we Soar', based on the verse from Isaiah "they will soar on wings like eagles". In Maths, this means we want children to experience the power and enjoyment of mathematics and develop a positive attitude towards their learning to create their mathematical tools for life. We strive for our children to become fluent in basic mathematical concepts, including multiplication, as this will enable our children to achieve confidence and competency in mathematics. They will be able to apply this knowledge to answer more complex reasoning and problem-solving questions.

1.1 Mathematics at The Wyche will:

- Develop children fluency, reasoning and problem-solving skills
- Develop children's understanding of conceptual and procedural knowledge.
- Give children opportunities to apply their mathematical knowledge to different contexts and make links between their learning.
- Ensure that pupils can communicate their understanding to peers and adults, drawing on images and models to support where needed.
- Equip pupils with the necessary Mathematical knowledge and skills to prepare them for the next stages of education and employment.

1.2 Relevance of Christian Values in Mathematics

Safety	*Trust*	*Respect*	*Inspiration*	*Value*	*Engagement*
We will create a safe risk-taking environment where children can attempt new mathematical problems with support and respect. Safe classroom environments are fostered to ensure that children are able to explore concepts and discuss mathematical ideas with peers.	We will trust each other as we explore a new language and put our trust in teachers and resources to enable us to learn. Children will trust in the safe environment to share their mathematical ideas, learn from their mistakes and honestly peer and self-mark.	We will create a respectful classroom where children are keen to explore mathematical concepts and listen to peers to discuss maths. Children will be encouraged to use correct mathematical when talking about concepts.	We will seek inspiration from new mathematical vocabulary, ideas and famous mathematicians. Children will be encouraged to share their methods of calculation so that others can learn from them.	We will not only value our lessons and opportunities but also celebrate mathematics. Children will be encouraged to value maths concepts and understand the part they play in everyday life.	We will take parts in lessons, attempt multi-step problems, be prepared to make mistakes and join in with pairs mathematical talk. We will engage with mathematical vocabulary and will commit to working outside of our comfort zone to overcome fear.

2 Mathematics Curriculum

2.1 White Rose Maths

We will follow White Rose maths as our yearly overviews, using the small steps planning. However, this will be used as a guide and teachers will adapt the small steps or combine steps where appropriate, it is noted that some of the White Rose small steps are non-statutory.

On Friday, mathematics is taught as mixed-year age groups and with the units focusing on shape, space and measures, this is to ensure full coverage whilst allowing recapping and moving learning forward. To provide adequate time for developing key skills in fluency, reasoning and problem solving, each class teacher will provide at least five daily mathematics lessons per week. This may vary in length but will usually last for about 45 to 60 minutes. Additional mathematics may be taught within other subject lessons when appropriate.

White Rose Progression

2.2 Times Tables and Number Bonds

At the Wyche, we believe that through a variety of interactive, visual and engaging techniques, all children can achieve the full multiplication tables knowledge by the time they leave Primary School. The new National Curriculum (2014) states that by the end of year 4, pupils should be able to recall multiplication and division facts for multiplication tables up to 12x12. Children in Year 4 are also required to take a multiplication tables check (MTC) in the Summer Term. The purpose of the check is to determine whether pupils can fluently recall their times tables up to 12, which is essential for future success in mathematics. This means it is important for the children to learn their multiplication tables facts and to be able to recall them quickly and accurately.

Information about the MTC check can be found here.

We teach times tables using the following progression:

Year 1 – Be able to count in multiples of twos, fives and tens

Year 2 - Be able to recall 2, 5 and 10 multiplication and division facts

Year 3 - Be able to recall 3, 4 and 8 multiplication and division facts

Year 4 - Be able to recall 6, 7 and 9 multiplication and division facts

Year 5/6 - application of multiplication and division facts to problem solving

To support children's learning of multiplication tables we teach multiplication and division facts, and the children have access to Times Tables Rockstars. This is an online resource that Years 2-6 use to aid the teaching and fluency of multiplication and division facts.

In Key Stage 1, the children are taught number bonds to 5, 10 and 20, this is a useful skill as children are able to split numbers in a variety of ways. It is an essential skill needed to forge number sense for children to move to addition and subtraction. As homework, children are set number bonds each week to consolidate their skills and so that parents and carers are informed of their child's progress.

3 Pedagogy: Learning & Teaching Mathematics

3.1 Maths will be taught as a discrete subject across the school. Key Stage 2 teach maths from 9:05 to 10:05 and Key Stage 1 teach maths after morning break. Mathematics will be taught by all staff in the following way:

- Using 'White Rose Maths' scheme as a guide to direct mathematical teaching but not drive it.
- Using 'White Rose Maths' and other resources to ensure that concepts are taught for all to achieve.
- Selecting the most appropriate methods and strategies following the calculation policy
- Using concrete and pictorial representations to help develop procedural and conceptual knowledge alongside fluency.
- Selecting tasks that carefully to consider the variation of approaches which enable all pupils to achieve and help strengthen mathematical understanding. There is a blended approach to recording mathematics children are encouraged to write in their maths books using the squares appropriately, however, at times sheets will be more appropriate and the staff will decide. In addition, some children will record their mathematics on sheets due to their needs.
- There will be a variation of questions within fluency which build understanding of underlying mathematical concepts and that meet the needs of their children.
- Precise questioning in class to test conceptual and procedural knowledge, which means continually assessing pupils to identify those requiring intervention, so that all pupils keep up.
- A large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention, not in content. All staff will carefully scaffold and question learners to challenge children at their level. This means more demanding questions for higher attainers.
- If some individual children who are working significantly below the majority of the class, learning at an appropriate level will be taught as part of alternative provision, mostly through 1:1.

3.2 Children will explore knowledge, understanding and language of Mathematics through:

- Concepts often being explored together (as a whole class) to make mathematic relationships explicit and strengthen mathematical understanding
- Being encouraged to communicate their understanding of maths, so that it clarifies their thinking at every opportunity and opportunities to use the correct language
- Real-life contexts (where possible) should be used to immerse pupils into the learning, this maybe in the form of problem solving and reasoning with a real purpose.
- Opportunities to explore mathematics through outdoor activities and play

3.3 Maths in EYFS

In EYFS, teachers ensure the children learn through a mixture of adult led activities and child-initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach using material from White Rose Maths and Numberblocks. The children have a wide range of structured play resources available to them throughout the year - this is known as "continuous provision". The staff model the use of these resources and the appropriate

mathematical language as they support the children in their play. We want our children to make good progress toward Early Learning Goals, be confident in communicating their ideas about maths and to develop a positive attitude towards maths from an early age.

4 Assessment and Monitoring

Assessment in Maths will establish the extent to which children are gaining and retaining Math knowledge, skills, fluency and language. This will be done through a range of techniques in line with our assessment policy, but which will include most, but not all:

- Formative assessments- questioning, observing and discussing
- White Rose Maths end of unit quizzes
- Times Table Rock Star- multiplication fluency
- Number bonds quizzes
- Multiplication Times table Check (end of Year 4)
- HeadStart Arithmetic Assessment- termly Y2-Y6
- HeadStart Reasoning Assessment- termly Y2-Y6
- HeadStart Arithmetic Assessment- end of Summer term- Y1
- HeadStart Reasoning Assessment- end of Summer term- Y1

Monitoring

- Internal multiplication checks monitored by Maths lead
- Maths outcomes monitored at Pupil Progress Meetings by Assessment Lead
- 3 x year book looks- October, February and May
- Internal monitoring of Times Table Rock Stars monitored by Maths Lead
- 3x a year pupil voice to gather an accurate picture of what children can remember about specific mathematical concepts and how knowledge is built across the year groups.

National Curriculum Statutory Objectives

Key Stage 1

	Number- Number and place value	Number- addition and subtraction	Number- multiplication and division	Number- fractions	Measurement	Geometry- properties of shapes	Geometry- position and direction
Year 1	- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number - count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s - given a number, identify 1 more and 1 less - 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 - read and write numbers from 1 to 20 in numerals and words	- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs - represent and use number bonds and related subtraction facts within 20 - add and subtract one-digit and two-digit numbers to 20, including 0 - solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9	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	- recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity - recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	- compare, describe and solve practical problems for: lengths and heights mass/weight capacity and volume Time - Measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) - recognise and know the value of different denominations of coins and notes - sequence events in chronological order using language - recognise and use language relating to dates, including days of the week, weeks, months and years - tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	- recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	describe position, direction and movement, including whole, half, quarter and three-quarter turns
Year 2	count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward	- solve problems with addition and subtraction: - using concrete objects and	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd	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	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,	identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line	order and arrange combinations of mathematical objects in patterns and sequences

• recognise the place value of each digit in a two-digit number (10s, 1s)
 	
• identify, represent and estimate numbers using different representations, including the number line
 	
• compare and order numbers from 0 up to 100; use <, > and = signs
 	
• read and write numbers to at least 100 in numerals and in words
 	
• use place value and number facts to solve problems
	pictorial representations
	
	• applying their increasing knowledge of mental and written methods
	
	• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
	
	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
	
	  • a two-digit number and 1s
	
	  • a two-digit number and 10s
	
	  • 2 two-digit numbers
	
	  • adding 3 one-digit numbers
	
	• show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
	
	• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
		and even numbers
		
		• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
		
		• show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
		
		• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
			• write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	scales, thermometers and measuring vessels
				
				• compare and order lengths, mass, volume/capacity and record the results using >, < and =
				
				• recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
				
				• find different combinations of coins that equal the same amounts of money
				
				• solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
				
				• compare and sequence intervals of time
				
				• tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
				
				• know the number of minutes in an hour and the number of hours in a day
					• identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
					
					• identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
					
					• compare and sort common 2-D and 3-D shapes and everyday objects
						• 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 (clockwise and anti-clockwise)

Key Stage 2

	Number- number and place value	Number- addition and subtraction	Number- multiplication and division	Number- fractions	Measurement	Geometry- properties of shapes	Geometry- position and direction	Statistics	Ratio/Algebra

Year 3	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
	• recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)
	• compare and order numbers up to 1,000
	• identify, represent and estimate numbers using different representations
	• read and write numbers up to 1,000 in numerals and in words
	• solve number problems and practical problems involving these ideas
		• add and subtract numbers mentally, including:
		  o a three-digit number and 1s
		  o a three-digit number and 10s
		  o a three-digit number and 100s
		• add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
		• estimate the answer to a calculation and use inverse operations to check answers
		• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction
			• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
			• 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
			• solve problems, including missing number problems, involving multiplication and division
				• 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
				• recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
				• recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
				• recognise and show, using diagrams, equivalent fractions with small denominators
				• add and subtract fractions with the same denominator within one whole
					• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
					• measure the perimeter of simple 2-D shapes
					• add and subtract amounts of money to give change, using both £ and p in practical contexts
					• tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
					• 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
						• draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
						• recognise angles as a property of shape or a description of a turn
						• 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
						• identify horizontal and vertical lines and pairs of perpendicular and parallel lines
								• interpret and present data using bar charts, pictograms and tables
								• solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables	

				• compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above	• know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events				
Year 4	• count in multiples of 6, 7, 9, 25 and 1,000 • find 1,000 more or less than a given number • count backwards through 0 to include negative numbers • recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) • order and compare numbers beyond 1,000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1,000	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	• recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding,	• recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 • 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 • add and subtract fractions with the same denominator	• convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to	• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to 2 right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry	• describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon	• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	

	• solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value		including using the distributive law to multiply two-digit numbers by 1 digit	• recognise and write decimal equivalents of any number of tenths or hundreds • recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ • 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 • round decimals with 1 decimal place to the nearest whole number • compare numbers with the same number of decimal places up to 2 decimal places • solve simple measure and money problems involving fractions and decimals to 2 decimal places	minutes, minutes to seconds, years to months, weeks to days				
Year 5	• read, write, order and compare numbers to at least 1,000,000	• add and subtract whole numbers with more than 4 digits, including using formal	• identify multiples and factors, including finding all	• compare and order fractions whose denominators are all	• convert between different units of metric measure [for example, kilometre and	• identify 3-D shapes, including cubes and other cuboids, from 2-D representations	• identify, describe and represent the	• solve comparison, sum and difference problems	

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 0 • round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	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	factor pairs of a number, and common factors of 2 numbers • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • 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 • 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	multiples of the same number • 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	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 • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes • estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for	• know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (°) • identify: o angles at a point and 1 whole turn (total 360°) o angles at a point on a straight line and half a turn (total 180°) o other multiples of 90° o use the properties of rectangles to deduce related facts and find missing lengths and angles o distinguish between regular and irregular polygons based on reasoning about equal sides and angles	position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	using information presented in a line graph • complete, read and interpret information in tables, including timetables	

			- multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 - 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	fractions [for example, 0.71 $= \dfrac{71}{100}$] - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents - round decimals with 2 decimal places to the nearest whole number and to 1 decimal place - read, write, order and compare numbers with up to 3 decimal places - solve problems involving number up to 3 decimal places - recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction - solve problems which require knowing percentage and decimal equivalents of	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				

		$\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25	

Year 6									
• read, write, order and compare numbers up to 10,000,000 and determine the value of each digit • round any whole number to a required degree of accuracy • use negative numbers in context, and calculate intervals across 0 • solve number and practical problems that involve all of the above	• multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • 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 • 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 • perform mental calculations, including with mixed operations and large numbers • identify common factors, common multiples and prime numbers • use their knowledge of the order of operations to carry out calculations involving the 4 operations • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions >1 • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]	• solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate • 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 • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes	• draw 2-D shapes using given dimensions and angles • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	• describe positions on the full coordinate grid (all 4 quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes	• interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average	**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 • solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison • solve problems involving similar shapes	

			• associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • 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 • multiply one-digit numbers with up to 2 decimal places by whole numbers • use written division methods in cases where the answer has up to 2 decimal places • solve problems which require answers to be rounded to specified degrees of accuracy • recall and use equivalences between simple	• calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other unit				where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples **Algebra** • use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with 2 unknowns • enumerate possibilities of combinations of 2 variables

			fractions, decimals and percentages, including in different contexts					