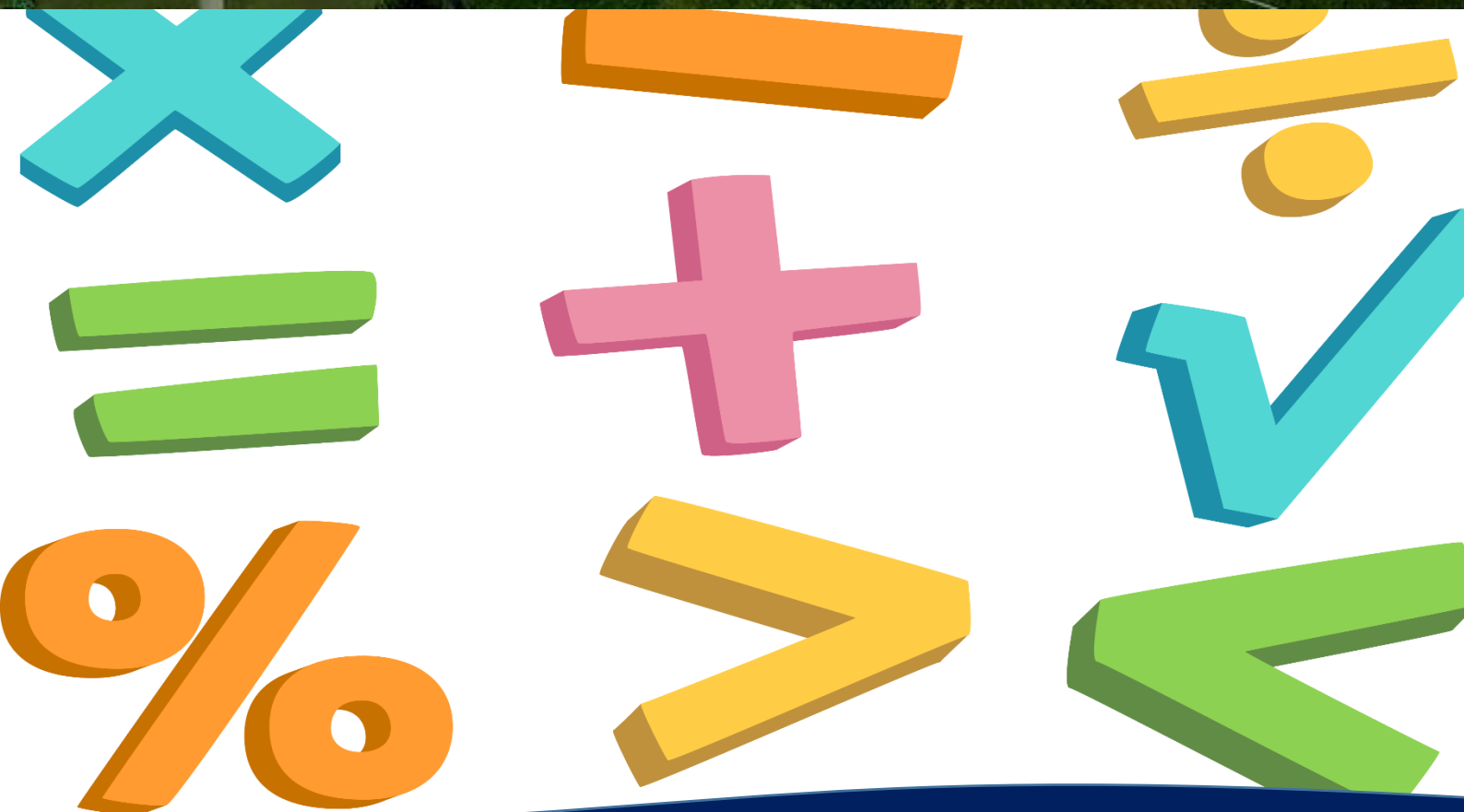
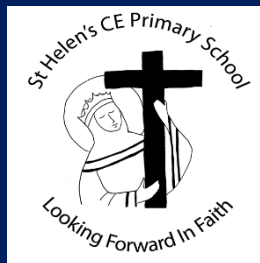


# St Helen's CE Primary School



## Maths Curriculum

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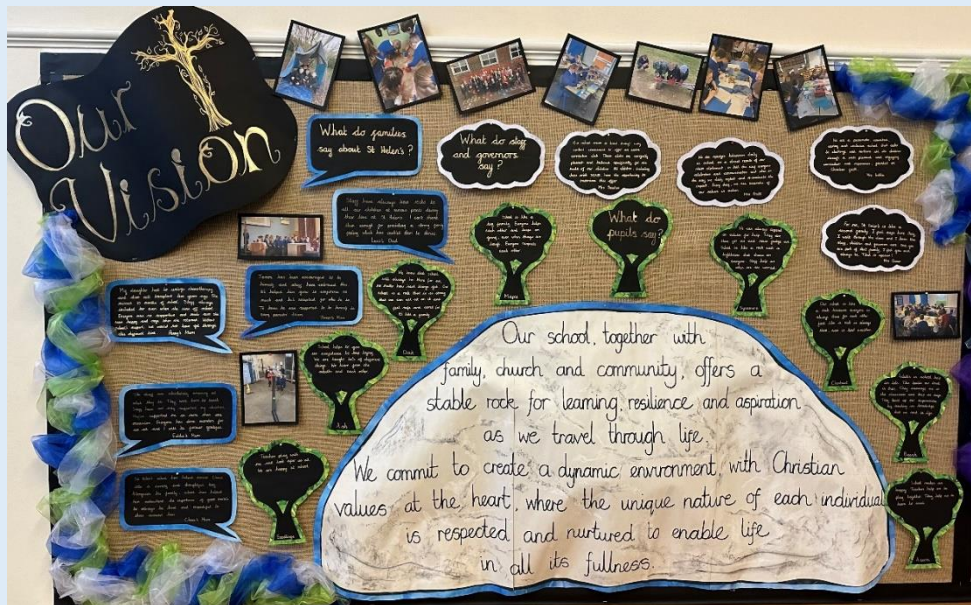
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# School Vision & Values

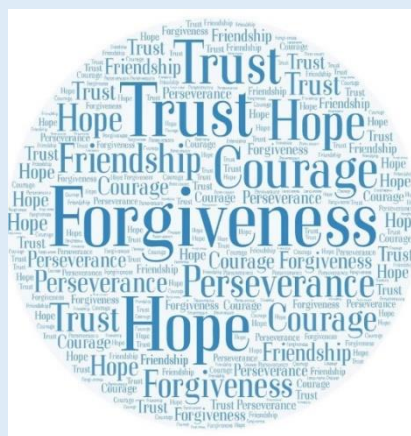
Our school, together with family, church and community, offers a stable rock for learning, resilience and aspiration as we travel through life.

We commit to create a dynamic environment, with Christian values at the heart, where the unique nature of each individual is respected and nurtured to enable life in all its fullness.

*"The rain came down, the streams rose, and the winds blew and beat against that house; yet it did not fall, because it had its foundation on the rock." Matthew 7: 25-27*



At St Helen's Church of England Primary School, our Christian Values can be found in all that we do and are shared and discussed regularly through worship, lessons and around the school. They are the foundation to Jesus' teaching and here at St Helen's we believe that they underpin the creation of well-rounded pupils. The Christian Values derived from a comprehensive stakeholder consultation.



Our curriculum has been designed with our vision and values at the centre. Every decision in school comes back to us living out our Christian Vision and Values.

# Rationale & Intent

Maths learning at St Helen's strives to create a learning environment in which children can confidently learn and achieve, independently and collaboratively, to the best of their ability. Our maths curriculum aims to provide children with the opportunity to develop a curiosity for maths, develop enjoyment and passion for the subject, allowing them to understand the world around them through mathematical reasoning.

Considerable importance is attached to the children achieving and understanding mathematical processes, concepts and skills. A positive attitude to maths learning is encouraged by presenting it in an interesting and enjoyable way, allowing the children to actively participate in the learning process, thus creating a sense of achievement and confidence. There is a strong emphasis on the development of mental arithmetic and giving opportunities for pupils to use and apply mathematics in real life situations.

Using effective planning, teaching and learning strategies, assessment and knowledge of our children, we aim to develop and extend pupils' knowledge and understanding of all mathematical concepts.

Maths is taught through a daily Maths lesson which follows the principles of the National curriculum:

- Become fluent in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time.
- Reason mathematically by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Can solve problems by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between mathematical ideas. The programmes of study are, by necessity, organised into distinct areas, but pupils will make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They will also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content.

Class teachers also plan for opportunities to develop and apply key mathematical skills in other subject areas throughout the year.

# Progression Overview

Throughout school, children are encouraged to learn the basic knowledge that they need at each stage to move forward. These may be addition and subtraction number bonds to and within 10, 20 and 100; counting in 2s, 5s, 10s, 3s and so on; and multiplication and division facts as they are encountered. Children also learn the mathematical vocabulary and facts and rules that they need to proceed in each area as they progress through school.

In Nursery, enhanced indoor provision, adult facilitated learning and engaging outdoor experiences initially match the entry points and needs of all children. Throughout the year, children are engaged in systematic direct teaching of number and number patterns to ensure basic skills are mastered.

In Reception, children build on these basic skills of number, with the focus on what the number actually means and represents. They learn how to make a given number in different ways. This is achieved through areas of provision, adult directed activities and outdoor learning. They establish an understanding of mathematical language and begin to use it in the correct context. Through play, children begin to solve their own problems.

In Year 1, teachers focus on ensuring that children's early number skills are thoroughly embedded and practiced in a range of contexts. Place value is established and ingrained. Broader concepts of measurement – weight, time, mass, volume and length – are introduced. Maths is taught in concrete and practical ways, moving onto pictorial representation of concepts. Correct number formation and ways of representing calculations are taught carefully and consolidated slowly. Children begin to reason about numbers and to explore problems in a variety of ways.

This secure start allows the children in Year 2 to move onto working with larger numbers, using their place value skills to add and subtract across the tens boundary, using concrete and pictorial methods to learn and embed skills before moving on to abstract number. The familiarity with number ensures that multiplication, first as repeated addition and then as groupings, comes easily to children; and leads naturally onto division skills. Areas covered broaden to include a range of measurement skills, including money; shape and statistics, using reasoning and problem-solving and ways to hone their working to make their calculations more efficient and accurate.

By Year 3, children are developing their understanding of number and are able to use a number of methods to work out calculations using all four operations, with larger numbers and more complex problems. They are still using concrete and pictorial methods to grasp the maths that they are working on, moving to the abstract when secure in their understanding. The children are introduced to the concept of perimeter when studying shape and length.

In Year 4, children enjoy larger numbers and the challenge of Roman numerals when working on place value. They work on a number of strategies for working out multiplication and division calculations and challenges. Parts of numbers less than 1 take on a bigger role this year with children working with fractions, including understanding the concept of equivalence, and decimals. Children develop their work on shape, adding area to their repertoire. Statistics develops earlier work on pictograms and bar charts into interpreting line graphs. The multiplication check ensures that children have learned the basic knowledge that they will need to pursue mathematics.

Year 5 continues the theme of working efficiently and effectively. Children become familiar and confident reading and using larger numbers, and learn a number of methods for multiplication and division calculations. The perimeter and area of shapes work extends to shapes that are not rectilinear. The work on fractions and decimals continues with the addition and subtraction of fractions and is extended into work on percentages.

In Year 6, children are able to consolidate their KS2 maths work, having the opportunity to practice the full range of fluency, reasoning and problem-solving skills. Children are encouraged to think about effective and efficient methods and to challenge their thinking. Areas such as algebra and ratio are new subjects that are introduced; these rely on children having acquired a depth of understanding and sound skills as they work through school.

# Nursery Learning Journey

<b>Comparison 1</b>	<b>Shape, Space and Measure 1</b>	<b>Pattern 1</b>	<b>Counting 1</b>	<b>Counting 2</b>	<b>Subitising 1</b>
More than, fewer than, same	Explore and build with shapes and objects	Explore repeats	Hear and say number names	Begin to order number names	I see 1, 2, 3
<b>Pattern 2</b>	<b>Shape, Space and Measure 2</b>	<b>Subitising 2</b>	<b>Counting 3</b>	<b>Shape, Space and Measure 3</b>	<b>Pattern 3</b>
Join in with repeats	Explore position and space	Show me 1, 2, 3	Move and label 1, 2, 3	Explore position and routes	Explore own first patterns
<b>Counting 4</b>	<b>Shape, Space and Measure 4</b>	<b>Subitising 3</b>	<b>Comparison 2</b>	<b>Pattern 4</b>	<b>Shape, Space and Measure 5</b>
Take and give 1, 2, 3	Match, talk, push and pull	Talk about dots	Compare and sort collections	Lead on own repeats	Start to puzzle
<b>Pattern 5</b>	<b>Subitising 4</b>	<b>Counting 5</b>	<b>Pattern 6</b>	<b>Counting 6</b>	<b>Comparison 3</b>
Making patterns together	Match games and actions	Show me 5	My own pattern	Stop at 1, 2, 3, 4, 5	Match, sort, compare

# Reception Learning Journey

<b>Autumn Term</b>	<b>Getting to Know You</b>	<b>Match, Sort &amp; Compare</b>	<b>Talk about Measures &amp; Patterns</b>	<b>It's Me 1, 2, 3</b>	<b>Circle &amp; Triangles</b>	<b>1, 2, 3, 4, 5</b>	<b>Shapes with 4 sides</b>
<b>Spring Term</b>	<b>Alive in 5</b>	<b>Mass &amp; Capacity</b>	<b>Growing 6, 7, 8</b>	<b>Length, Height &amp; Time</b>	<b>Building 9 &amp; 10</b>	<b>Explore 3D Shapes</b>	
<b>Summer Term</b>	<b>To 20 and Beyond</b>	<b>How Many Now?</b>	<b>Manipulate, Compose &amp; Decompose</b>	<b>Sharing &amp; Grouping</b>	<b>Visualise, Build &amp; Map</b>	<b>Make Connections</b>	<b>Consolidation</b>

# Year 1 Learning Journey

<b>Autumn Term</b>	<b>Place Value (within 10)</b>		<b>Addition &amp; Subtraction (within 10)</b>			<b>Geometry</b>	<b>Consolidation</b>
<b>Spring Term</b>	<b>Place Value (within 20)</b>	<b>Addition &amp; Subtraction (within 20)</b>		<b>Place Value (within 50)</b>	<b>Length &amp; Height</b>	<b>Mass &amp; Volume</b>	
<b>Summer Term</b>	<b>Multiplication &amp; Division</b>	<b>Fractions</b>	<b>Position &amp; Direction</b>	<b>Place Value (within 100)</b>	<b>Money</b>	<b>Time</b>	<b>Consolidation</b>

# Year 2 Learning Journey

<b>Autumn Term</b>	<b>Place Value</b>	<b>Addition &amp; Subtraction</b>			<b>Shape</b>
<b>Spring Term</b>	<b>Money</b>	<b>Multiplication &amp; Division</b>		<b>Length &amp; Height</b>	<b>Mass, Capacity &amp; Temperature</b>
<b>Summer Term</b>	<b>Fractions</b>	<b>Time</b>	<b>Statistics</b>	<b>Position &amp; Direction</b>	<b>Consolidation</b>

# Year 3 Learning Journey

<b>Autumn Term</b>	<b>Place Value</b>	<b>Addition &amp; Subtraction</b>		<b>Multiplication &amp; Division A</b>		
<b>Spring Term</b>	<b>Multiplication &amp; Division B</b>	<b>Length &amp; Perimeter</b>	<b>Fractions A</b>		<b>Mass &amp; Capacity</b>	
<b>Summer Term</b>	<b>Fractions B</b>	<b>Money</b>	<b>Time</b>	<b>Shape</b>	<b>Statistics</b>	<b>Consolidation</b>

# Year 4 Learning Journey

<b>Autumn Term</b>	<b>Place Value</b>		<b>Addition &amp; Subtraction</b>		<b>Area</b>	<b>Multiplication &amp; Division A</b>		<b>Consolidation</b>
<b>Spring Term</b>	<b>Multiplication &amp; Division B</b>		<b>Length &amp; Perimeter</b>	<b>Fractions</b>			<b>Decimals A</b>	
<b>Summer Term</b>	<b>Decimals B</b>	<b>Money</b>	<b>Time</b>	<b>Consolidation</b>	<b>Shape</b>	<b>Statistics</b>	<b>Position &amp; Direction</b>	

# Year 5 Learning Journey

<b>Autumn Term</b>	<b>Place Value</b>	<b>Addition &amp; Subtraction</b>	<b>Multiplication &amp; Division A</b>	<b>Fractions A</b>		
<b>Spring Term</b>	<b>Multiplication &amp; Division B</b>	<b>Fractions B</b>	<b>Decimals &amp; Percentages</b>	<b>Perimeter &amp; Area</b>	<b>Statistics</b>	
<b>Summer Term</b>	<b>Shape</b>	<b>Position &amp; Direction</b>	<b>Decimals</b>	<b>Negative Numbers</b>	<b>Converting Units</b>	<b>Volume</b>

# Year 6 Learning Journey

<b>Autumn Term</b>	<b>Place Value</b>	<b>Addition, Subtraction, Multiplication &amp; Division</b>		<b>Fractions A</b>	<b>Fractions B</b>	<b>Converting Units</b>
<b>Spring Term</b>	<b>Ratio</b>	<b>Algebra</b>	<b>Decimals</b>	<b>Fractions, Decimals &amp; Percentages</b>	<b>Area, Perimeter &amp; Volume</b>	<b>Statistics</b>
<b>Summer Term</b>	<b>Shape</b>	<b>Position &amp; Direction</b>	<b>Themes projects, Consolidation &amp; Problem Solving</b>			

# Place Value Progression

COUNTING							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
count in rote to 10 count in  correspondence to 7 subitise to 3  show 5 using one hand and 10 using two hands	verbally count beyond 20  1:1 correspondence to 10	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
	Represent and compose numbers to 10  Build and identify numbers to 20	count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
Identify more/less	Identify one more and one less within 10	given a number, identify one more and one less		find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
COMPARING NUMBERS							
Use 'my turn, your turn' to show equal amounts	Order quantities and numbers to 10	use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use <, > and = signs	compare and order numbers up to 1000	order and compare numbers beyond 1000  <i>compare numbers with the same number of decimal places up to two decimal places</i> (copied from Fractions)	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS							
	Identify and represent numbers to 10	identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line	identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		

**READING AND WRITING NUMBERS (including Roman Numerals)**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	read and write numbers to 10	read and write numbers from 1 to 20 in numerals and words.	read and write numbers to at least 100 in numerals and in words	read and write numbers up to 1000 in numerals and in words  <i>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement)</i>	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers)  read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)

**UNDERSTANDING PLACE VALUE**

			recognise the place value of each digit in a two-digit number (tens, ones)	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)  <i>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 units, tenths and hundredths (copied from Fractions)</i>	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)  <i>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)</i>	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)  <i>identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places (copied from Fractions)</i>
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ROUNDING							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					round any number to the nearest 10, 100 or 1000	round any number up to 1000000 to the nearest 10, 100, 1000, 10 000 and 100 000	round any whole number to a required degree of accuracy
					<i>round decimals with one decimal place to the nearest whole number</i> (copied from Fractions)	<i>round decimals with two decimal places to the nearest whole number and to one decimal place</i> (copied from Fractions)	<i>solve problems which require answers to be rounded to specified degrees of accuracy</i> (copied from Fractions)
PROBLEM SOLVING							
			use place value and number facts to solve problems	solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above

# Addition & Subtraction Progression

NUMBER BONDS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	know number bonds to 10	represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
MENTAL CALCULATION							
subitise to 3	subitise to 10	add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> <li>* a two-digit number and ones</li> <li>* a two-digit number and tens</li> <li>* two two-digit numbers</li> <li>* adding three one-digit numbers</li> </ul>	add and subtract numbers mentally, including: <ul style="list-style-type: none"> <li>* a three-digit number and ones</li> <li>* a three-digit number and tens</li> <li>* a three-digit number and hundreds</li> </ul>		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
		read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				use their knowledge of the order of operations to carry out calculations involving the four operations

WRITTEN METHODS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		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)	
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS							
			recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
PROBLEM SOLVING							
		solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> <li>* using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>* applying their increasing knowledge of mental and written methods</li> </ul> <p><i>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)</i></p>	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p> <p>Solve problems involving addition, subtraction, multiplication and division</p>

# Multiplication & Division Progression

MULTIPLICATION & DIVISION FACTS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
share into equal groups	make pairs  begin to double numbers	<i>count in multiples of twos, fives and tens</i> (copied from Number and Place Value)	<i>count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward</i> (copied from Number and Place Value)	<i>count from 0 in multiples of 4, 8, 50 and 100</i> (copied from Number and Place Value)	<i>count in multiples of 6, 7, 9, 25 and 1000</i> (copied from Number and Place Value)	<i>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</i> (copied from Number and Place Value)	
	identify odd and even numbers to 10		recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	recall multiplication and division facts for multiplication tables up to $12 \times 12$		
MENTAL CALCULATION							
				write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)	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	multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
			show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. <math>\frac{3}{8}</math>)</i> (copied from Fractions)

**WRITTEN CALCULATION**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signs	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	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 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 one-digit number using the formal written method of short division and interpret remainders appropriately for the context	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context 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
							<i>use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))</i>

**PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					recognise and use factor pairs and commutativity in mental calculations (repeated)	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 establish whether a number up to 100 is prime and recall prime numbers up to 19	identify common factors, common multiples and prime numbers  <i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</i> (copied from Fractions)
						recognise and use square numbers and cube numbers, and the notation for squared ( $^2$ ) and cubed ( $^3$ )	<i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (<math>cm^3</math>) and cubic metres (<math>m^3</math>), and extending to other units such as <math>mm^3</math> and <math>km^3</math></i> (copied from Measures)

ORDER OF OPERATIONS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS							
				<i>estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)</i>	<i>estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)</i>		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
PROBLEM SOLVING							
		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	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	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	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
						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	<i>solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)</i>

# Fractions, Decimals & Percentages Progression

COUNTING IN FRACTIONAL STEPS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<i>Pupils should count in fractions up to 10, starting from any number and using the 1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)</i>	count up and down in tenths	count up and down in hundredths		
RECOGNISING FRACTIONS							
share objects into two equal groups	share objects into equal groups  understand the language 'whole' and 'parts'	recognise, find and name a half as one of two equal parts of an object, shape or quantity	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	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
				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 name a quarter as one of four equal parts of an object, shape or quantity		recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
COMPARING FRACTIONS							
				compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

COMPARING DECIMALS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
ROUNDING INCLUDING DECIMALS							
					round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)							
			write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ .	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
					recognise and write decimal equivalents of any number of tenths or hundredths	read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$ ) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$ )
					recognise and write decimal equivalents to $\frac{1}{4}$ ; $\frac{1}{2}$ ; $\frac{3}{4}$	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 as a decimal fraction	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

**ADDITION AND SUBTRACTION OF FRACTIONS**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ )	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number  recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements $> 1$ as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ )	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

**MULTIPLICATION AND DIVISION OF FRACTIONS**

						multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ )  multiply one-digit numbers with up to two decimal places by whole numbers
							divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$ )

**MULTIPLICATION AND DIVISION OF DECIMALS**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							multiply one-digit numbers with up to two decimal places by whole numbers
					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		multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
							identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
							associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$ )
							use written division methods in cases where the answer has up to two decimal places

**PROBLEM SOLVING**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				solve problems that involve all of the above	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	solve problems involving numbers up to three decimal places	
					solve simple measure and money problems involving fractions and decimals to two decimal places.	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 with a denominator of a multiple of 10 or 25.	

# Ratio & Proportion Progression

Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							solve problems involving the relative sizes of two 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 where the scale factor is known or can be found
							solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

# Algebra Progression

EQUATIONS							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		<p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and <b>missing number problems</b> such as <math>7 = \square - 9</math> (copied from Addition and Subtraction)</p>	<p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and <b>missing number problems</b>. (copied from Addition and Subtraction)</p>	<p>solve problems, including <b>missing number</b> problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction)</p>		<p>use the properties of rectangles to deduce related facts and find <b>missing lengths and angles</b> (copied from Geometry: Properties of Shapes)</p>	<p>express missing number problems algebraically</p>
			<p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)</p>	<p>solve problems, including <b>missing number</b> problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division)</p>			<p>find pairs of numbers that satisfy number sentences involving two unknowns</p>
		<p>represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)</p>					<p>enumerate all possibilities of combinations of two variables</p>

FORMULAE							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Perimeter can be expressed algebraically as $2(a + b)$ where $a$ and $b$ are the dimensions in the same unit. (Copied from NSG measurement)		use simple formulae  recognise when it is possible to use <b>formulae</b> for area and volume of shapes (copied from Measurement)
SEQUENCES							
sequence events from a story using first and then	sequence events using first, then, after	<i>sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening</i> (copied from Measurement)	<i>compare and sequence intervals of time</i> (copied from Measurement)  <i>order and arrange combinations of mathematical objects in patterns</i> (copied from Geometry: position and direction)				generate and describe linear number sequences

# Measurement Progression

COMPARING AND ESTIMATING							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>sort objects by colour and size</p> <p>begin to use the words big, small, tall, heavy, light, full, empty, long and short to describe objects</p> <p>match objects that are the same</p>	<p>compare and sort amounts and objects</p> <p>compare amounts in mass and capacity</p> <p>confidently use the words big, small, tall, heavy, light, full, empty, long and short to describe objects</p>	<p>compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> <li>* lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half]</li> <li>* mass/weight [e.g. heavy/light, heavier than, lighter than]</li> <li>* capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter]</li> <li>* time [e.g. quicker, slower, earlier, later]</li> </ul>	<p>compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =</p>		<p>estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)</p>	<p>calculate and compare the area of squares and rectangles including using standard units, square centimetres (<math>\text{cm}^2</math>) and square metres (<math>\text{m}^2</math>) and estimate the area of irregular shapes (also included in measuring)</p> <p>estimate volume (e.g. using <math>1\text{ cm}^3</math> blocks to build cubes and cuboids) and capacity (e.g. using water)</p>	<p>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (<math>\text{cm}^3</math>) and cubic metres (<math>\text{m}^3</math>), and extending to other units such as <math>\text{mm}^3</math> and <math>\text{km}^3</math>.</p>
<p>sequence events from a story that is familiar to them</p>	<p>sequence events using first, then, after</p>	<p>sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p>	<p>compare and sequence intervals of time</p>	<p>compare durations of events, for example to calculate the time taken by particular events or tasks</p>			
				<p>estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)</p>			

**MEASURING and CALCULATING**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>compare amounts in mass and capacity</p> <p>explore the concept of height</p>	<p>measure and begin to record the following:</p> <ul style="list-style-type: none"> <li>* <b>lengths and heights</b></li> <li>* <b>mass/weight</b></li> <li>* <b>capacity and volume</b></li> <li>* <b>time</b> (hours, minutes, seconds)</li> </ul>	<p>choose and use appropriate standard units to estimate and measure <b>length/height</b> in any direction (m/cm); <b>mass</b> (kg/g); <b>temperature</b> (°C); <b>capacity</b> (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels</p>	<p>measure, compare, add and subtract: <b>lengths</b> (m/cm/mm); <b>mass</b> (kg/g); <b>volume/capacity</b> (l/ml)</p>	<p>estimate, compare and calculate <b>different measures</b>, including <b>money in pounds and pence</b> (appears also in Comparing)</p>	<p>use all four operations to solve problems involving measure (e.g. <b>length, mass, volume, money</b>) using decimal notation including scaling.</p>	<p>solve problems involving the calculation and conversion of <b>units of measure</b>, using decimal notation up to three decimal places where appropriate (appears also in Converting)</p>
				<p>measure the <b>perimeter</b> of simple 2-D shapes</p>	<p>measure and calculate the <b>perimeter</b> of a rectilinear figure (including squares) in centimetres and metres</p>	<p>measure and calculate the <b>perimeter</b> of composite rectilinear shapes in centimetres and metres</p>	<p>recognise that shapes with the same areas can have different <b>perimeters</b> and vice versa</p>

**MEASURING and CALCULATING**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		recognise and know the value of different denominations of <b>coins and notes</b>	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	add and subtract amounts of <b>money</b> to give change, using both £ and p in practical contexts			
					find the area of rectilinear shapes by counting squares	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm <sup>2</sup> ) and square metres (m <sup>2</sup> ) and estimate the area of irregular shapes  <i>recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</i> (copied from Multiplication and Division)	calculate the area of parallelograms and triangles  calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm <sup>3</sup> ) and cubic metres (m <sup>3</sup> ), and extending to other units [e.g. mm <sup>3</sup> and km <sup>3</sup> ].  recognise when it is possible to use formulae for area and volume of shapes

**TELLING THE TIME**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	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.	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)		
	explore the concept of time	recognise and use language relating to dates, including days of the week, weeks, months and years	know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)			
					solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	

**CONVERTING**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)	know the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	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 three decimal places
					read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
					solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres

# Shapes Progression

IDENTIFYING SHAPES AND THEIR PROPERTIES							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
identify a square, circle and a triangle	identify and describe a circle, triangle, square and rectangle  identify a cube, sphere, cylinder and cone	recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line		identify lines of symmetry in 2-D shapes presented in different orientations	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)
			identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces				illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
			identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]				
DRAWING AND CONSTRUCTING							
				draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	complete a simple symmetric figure with respect to a specific line of symmetry	draw given angles, and measure them in degrees ( $^{\circ}$ )	draw 2-D shapes using given dimensions and angles
							recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)

**COMPARING AND CLASSIFYING**

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
sort objects by colour and size	sort objects in a variety of different ways		compare and sort common 2-D and 3-D shapes and everyday objects		compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
						distinguish between regular and irregular polygons based on reasoning about equal sides and angles	

**ANGLES**

				recognise angles as a property of shape or a description of a turn		know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
				identify right angles, recognise that two right 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	identify acute and obtuse angles and compare and order angles up to two right angles by size	identify: * angles at a point and one whole turn (total $360^\circ$ ) * angles at a point on a straight line and $\frac{1}{2}$ a turn (total $180^\circ$ ) * other multiples of $90^\circ$	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
				identify horizontal and vertical lines and pairs of perpendicular and parallel lines			

# Position, Direction & Movement Progression

POSITION, DIRECTION AND MOVEMENT							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>use positional language – on top, under, next to, behind</p> <p>discuss routes and locations using appropriate language</p>	<p>confidently use positional language – under, over, around, through</p>	<p>describe position, direction and movement, including half, quarter and three-quarter turns.</p>	<p>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)</p>		<p>describe positions on a 2-D grid as coordinates in the first quadrant</p>	<p>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>	<p>describe positions on the full coordinate grid (all four quadrants)</p>
					<p>describe movements between positions as translations of a given unit to the left/right and up/down</p>		<p>draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>
					<p>plot specified points and draw sides to complete a given polygon</p>		
PATTERN							
<p>identify patterns around them</p> <p>make an ABAB repeating pattern</p> <p>notice and correct an error in a repeating pattern</p>	<p>make an AAB/ABB repeating pattern</p>		<p>order and arrange combinations of mathematical objects in patterns and sequences</p>				

# Interpreting Data Progression

## INTERPRETING, CONSTRUCTING AND PRESENTING DATA

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			interpret and construct simple pictograms, tally charts, block diagrams and simple tables	interpret and present data using bar charts, pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems
			ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity				
			ask and answer questions about totalling and comparing categorical data				

## SOLVING PROBLEMS

				solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average
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