Mathematics Progression Map

Our progression map details how the objectives progress from Year 1, where children start their KS1 Mathematical Journey up to Lower Key Stage 2. The Maths curriculum is comprised of:

- Statutory Objectives from the National Curriculum that need to be taught in each Year group. These are in black on the document.
- Non-Statutory Objectives from the National Curriculum 2014 – notes and guidance. These are shown in blue throughout the document.

In addition to the National Curriculum objectives – I have added in some statements in red to aid progression from one year group to the next. These DO NOT have to be taught but are there to be considered when planning.

Out of these numerous objectives, there are certain aspects that are vital to each Year Group. These are known as KPI (Key Performance Indicators) statements. These are shaded in within the document. ***These match our assessment tool 'Target Tracker'.***

Due to lockdown, children have also missed part of their learning in schools. In order to ensure children are 'Ready-to-Progress' into the next year group, they need to have a good understanding of certain objectives. These are noted at the end of each section.

Progression is shown from EYFS all the way through to Year 6 in order to show how our curriculum within Finstall First School supports transition into Upper Key Stage 2 when the children move to their Middle School.

This is a working document and is subject to changes as and when new guidance come out.

Miss Morton

Mathematics Lead

Number and Place Value						
Counting						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Three and Four-Year Olds **Reception** **Early Learning Goals** Recite numbers past 5. Say one number for each item in order: 1, 2, 3, 4, 5 Know that the last number reached when counting a small set of objects tells you how many there are in total (cardinal principle) Count objects, actions and sounds. Count beyond 10. Verbally count beyond 20, recognising the pattern of the counting system.	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.		Begin to understand negative numbers and count back through zero.	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.
	Count in multiples of twos, fives and tens from different multiples. *(Also in Multiplication and Division)*	Count in steps of 2, 3 and 5 from 0, and in tens from any number forward and backward.	Count from 0 in multiples of 4, 8, 50 and 100. Use multiples of 2, 3, 5 and 10 also.	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.	
	Given a number, identify one more and one less.	Begin to find 10 more or less than a given number.	Find 10 or 100 more or less than a given number.	Find 1000 more or less than a given number.	Find 0.1 more or less than a 1 point decimal number.	Find 0.01 more or less than a 1 or 2 point decimal number.
	Use ordinal numbers.					
	Indicate a quantity.					
	Recognise patterns in the number system. E.g. odd and even.					

Reading and Writing Numbers						
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. Link the number symbol (numeral) with its cardinal number value.	Read and write numbers from 1 to 20 in numerals and words. Count and read numbers to 100 in numerals. Read and write numbers beyond 20 in numerals and words.	Read and write numbers to at least 100 in numerals and words.	Read and write numbers up to 1000 in numerals and in words. To start to read and write numbers with one decimal place in numerals.	Read and write numbers to at least 10, 000 in numerals and words. To start to read and write numbers with up to two decimal places.	Read and write numbers to at least 1, 000 000. Read and write numbers with up to three decimal places.	Read and write numbers up to 10, 000, 000. Read and write numbers with up to three decimal places.
Roman Numerals						
			Read and write Roman Numerals from I to XX. Read time on a clock face in Roman Numerals I to XII (Taken from Measurement)	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 Roman numerals to 1000 (M) and recognise years written in Roman numerals.	

Understanding Place Value						
Experiment with their own symbols and marks as well as numerals. Subitise. Link the number symbol (numeral) with its cardinal number value. Understand the 'one more than/one less than' relationship between consecutive numbers. Explore the composition of numbers to 10. Subitise (recognise quantities without counting) up to 5. Have a deep understanding of numbers to 10, including the composition of each number.	Recognise the place value of each digit in a number up to at least 20.	Recognise the place value of each digit in a two-digit number (tens and ones) and partition in different ways. E.g. 23 = 20 + 3 23 = 10 + 13 Understand 0 as a place holder.	Recognise the place value of each digit in a three-digit number (hundreds, tens and ones) and partition in different ways.	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) and partition in different ways. Partition decimals with up to two decimal places and partition in different ways.	Determine the value of each digit in numbers to at least 1 000 000 and to two decimal places and partition in different ways.	Determine the value of each digit in numbers up to 10 000 000 and to 3 decimal places and partition in different ways.
	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, including using the number line.	Identify, represent and estimate numbers using different representations, including using the number line.	Identify, represent and estimate numbers using different representations, including using the number line.	Identify, represent and estimate numbers using different representations, including using the number line.

Comparing and Ordering Number						
Compare quantities using language: 'more than', 'fewer than'. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then'. Compare numbers. Understand the 'one more than/one less than' relationship between consecutive numbers. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	Use the language of: equal to, more than, less than (fewer), most and least. Compare numbers up to 100 supported by objects and pictorial representations.	Compare and order numbers from 0 up to 100 (at least). Use < > and = signs.	Compare and order numbers up to 1000. Use < > and = to compare two calculations using the four operations.	Order and compare numbers beyond 1000. Use < > = to compare two calculations using the four operations.	Order and compare numbers to at least 1 000 000 and determine the value of each digit. Use < > = to compare two calculations using the four operations.	Order and compare numbers up to 10 000 000 and determine the value of each digit. Use < > = to compare two calculations using the four operations.
		Compare and order $^1/_3$, ¼ and ½ *(Taken from Fractions)*	Compare and order unit fractions, and fractions with the same denominators. *(Taken from Fractions)*	Continue to compare and order unit fractions and non-unit fractions with the same denominators. *(Taken from Fractions)*	Compare and order fractions whose denominators are all multiples of the same number. *(Taken from Fractions)*	Compare and order fractions, including fractions >1. *(Taken from Fractions)*
			Use knowledge of tenths to help compare and order numbers with one decimal place. Identify the value of each digit and represent on a number line. *(Taken from Decimals)*	Order and compare numbers with the same number of decimal places and up to two decimal places. Identify the value of each digit in a decimal number. Represent decimals on a number line. *(Taken from Decimals)*	Read, write, order and compare numbers with up to three decimal places. Understand the value of each digit within a decimal number with three decimal places. *(Taken from Decimals)*	

Rounding						
	Identify which numbers are closest to a number such as 20.	Round numbers to at least 100 to the nearest 10.	Round numbers to at least 1000 to the nearest 10 or 100.	Round any number to the nearest 10, 100 or 1000.	Round any number up to 1 000 000 to the nearest 10, 100, 1000 and 10,000 and 100 000.	Round any whole number to a required degree of accuracy.
				Round decimals with one decimal place to the nearest whole number. *(Taken from Decimals)*	Round decimals with two decimal places to the nearest whole number and to one decimal place.	Round decimals with three decimal places to the nearest whole number or one or two decimal places.
Multiplying and Dividing by 10, 100 and 1000						
		Find the effect of multiplying a one or two-digit number by 10 – using practical equipment to support. Identify the value of the digits. *(Taken from Multiplication and Division)*	Find the effect of multiplying a one or two-digit number by 10 and 100. Identify the value of the digits. *(Taken from Multiplication and Division)*	Find the effect of multiplying and dividing a one or two-digit number by 10 and 100. Identify the value of the digits in the answer as ones, tenths and hundredths. *(Taken from Multiplication and Division)*	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. *(Taken from Multiplication and Division)*	Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places. *(Taken from Multiplication and Division)*

Problem Solving						
Solve real world mathematical problems with numbers up to 5.

Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then'. | Use place value and number facts to solve problems. | Use place value and number facts to solve problems. | Solve number problems and practical problems involving these ideas above. | 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 below. | Solve number and practical problems that involve all of the above. |
| Ready-To-Progress Criteria | | | | | | |
| | **1NPV-1** Count within 100, forwards and backwards, starting with any number. | | **3NPV-1**Know that 10 tens are equivalent to one hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10. | **4NPV-1** Know that 10 hundreds are equivalent to one thousand, and that 1000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100. | **5NPV-1** Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01. | **6NPV-1** Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1000) |

		2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.	**3NPV-2** Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.	**4NPV-2** Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.	**5NPV-2** Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.	**6NPV-2** Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.
	1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =.	**2NPV-2** Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.	**3NPV-3** Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.	**4NPV-3** Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1000 and 100 and rounding to the nearest of each.	**5NPV-3** Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	**6NPV-3** Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round number system, and round numbers, as appropriate, including in contexts.
			3NPV-4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.	**4NPV-4** Divide 1000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1000 with 2, 4, 5 and 10 equal parts.	**5NPV-4** Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.	**6NPV-4** Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
					5NPV-5 Convert between units of measure, including using common decimals and fractions.	

	1NF-1 Develop fluency in addition and subtraction facts within 10.	**2NF-1** Secure fluency in addition and subtraction facts within 10, through continued practice.	**3NF-1** Secure fluency, in addition and subtraction facts that bridge 10, through continued practice.			
	1NF-2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.		**3NF-2** Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	**4NF-1** Recall multiplication and division facts up to 12 x 12, and recognise products in multiplication tables as multiples of the corresponding number.	**5NF-1** Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	
				4NF-2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.		
			3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10)	**4NF-3** Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)	**5NF-2** Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).	

Number: Addition and Subtraction

Understanding Addition and Subtraction

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Three and Four-Year Olds **Reception** **Early Learning Goals**	Read, write and interpret mathematical statements involving addition, subtraction and equals signs. Realise the effect of adding or subtracting 0.	Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. Check calculations, including by adding to check subtraction and adding numbers in a different order to check addition				Use knowledge of the order of operations to carry out calculations involving the four operations. Explore the order of operations using brackets.

Number Bonds						
Develop fact recognition of up to 3 objects, without having to count them individually (subitising). Show 'finger numbers' up to 5. Subitise. Explore the composition of numbers to 10. Automatically recall number bonds 0 – 5 and some to 10. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. Have a deep understanding of numbers to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5.	Represent and use number bonds and related subtraction facts with 20. In several forms. E.g.	Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100. E.g. Use: 3 + 7 = 10 10 – 7 = 3 7 = 10 – 3 To calculate: 30 + 70 = 100 100 – 70 = 30 70 = 100 – 30 Recall and use addition and subtraction facts to 100 – multiples of 10. Recall and use addition and subtraction facts with numbers up to 50. E.g. different ways to make 25, 26, 27, 31 etc.	Recall and use addition and subtraction facts to 100 – multiples of 10. Recall and use addition and subtraction facts to 100 – multiples of 5. Recall and use addition and subtraction facts with numbers up to at least 50. E.g. different ways to make 25, 26, 27, 31 etc.	Recall and use addition and subtraction facts with numbers to 100. E.g. 83 + 17 = 100 17 + 83 = 100 100 – 83 = 17 100 – 17 = 83 Recall and use addition and subtraction facts to 1000 – multiples of 100 and extend to 50. Derive and use addition and subtractions facts for 1 with decimals to 1 decimal place.	Continue to use addition and subtraction facts to 100 and 1000 to improve speed and fluency with mental calculations. Recall and use addition and subtraction facts for 1 to 10 with decimal numbers up to one decimal place.	Continue to use addition and subtraction facts to 100 and 1000 to improve speed and fluency with mental calculations. Recall and use addition and subtraction facts for 1 to 10 with decimal numbers up to two decimal places.

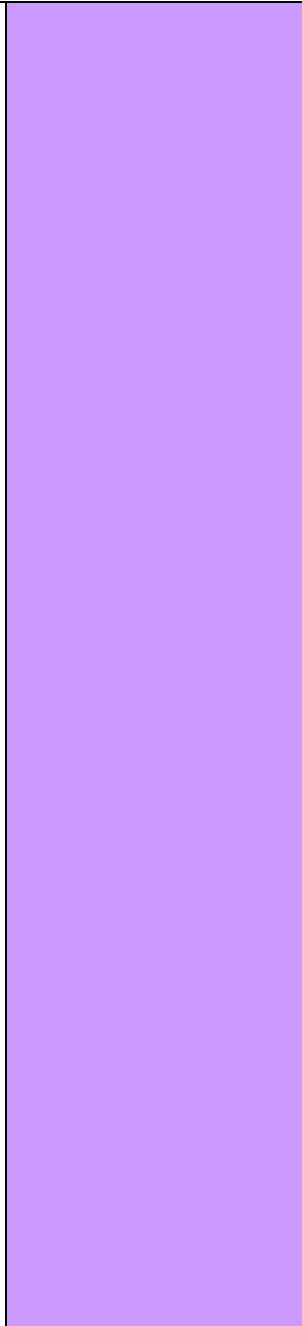| Mental Calculation						
Develop fast recognition of up to 3 objects, without having to count them individually (subitising). Know that the last number reached when counting a small set of objects tells you how many there are in total (cardinal principle). Show 'finger numbers' up to 5. Subitise. Explore the composition of numbers to 10. Automatically recall number bonds 0 – 5 and some to 10. Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number	Add and subtract one-digit and two-digit numbers to 20 including 0. Using: • Concrete materials Pictorial representations	Add and subtract numbers using concrete objects, pictorial representations, and mentally, 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 mentally, including: • A three-digit number and ones. • A three-digit number and tens. • A three-digit number and ones.		Add and subtract numbers mentally with increasingly large numbers.	Perform mental calculations, including with mixed operations and large numbers.

bonds to 10, including double facts. Have a deep understanding of numbers to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5.					

	Written Methods					
	• Read, write and interpret mathematical statements involving addition, subtraction and equals signs. *(Also appears in Mental Calculations)*		Add and subtract two numbers with up to three digits, using formal written methods of columnar addition and subtraction.	Add and subtract two numbers with up to four digits using the formal written methods of columnar addition and subtraction, where appropriate. Add and subtract decimals with up to two decimal places using the formal written methods of columnar addition and subtraction.	Add and subtract whole numbers with more than four digits using formal written methods. Add and subtract decimals with up to two decimal places using formal written methods of columnar addition and subtraction.	Continue to add and subtract numbers with more than four digits and decimals with up to three decimal places using formal written methods.
		Add and subtract ½ and ¼ from a given number to 10. *(Taken from Fractions)*	Add and subtract fractions with the same denominator within one whole. *(Taken from Fractions)*	Add and subtract fractions with the same denominator. Beyond a whole. *(Taken from Fractions)*	Add and subtract fractions with the same denominator and denominators that are multiples of the same number. *(Taken from Fractions)*	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. *(Taken from Fractions)*
					Write mathematical statements >1 as a mixed number. $^2/_5 + {}^4/_5 = {}^6/_5 = 1\,{}^1/_5$ *(Taken from Fractions)*	

| | | | | Add and subtract decimals with up to two decimal places using the formal written methods of columnar addition and subtraction.

(Taken from Decimals) | Add and subtract decimals with two decimal places using formal written methods.

Add and subtract decimals, including:
- A mix of whole numbers and decimals.
- Decimals with different numbers of decimal places.
- Complements of 1 (E.g. 0.83 + 0.17)

(Taken from Decimals) | Continue to develop the skills learnt previously and extend to working with decimals up to three places.

(Taken from Decimals) |
|---|---|---|---|---|---|---|

Estimating and Checking						
Develop fast recognition of up to 3 objects, without having to count them individually (subitising). Explore the composition of numbers to 10.	Begin to understand the relationship between addition and subtraction and use of the word inverse.	Recognise and use the inverse relationship between addition and subtraction and use this to check calculations.	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, an appropriate degree of accuracy.

Problem Solving						
Solve real world mathematical problems with numbers up to 5. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then…' Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.	Solve one-step problems that involve: • Addition and subtraction. • Concrete objects. Pictorial representations.	Solve problems with addition and subtraction using: • Concrete objects. • Pictorial representations. • Numbers. • Quantities. • Measures. • Mental and written methods. • Missing numbers using inverse.	Solve problems, including: • Missing number problems. • Using number facts. • Place value. • More complex addition and subtraction. • Which of the four operations to use and why. *(Taken from Multiplication and Division)*	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.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

		Solve problems with addition and subtraction applying his/her increasing knowledge of written methods where regrouping may be required.			Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign and using missing numbers. *(Taken from Multiplication and Division)*	Solve problems involving addition, subtraction, multiplication and division.

Ready-To-Progress Criteria

	1AS1-1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	**2AS-1** Add and subtract across 10.	**3AS-1** Calculate complements to 100.			**6AS/MD-1** Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).

		1AS-2 Read, write and interpret equations containing addition, subtraction and equals symbols, and relate additive and expressions and equations to real-life contexts.	2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more…?".	2AS-2 Add and subtract up to three-digit numbers using columnar methods.			6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
			2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.	3AS-3 Manipulate the additive relationship: understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.			6AS/MD-3 Solve problems involving ratio relationships.
			2AS-4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.				6AS/MD-4 Solve problems with 2 unknowns.

Number: Multiplication and Division						
Understanding Multiplication and Division						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Three and Four-Year Olds

Reception

Early Learning Goals | Develop understanding of multiplication and division through practical activities. | Understand multiplication as arrays and repeated addition. | Understand the relationship between multiplication and division (inverse).

Use multiplication triangles to develop family of facts. | Use multiplication triangles to develop families of facts. | | Use their knowledge of the order of operations to carry out calculations involving the four operations. |
| | | Show that multiplication can be done in any order (commutative) and division of one number by another cannot. | | | | |
| | | Use commutativity and inverse relations to develop multiplicative reasoning.

Relate division to fractions and measures. | Use commutativity and associativity. E.g. 4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 | Write statements about the equality of expressions. E.g. use the distributive law. 39 x 7 = 30 x 7 + 9 x 7 and associative law (2x3) x 4 = 2 x (3x4) | Distributivity can be expressed as a(b + c) = ab + ac

Construct equivalence statements.

E.g. 4 x 35 = 2 x 2 x 35 | Explore the order of operations using brackets.

E.g. 2 + 1 x 3 = 5 (2 + 1) x 3 = 9 |

Multiplication and Division Facts						
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.	Count in multiples of 2, 5 and 10 from different multiples. (From Number and Place Value)	Recall and use multiplication and division facts for 2, 5 and 10 multiplication tables and connect them to each other, recognising odd and even numbers.	Recall and use multiplication and division for the 3, 4 and 8 times tables.	Recall multiplication and division facts for times tables up to 12 x 12.		
Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.		Connect the 10 multiplication table to place value and the 5 times table to the divisions on a clock face.	Use multiplication and division facts to derive related facts.	Use place value, known and derived facts to multiply and divide mentally including: • Multiplication by 0 and 1 • Dividing by 1 • Multiplying together 3 numbers.		

Doubling and Halving						
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.	Recall and use doubles of numbers to 20 and their corresponding halves.	Recall and use doubles of all numbers to 50. Recall and use halves of 2-digit even numbers to 50. Double multiples of 10 to 100 and find the corresponding halves. Double multiples of 5 to 50 and find the corresponding halves.	Recall and use doubles of all multiples to 100 and corresponding halves. Double multiples of 10 and 100 to 1000. Develop doubling strategies linked to times tables.	Double and halve any 3-digit number by partitioning. Double any decimal to 1 decimal place. Develop doubling and halving strategies linked to times tables.	Double and halve any decimal to 1 decimal place. Develop doubling and halving strategies linked to times tables.	Double and halve any number including decimals.
Multiplying and Dividing by 10, 100 and 1000						
		Find the effect of multiplying a one or two-digit number by 10 – using practical equipment to support. Identify the value of the digits.	Find the effect of multiplying a one or two-digit number by 10 and 100. Identify the value of the digits.	Find the effect of multiplying and dividing a one or two-digit number by 10 and 100. Identify the value of the digits in the answer as ones, tenths and hundredths.	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.

	Calculation Methods (Formal and Informal)					
	Make connections between arrays, number patterns and counting in 2s, 5s and 10s. Through grouping, begin to understand multiplication, doubling numbers and quantities.	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using x, ÷ and = signs.	Write and calculate mathematical statements for multiplication using the multiplication tables that they know			
			Multiply two-digit numbers by one-digit numbers, progressing to formal written methods of short multiplication.	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout of short multiplication.	Multiply numbers up to 4-digits by a one or two-digit number using a formal written methods, including long multiplication for two-digit numbers.	Multiply multi-digit numbers up to 4-digits by a 2-digit whole number using the formal written method of long multiplication.
					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. Multiply one-digit numbers with up to two decimal places by whole numbers.
	Through grouping and sharing small quantities, begin to understand division.	Write division sentences for the multiplication facts they know.	Write and calculate mathematical statements for division using the multiplication facts they know.			

			Divide two-digit numbers by one-digit numbers, progressing to formal written methods of short division.	Divide numbers up to 3-digits by a 1-digit number using short division. Interpret remainders appropriately.	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 number using the formal written method of short division where appropriate, interpreting remainders according to the context. Divide numbers up to 4-digits by a 2-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 context. Use written division methods in cases where the answer has up to two decimal places.

Inverse Operations, Estimating and Checking Answers						
			Use estimation and inverse to check answers to calculations.	Use estimation and inverse to check answers to calculations.	Use estimation and inverse to check answers to calculations.	Use estimation, rounding and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
Properties of Numbers						
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.				Recognise and use factor pairs.	Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Identify common factors, common multiples and prime numbers. Relate common factors to finding equivalent fractions.
					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.	Recall prime numbers beyond 19.

| | | | | Begin to recognise square numbers as the product of a number multiplied by itself. | Recognise and use square numbers and cube numbers, and the notation for squared and cubed. | |

Problem Solving						
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with support.	Solve problems involving multiplication and division: • Using materials • Arrays • Repeated addition • Mental methods • Multiplication and division facts • Problems in contexts • Missing numbers	Solve problems, including: • Missing number problems • Multiplication and division (remainders) • Positive integer scaling • Correspondence in which n objects are connected to m objects • Deciding which of the 4 operations to use and why.	Solve 2-step problems in context involving multiplying and adding, including using: • The distributive law to multiply two digit numbers by one digit. • Division – including remainders • Integer scaling problems • Harder correspondence problems such as n objects are connected to m objects	Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign and using missing numbers. Solve problems involving multiplication and division including: • Scaling by simple fractions and problems involving simple rates. • Using knowledge of factors and multiples, squares and cubes.	Solve problems involving addition, subtraction, multiplication and division including those with missing numbers.

		Ready-To-Progress Criteria			
		2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.	**3MD-1** Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division.	**4MD-1** Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.	**5MD-1** Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	**For Year 6, MD Ready-to-Progress criteria are combined with AS Ready-to-Progress criteria (please see above)**
		2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division).		**4MD-2** Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	**5MD-2** Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.	
				4MD-3 Understand and apply the distributive property of multiplication.	**5MD-3** Multiply any whole number with up to 4-digits by any one-digit number using a formal written method.	
					5MD-4 Divide a number with up to 4-digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	

Fractions, Decimals, Percentages, Ratio and Proportion					
Counting in Fractional Steps					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Count in steps of ½	Count in fractions up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line (for example 1 ¼, 1 $^2/_4$, or 1 ½ , 1 ¾ , 2)	Count up and down in tenths. Count up and down in tenths and 0.1.	Count up and down in hundredths. Count using simple fractions and decimals both forwards and backwards. Count up and down in hundredths and 0.01	Count forwards and backwards in simple fractional steps including bridging zero.	Be confident in counting forwards and backwards in differing fractional steps.
Fractions of objects, shapes and quantities					
Recognise, find and name a half as one of two equal parts of an object, shape or quantity.	Recognise, find, name and write fractions $^1/_3$, ¼, $^2/_4$ and ¾ of a length, shape, set of objects or quantity.	Recognise, find, name and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Using the times tables that they are secure with. Recognise, find and write fractions of a discrete set of objects including measures and shapes; unit fractions and non-unit fractions with small denominators. Using the times tables that they are secure with.	Continue to recognise, find and write fractions of a discrete set of objects including measures and shapes. Find unit fractions and non-unit fractions with small denominators – using the times tables that they are secure with.	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalence	Be confident when working with fractions. Be able to find any fractions of quantities, measures and numbers using multiplication and division to work these out quickly.

Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.		Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.	Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.		
Recognise and combine halves and quarters as part of a whole.	Write simple fractions. E.g. ½ of 6 = 3 and recognise the equivalence of $^2/_4$ and ½	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers; unit fractions and non-unit fractions with small denominators using a number line and going beyond 1.	Extend use of number line to connect fractions, numbers and measures.		
Comparing and Ordering Fractions					
	Compare and order $^1/_3$, ¼ and ½	Compare and order unit fractions, and fractions with the same denominators.	Continue to compare and order unit fractions and non-unit 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.

Addition and Subtraction of Fractions					
	Add and subtract ½ and ¼ from a given number to 10.	Add and subtract fractions with the same denominator within one whole.	Add and subtract fractions with the same denominator. Beyond a whole	Add and subtract fractions with the same denominator and denominators that are multiples of the same number.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
				Write mathematical statements >1 as a mixed number. $^2/_5 + {}^4/_5 = {}^6/_5 = 1\,{}^1/_5$	
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. ¼ x ½ = $^1/_8$
					Divide proper fractions by whole numbers (using diagrams).
					Associate a fraction with division and calculate decimal fraction equivalents. E.g. 0.375 for a simple fraction E.g. 3/8

Counting in Decimal Steps					
		Count up and down using decimal tenths. E.g. 0.1, 0.2, 0.3	Count up and down using decimal hundredths. E.g. 0.01, 0.02, 0.03

Count using decimals both forwards and backwards. | Count forwards and backwards in decimal steps including bridging zero (up to 3 decimal places) | To continue to count forwards and backwards in decimal steps up to 3 decimal places. |
| **Comparing and Ordering Decimals** | | | | | |
| | | Use knowledge of tenths to help compare and order numbers with one decimal place.

Identify the value of each digit and represent on a number line. | Order and compare numbers with the same number of decimal places and up to two decimal places.

Identify the value of each digit in a decimal number.

Represent decimals on a number line. | Read, write, order and compare numbers with up to three decimal places.

Understand the value of each digit within a decimal number with 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. | Continue to round decimals with one and two decimal places and extend to three decimal places.

Round three place decimals to the nearest tenth or hundredth. |

			Addition and Subtraction of Decimals		
			Add and subtract decimals with up to two decimal places using the formal written methods of columnar addition and subtraction.	Add and subtract decimals with two decimal places using formal written methods. Add and subtract decimals, including: • A mix of whole numbers and decimals. • Decimals with different numbers of decimal places. • Complements of 1 (E.g. 0.83 + 0.17)	Continue to develop the skills learnt previously and extend to working with decimals up to three places.
			Multiplication and Division of Decimals		
					Multiply and divide one digit numbers with up to two decimal places by 10 and 2-digit whole numbers.
	Find the effect of multiplying a one or two-digit number by 10 and identify the value of the digits.	Find the effect of multiplying a one-digit number by 10 and 100; identify the value of the digits.	Find the effect of multiplying and 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 whole numbers and those involving decimals by 10, 100 and 1000.	Multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places.

		Understanding Percentages			
	Recognise %. Know that ½ = 50%	Recognise %. Understand that % means 'number of parts per 100'. Understand that ½ = 50%; ¼ = 25%	Recognise %. Understand that % means 'number of parts per 100'. Understand that ¾ = 75% and 100% = 1	Recognise the percent symbol and understand that percent relates to 'the number of parts per 100' and write percentages as a fraction with denominator 100, and as a decimal.	Write percentages as a fraction and a decimal.
		Equivalence (Including Fractions, Decimals and Percentages)			
	Recognise the equivalence of $^2/_4$ and ½	Recognise and show, using diagrams, equivalent fractions with small denominators.	Recognise and show, using diagrams, families of common equivalent fractions. Use factors and multiples to recognise equivalent fractions and simplify where appropriate (E.g. $^6/_9$ = $^2/_3$ or ¼ = $^2/_8$)	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 that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.	Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by 10.	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	Associate a fraction with division and calculate decimal fraction equivalents. Round recurring decimals to three decimal places, or other approximations depending on the context.

| | | Understand 50% = ½ | Understand that 50% = ½ = 0.5

Understand that 25% = ¼ | Recognise and write decimal and percentage equivalents to ¼, ½, ¾ and any number of tenths and hundredths. | Read and write decimal numbers as fractions and percentages. | Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. |
|---|---|---|---|---|---|---|
| **Ratio and Proportion** | | | | | | |
| | | | | | | Solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication and division facts.

Use notation a:b

Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Solve problems involving similar shapes where the scale factor is known or can be found. |

Problem Solving					
Solve problems involving finding ½ and ¼ of discrete and continuous quantities, using shapes, objects and quantities.	Use fractions as 'fractions of discrete and continuous quantities by solving problems using shapes, objects and quantities'.	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 fractions.	Solve problems involving fractions that mean working backwards. E.g. If ¼ of a length is 36cm, then the whole length is 36 x 4
			Solve simple measure and money problems involving fractions to two decimal places.	Solve problems involving multiplication and division, scaling by simple fractions.	
			Solve simple measure and money problems involving decimals to two decimal places.	Solve problems involving numbers up to three decimal places.	Continue to solve problems involving numbers up to three decimal places.
					Solve problems which require answers to be rounded to specified degrees of accuracy.
		To solve problems finding 50% of amounts.	To solve problems finding 25%, 50% and 75% of amounts.	Solve problems which require knowing percentage and decimal equivalents of ½, ¼, $^1/_5$, $^2/_5$, $^4/_5$ and those fractions with a denominator of a multiple of 10 or 25. Find simple percentages of amounts when solving problems.	Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and use the percentages for comparison.

		Ready-to-Progress Criteria			
		3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.			**6F-1** Recognise when fractions can be simplified, and use common factors to simplify fractions.
		3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency)		**5F-1** Find non-unit fractions of quantities.	**6F-2** Express fractions in a common denomination and use this to compare fractions that are similar in value.
		3F-3 Reason about the location of any fraction within 1 in the linear number system.	**4F-1 Reason** about the location of mixed numbers in the linear number system.		**6F-3** Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.
			4F-2 Convert mixed numbers to improper fractions and vice versa.	**5F-2** Find equivalent fractions and understand that they have the same value and the same position in the linear number system.	
		3F-4 Add and subtract fractions with the same denominator, within 1.	**4F-3** Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.	**5F-3** Recall decimal fraction equivalents for ½, ¼, $^1/_5$ and $^1/_{10}$, and for multiples of these proper fractions.	

Algebra					
Equations					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**`Year 6**
Solve one-step missing number problems involving: • Addition and subtraction • Number facts • Place value	Solve missing number problems involving: • Addition and subtraction • Multiplication and division • Number facts • Place value	Solve missing number problems involving: • The four operations • Number facts • Place value	Solve missing number problems involving: • Addition and subtraction • Multiplication and division • Number facts • Place value	Solve missing number problems involving: • Addition and subtraction • Multiplication and division • Number facts • Place value Missing lengths and angles.	Express missing number problems algebraically. Solve missing number problems including: • Ratio • Lengths • Angles • Coordinates • 4 operations • Number facts • Place value
Function Machine					
Use a one-step function machine when working with addition and subtraction. Such as, number bonds.	Use a one-step function machine with addition, subtraction and multiplication.	Use a two-step function machine with all four operations: addition, subtraction, multiplication and division.	Use a two-step function machine with all four operations and include negative numbers.	Use two-step function machines with all four operations where you start with the answer and work backwards.	Use two-step function machines with all four operations where you start with the answer and work backwards.
Balance Puzzles					
Calculate number sentences with one unknown. E.g. 9 = ? – 5 *(Taken from Addition and Subtraction)*	Calculate number sentences with one or more unknown factors (on one side of the balance) E.g. ? + 5 = 20 ? + ? = 50	Calculate number sentences with two unknown factors which are on one side of the balance. E.g. 48 = ? x ? ? + ? = 350	Calculate number sentences with two unknown factors which are on one side of the balance. Include fractions and decimals with one decimal place. E.g. 7.8 = ? + ? ? x ? = 150	Calculate number sentences with two unknown factors which are on different sides of the balance. E.g. ? + 5 = 25 - ?	Find pairs of numbers that satisfy number sentences involving two unknowns. E.g. 60 - ? = ? + 5

Formula					
			Perimeter can be expressed algebraically as 2(a + b) where a and b are the same dimensions in the same unit. *(Taken from Measurement)*	Find missing lengths. E.g. A rectangle with a perimeter of 20cm and sides 2cm and b cm is 4 + 2b = 20 *(Taken from Measurement)*	Use simple formulae. Enumerate all possibilities of combinations of two variables. 4a + 6b = 50
					Recognise when it is possible to use formulae for area and volume of shapes. *(Taken from Measurement)*
					Calculate the area of parallelograms and triangles. *(Taken from Measurement)*
Sequences					
Describe and continue linear number sequences. E.g. link to work on counting.	Describe and continue linear number sequences. E.g. link to work on multiplication tables and counting.	Describe and continue linear number sequences. E.g. link to work on multiplication tables and counting.	Describe and continue linear number sequences. E.g. link to work on multiplication tables and counting.	Generate and continue, recognise and describe linear number sequences. E.g. 3 3 ½ 4 4 ½ including those involving fractions and decimals and find the term-to-term rule in words. *Taken from Number and Place Value)*	Generate, describe and continue linear sequences.

| | | | Be able to describe non-linear sequences and continue them.

E.g. square numbers. | Be able to describe non-linear sequences and continue them.

E.g. Square numbers, triangular numbers and prime numbers. | Be able to describe non-linear sequences and continue them.

E.g. Square numbers, triangular numbers, prime numbers and Fibonacci. |
|---|---|---|---|---|---|
| Sequence events in chronological order using language such as: before and after; next, first, today, yesterday, tomorrow, morning, afternoon and evening.

(Taken from Measurement) | Compare and sequence intervals of time.

(Taken from Measurement) | | | | |
| Recognise and create repeating patterns, objects and shapes.

(Taken from Number and Place Value and also in Properties of Shapes) | Order and arrange combinations of mathematical objects in patterns and sequences.

(Taken from Position and Direction) | | | | |
| | Work with patterns of shapes including those in different orientations.

(Taken from Position and Direction) | | | | |

Measurement						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Reading Scales						
Three and Four-Year Olds **Reception** **Early Learning Goals**	Read the numbered division on a scale and interpret the divisions between them (E.g. on a scale 0 – 20 with intervals of 1 shown but only the divisions 5, 10, 15 and 20 numbered)	Read to the nearest division scales that are numbered or partially numbered.	Read to the nearest division and half division scales that are numbered or partially numbered.	Interpret intervals and divisions on partially numbered scales.	Interpret a reading that lies between two numbered divisions on a scale.	Interpret a reading that lies between two numbered divisions on a scale.
Length and Height						
Make comparisons between objects relating to size, length, weight and capacity. Compare length, weight and capacity.	Measure and begin to record lengths and heights. Move from using non-standard units to using standard units that are manageable for them.	Choose and use appropriate standard units to estimate and measure length/height in any direction in m/cm to the nearest appropriate unit using rulers and meter rules. Understand that 100cm = 1m. Understand that 1m = 100cm	Estimate, measure, add and subtract lengths (m, cm, mm). Understand that 10mm = 1cm. Understand that 1cm = 10mm.	Estimate and calculate lengths. Use, read and write standard units of length using decimal notation to one decimal place. Understand that 1000m = 1 km Understand that 1km = 1000m	Use, read and write standard units of length using decimal notation to two decimal places.	Use, read and write standard units of length using decimal notation to three decimal places.

		Draw lines and shapes using a straight edge. (Taken from Properties of Shapes)	*Connect decimals and rounding to drawing and measuring straight lines in cm in a variety of contexts. (Taken from Properties of Shapes)*		*Draw accurate lines with a ruler to the nearest millimetre (Taken from Properties of Shapes)* *Use conventional markings for parallel lines (Taken from Properties of Shapes)*	

➢	Compare and describe lengths and heights.
	  ➢ Long/short
	  ➢ Longer/shorter
	  ➢ Tall/short
	  ➢ Taller/shorter
	
	Move from comparing with non-standard units to using standard units that they can manage.
		Compare and order lengths and record the results using >, < and =
		
		Compare measures including simple multiples such as 'half as high' , 'twice as wide'.
			Compare lengths (m. cm, mm)
			
			Include:
			  ➢ Mixed units. E.g. 2m, 5cm
			  ➢ Simple scaling by integers. E.g. twice as long, five times as high.
			
			Understand the relationship between mm and cm, cm and m in order to compare mixed units.
				Compare a range of different lengths.		

		Understand that 10mm is the same as 1cm and use practical equipment to prove this and multiples of 10.	Understand that 100 cm = 1m and that 1m = 100cm. Understand the need to x and ÷ by 100 to convert between the two. Understand that you need to x and ÷ by 10 to convert between mm and cm.	Convert between different units of measure (E.g. metres to kilometres) using decimal notation to at least 1-decimal place.	Convert between different units of metric measure (E.g. km and m; cm and m; cm and mm) using decimal notation to 2-decimal places.	Convert between standard units converting measurements of length from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to 3-decimal places.
				Understand that other units of measure exist, such as inches and feet and these are another way of measuring things.	Understand and use approximate equivalences between metric and common imperial units such as inches.	Convert between miles and kilometres. *Read graphs to convert km to miles (Taken from Statistics).*

			Measure the perimeter of simple 2D shapes.	Measure and calculate the perimeter of a rectilinear figure in cm and m. *Perimeter can be expressed as 2(a + b) where a and b are the dimensions in the same unit (Taken from Algebra)*	Measure and calculate the perimeter of composite rectilinear shapes in cm and m. *Find missing lengths. E.g. a rectangle with a perimeter of 20cm and sides 2cm and bcm is 4 + 2b = 20 (Taken from Algebra)*	Recognise that shapes with the same areas can have different perimeters and vice versa.
	Find the approximate areas of everyday objects using non-standard units and non-standard vocabulary. E.g. 10 cubes can cover that rectangle. 12 hands can cover the surface of the chair.	Find the approximate area of everyday objects by counting whole squares.	Find the approximate area of everyday objects by counting squares and ½ squares and combining these.	Find the area of rectilinear shapes by counting squares. Relate area to arrays and multiplication. (Length x Width)	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. Calculate the area from scale drawings using given measurements. Calculate the area of composite rectilinear shapes by splitting into rectangles.	Calculate the area of parallelograms and triangles. Recognise when it is possible to use the formulae for area of shapes. Recognise that shapes with the same areas can have different perimeters and vice versa.

Area and Perimeter

Mass						
Make comparisons between objects relating to size, length, weight and capacity. Compare length, weight and capacity.	Measure and begin to record mass/weight. Move from using non-standard units to standards units that they can manage. Use appropriate measuring tools.	Choose and use appropriate standard units to estimate and measure mass (kg/g) to the nearest appropriate unit using scales. Understand that 1000g is the same as 1kg and use practical resources to prove this.	Estimate, measure, add and subtract units of mass (kg and g) Understand that 1000g is the same as 1kg and extend to understanding that 2000g is the equivalent of 2kg. Use practical equipment to prove this.	Estimate and calculate mass. Use, read and write standard units of mass using decimal notation to at least one decimal place.	Use, read and write standard units of mass using decimal notation to two decimal places.	Use, read and write standard units of mass using decimal notation to three decimal places.
	Compare and describe mass/weight. Use the language: ➢ Heavy/light ➢ Heavier than Lighter than Move from comparing non-standard units to common standard units that they can manage.	Compare and order mass and record the results using <, > = Compare measures include simple multiples such as: ➢ Half as heavy ➢ Twice as heavy	Compare mass (kg and g) Including: ➢ Mixed units E.g. 1kg and 200g ➢ Simple scaling by integers. E.g. 4 times as heavy	Compare a range of different masses. Understand the equivalence between 1000g and 1kg. understand that they need to x and ÷ by 1000 to convert between the units of measure. Order a range of masses.		

				Use simple equivalence of mixed units. E.g. 2kgs = 2000g.	Convert between different units of metric measure (E.g. kg and g) Use decimal notation to at least 1-decimal place.	convert between different units of metric measure. Use decimal notation up to 2-decimal places.	Convert between standard units converting measurement of mass from a smaller unit to a larger unit and vice versa (using decimal notation up to 3-decimal places)
					Understand that there are different units of measure for mass and that these are just another unit of measure.	Understand and use approximate equivalences between metric and common imperial units such as pounds.	

Capacity/Volume						
Make comparisons between objects relating to size, length, weight and capacity.

Compare length, weight and capacity. | Measure and begin to record capacity and volume.

Move from using non-standard units to common standard ones that they are comfortable using. Use appropriate measuring tools. | Choose and use appropriate standard units to estimate and measure capacity and volume (l and ml) to the nearest appropriate unit using measuring vessels.

Understand that 1000ml is the same as 1 litre and use measuring vessels to prove this. | Estimate, measure, add and subtract volume/capacity in l and ml.

Understand the difference between volume and capacity.

Understand that 1000 ml is the same as 1 litre and vice versa. Prove this using measuring vessels. | Estimate and calculate volume/capacity.

Understand how much more is needed to make 1 litre when calculating with different amounts.

Understand that 1000ml is the same as 1 litre and that you x and ÷by 1000 to convert between the measures. | Estimate and calculate volume (for example, using 1cm^3 blocks to build cuboids (including cubes) and capacity (for example, using water).

Use, read and write standard units of volume using decimal notation to two decimal places. | Use, read and write standard units of volume using decimal notation to three decimal places.

Calculate and estimate volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3) and extending to other units (for example mm^3 and km^3)

Recognise when it is possible to use the formulae for volume of shapes (Taken from Algebra) |

	Compare and describe capacity and volume. Use the language: ➢ Full/empty ➢ More than/less than ➢ Half ➢ Half full/half empty Quarter ➢ Quarter full/quarter empty Move from comparing using non-standard units to common standard units that are manageable for them.	Compare and order volume/capacity and record the results using < > and =. Use practical equipment to support the above. Compare measures including simple multiples such as: ➢ Half as full ➢ Twice as full	Compare mass (ml and l) Including: ➢ Mixed units E.g. 1l and 200ml ➢ Simple scaling by integers. E.g. 4 times as heavy Understand that 1000 ml is the same as 1 l and use practical equipment to prove this and multiples of 1000.	Compare a range of different volumes/capacities. Order a range of volume/capacity measures. Understand the equivalence between ml and l.		Compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3) and extending to other units (E.g. mm^3 and km^3)
			Use simple equivalence of mixed units. E.g. 3L = 3000ml	Convert between different units of metric measure (for example, litre and millilitre) Use decimal notation to at least one place.	Convert between different units of metric measure (for example, litre and millilitre) Use decimal notation to at least 2-places.	Convert between standard units, converting measurements of volume from a smaller unit to a larger unit and vice versa (using decimal notation up to 3-places)

				Understand that other units of measure exist, such as pints and these can be used to measure volume and capacity.	Understand and use approximate equivalences between metric and common imperial measures such as pints.	
			Temperature			
		Choose and use appropriate standard units to estimate and measure temperature to the nearest degree (°C) using thermometers.	Choose and use appropriate standard units to estimate and measure temperature to the nearest degree (°C) using thermometers. Record temperatures on a thermometer using negative numbers.	Order temperatures (positive and negative) using a number line. *Count backwards through 0 to include negative numbers. (Taken from Place Value)*	Order temperatures including positive and negative numbers.	Using the number line, add and subtract positive a negative integers for measures such as temperature.

Time						
Begin to describe a sequence of events, real or fictional, using words, such as 'first', 'then...'	Recognise and use language relating to dates, including days of the week, weeks, months, seasons and years.	Use vocabulary such as morning, afternoon, evening, am/pm.	Use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight.	Continue to support children's use of vocabulary relating to time. Introduce vocabulary relating to the 24-hour clock. Understand the terms analogue and digital.		
	Measure and begin to record time (hours, minutes and seconds)	Know the number of minutes in an hour and the number of hours in a day.	Know the number of seconds in a minute, and the number of days in each month, year and leap year.	Use a calendar to interpret whether dates are in the past, present or future.	Understand how to read timetables. Complete, read and interpret information on different timetables.	
	Compare and describe time using vocabulary: ➢ Quicker/slower ➢ Earlier/later ➢ Sooner Sequence events in chronological order using language: ➢ Before/after Next, first ➢ Today/yesterday tomorrow ➢ Morning/ afternoon/evening	*Compare and sequence intervals of time (Taken from Algebra)*	Record and compare time in terms of seconds, minutes and hours. Compare durations of events. (E.g. to calculate the time taken by particular events or tasks)	Work out time durations where the times cross the hour, using a mixture of 12-hour and 24-hour clock.		

		Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. *Tell the time during the day.* *Make whole, half, quarter, three-quarter turns in both directions and connect turning clockwise with movement on a clock face (Taken from Position and Direction)*	Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to shoe these times.	Tell and write the time from an analogue clock, including: ➢ Using Roman numerals from I to XII ➢ 12-hour clock ➢ 24-hour clock *Use digital 12-hour clock.* Estimate and read time with increasing accuracy to the nearest minute.	Read and write time on analogue and digital 12-hour and 24-hour clocks.	Continue to support children to read and write time on analogue and digital 12-hour and 24-hour clocks.	Use read and write standard units of time.
					Convert between different units of time (E.g. hour to minute) Convert time between analogue and digital 12-hour and 24-hour clocks.	Continue to support children to convert between different units of time.	Convert measurement of time from a smaller unit to a larger unit and vice versa. *Introduce to compound units of speed. E.g. miles per hour.*

Money					
	Recognise and know the value of different coins and notes.	Recognise and use symbols for pounds (£) and pence (p). Understand that you only use either the £ sign or the p sign, you don't use both together.	Understand how many 1p, 2p, 5p, 10p, 20p, 50p coins make a £1.	Understand how to use the fewest coins to make a certain amount of money.	
	Add together 2 or more coins and notes using practical equipment to support.	Combine amounts to make a particular value. Find different combinations of coins that equal the same amounts of money.	Add and subtract amounts of money. Add and subtract amounts of money, including mixed units. Add and subtract amounts of money to give change, using both £ and p in practical contexts. Initially record £ and p separately. Use decimal notation when appropriate for recording amounts of money.	Estimate, compare and calculate money in pounds and pence.	

Problem Solving					
	Solve practical problems for: ➢ Lengths and heights ➢ Mass/weight Capacity and volume ➢ Time ➢ Money	Solve simple problems in a practical context including addition and subtraction of money of the same unit, including giving change. Continue to solve practical problems involving: ➢ Length and heights ➢ Mass/weight ➢ Capacity and volume ➢ Time ➢ Money	Continue to solve practical problems involving: ➢ Length and heights ➢ Mass/weight ➢ Capacity and volume ➢ Time ➢ Money ➢ Temperature	Solve practical problems involving fractions and decimals to 2 decimal places for: ➢ Length and heights ➢ Mass/weight ➢ Capacity and volume ➢ Time ➢ Money ➢ Perimeter ➢ Temperature Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Use all four operations to solve problems involving measure, using decimal notation: ➢ Length ➢ Mass ➢ Volume ➢ Money using decimal notation ➢ Scaling ➢ Area ➢ Perimeter ➢ Time (using conversions) ➢ Temperature 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.

Geometry: Properties of Shapes

Identifying Shapes and Their Properties

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
2-D Shapes						
Three and Four-Year Olds **Reception** **Early Learning Goals** Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. Select, rotate and manipulate shapes in order to develop spatial reasoning skills	Recognise and name common 2-D shapes including: ➢ rectangles ➢ squares circles ➢ triangles	Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.	Identify and describe the properties of 2-D shapes, using: ➢ accurate language ➢ length of lines ➢ acute and obtuse angles	Identify and describe the properties of 2-D shapes: ➢ language ➢ length of lines ➢ angles ➢ symmetry	Identify and describe the properties of 2-D shapes: ➢ language ➢ length of lines ➢ angles ➢ symmetry Identify 3-D shapes, including cubes and other cuboids from 2-D representations.	Identify and describe the properties of 2-D shapes: ➢ language ➢ length of lines ➢ angles ➢ symmetry Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius d = 2 x r
	Handle 2-D shapes, naming them and related everyday objects.	Handle and name a wide variety of 2-D shapes including quadrilaterals, polygons.	Increase their knowledge of 2-D shapes including different quadrilaterals and polygons ensuring they understand their properties.			

	Recognise 2-D shapes in different orientations and sizes.	Recognise a wider variety of 2-D shapes in different orientations and sizes.	Recognise the new polygons and quadrilaterals in different orientations and sizes.			
		Introduce the terms horizontal and vertical when talking about shapes.	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.		Use conventional markings for parallel lines.	

3-D Shapes

Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.	Recognise and name common 3-D shapes including: ➢ cuboids ➢ cubes pyramids ➢ spheres	Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces.	Identify and describe the properties of 3-D shapes, including: ➢ accurate language ➢ length of lines ➢ acute and obtuse angles ➢ number of edges, vertices and faces	Identify and describe the properties of 3-D shapes, including: ➢ the number of edges, vertices and faces ➢ length of lines ➢ acute and obtuse angles	Identify and describe the properties of 3-D shapes, including: ➢ the number of edges, vertices and faces ➢ length of lines ➢ acute and obtuse angles	Identify and describe the properties of 3-D shapes, including: ➢ the number of edges, vertices and faces ➢ length of lines ➢ acute and obtuse angles
Select, rotate and manipulate shapes in order to develop spatial reasoning skills	Handle 3-D shapes, naming them and related everyday objects.	Handle and name a wide variety of common 3-D shapes including cuboids, prisms and cones.	Recognise 3-D shapes in different orientations and describe them.			
	Recognise 3-D shapes in different orientations and sizes.		Extend knowledge of properties of shape to symmetrical and non-symmetrical polyhedra.			

			Symmetry		
		Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.	Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical and horizontal line of symmetry.	Complete a symmetrical figure with respect to a specific line of symmetry, to include a diagonal line.	
			Extend knowledge of properties of shape to symmetrical and non-symmetrical polygons.	Identify lines of symmetry in 2-D shapes presented in different orientations.	
				Draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry.	
				Recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape.	

Angles					
	Describe position, direction and movement, including whole, half, quarter and three-quarter turns.	Use mathematical vocabulary to describe position and direction and 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). To include practical contexts. E.g., Pupils themselves moving in turns, giving instructions to other pupils to do so and programming robots using instructions given in right-angles.	Recognise angles as a property of shape or a description of a turn.	Identify acute and obtuse angles and compare and order angles by up to two right angles by size.	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Use the symbol for a right angle.	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing 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 right angles, recognise that two right-angles make a half-turn, three make three-quarters of a turn and four a complete turn.	Identify: ➤ 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°	

			Identify whether angles are greater than or less than a right angle. Use acute and obtuse.	Understand that: ➢ an obtuse angle is larger than 90° but smaller than 180° ➢ understand that a right-angle is 90° ➢ understand that an acute angle is less than 90°		
					Use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals.	
					Use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.	Describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements. Express algebraically. E.g. a = 180 – (b+c)

Comparing and Classifying						
Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.		Identify, compare and sort common 2-D and 3-D shapes and everyday objects, on the basis of their properties and use vocabulary precisely such as sides, edges, vertices and faces.	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 (Also in Algebra)	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
	Interpret and sort shapes using Venn and Carroll diagrams (from Statistics).	Interpret and sort shapes using Venn and Carroll diagrams (from Statistics)	Interpret, sort and present data with shapes using Venn and Carroll diagrams (from Statistics).			
				Compare lengths and angles to decide if a polygon is regular or irregular.	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	

Drawing and Constructing						
Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Combine shapes to make new ones - an arch, a bigger triangle etc. Select, rotate and manipulate shapes in order to develop spatial reasoning skills. Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.	Draw lines using a straight edge and attempt to draw shapes that they are learning the names of.	Draw lines and shapes using a straight edge.	Draw 2-D shapes and make 3-D shapes using modelling materials.	Draw acute and obtuse angles. Draw nets of simple 3-D shapes.	Draw given angles, and measure them in degrees (°). Draw nets of 3-D shapes.	Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets.
			Connect decimals and rounding to drawing and measuring straight lines in cm in a variety of contexts.	Draw accurate lines with a ruler to the nearest cm and ½ cm.	Draw accurate lines with a ruler to the nearest millimetre.	

Patterns with Shapes						
Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Continue, copy and create repeating patterns.	Recognise and create repeating patterns with up to 3 colours, objects and shapes (from Place Value, also in Algebra)	Order and arrange combinations of mathematical objects in patterns and sequences (from Position and Direction and also in Algebra).				
		Work with patterns of shapes in different orientations (from Position and Direction and also in Algebra)				

Geometry: Position and Direction						
Location, Movement and Co-ordinates						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Three and Four-Year Olds **Reception** **Early Learning Goals** Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'. Draw information from a simple map.	Describe position, direction and movement, including whole, half, quarter and three-quarter turn, (also in Properties of Shapes). ➤ Use the language: Left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far. Up and down, forwards and backwards, inside and outside.	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) To include practical contexts (E.g. pupils themselves moving in turns and giving instructions to other pupils to do so and programming robots using instructions given in right angles (also in Angles)	Recognise that two right angles make half a turn; three make three-quarters of a turn and four a complete turn (from Properties of Shapes)	Recognise that two right angles make half a turn; three make three-quarters of a turn and four a complete turn (from Properties of Shapes)	Recognise that two right angles make half a turn; three make three-quarters of a turn and four a complete turn (from Properties of Shapes) and include the degrees of the turns.	Recognise that two right angles make half a turn; three make three-quarters of a turn and four a complete turn (from Properties of Shapes) and include the degrees of the turns.

	Make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face (also in Telling the Time).					
			Plot coordinates on a grid.	Describe positions on a 2-D grid as coordinates in the first quadrant. Draw a pair of axes in one quadrant with equal scales and integer labels.	Describe the positions on the full coordinate grid (all four quadrants) Draw a pair of axes in one quadrant with equal scales and integer labels.	Describe positions on the full coordinate grid (all four quadrants) Draw and label a pair of axes in the 4 quadrants with equal scaling.
			Plot coordinates on a grid to draw a shape.	Plot specified points and draw sides to complete a given polygon.	Identify the coordinates of a missing vertex of a shape on an unlabelled axis.	Draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically. E.g. translating vertex (a, b) to $(a – 2, b + 3)$; (a, b) and $(a + d, b + d)$ being opposite vertices of a square of side d.

Translation					
				Describe movements between positions as translations of a given unit to the left/right and up/down.	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.	Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Ready-to-Progress Criteria for Geometry					
	1G-1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.	**2G-1** Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.	**3G-1** Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.		**5G-1**Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.	
					5G-2 Compare areas and calculate the area of rectangles (including squares) using standard units.	

	1G-2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.		3G-2 Draw polygons by joining marked points and identify parallel and perpendicular sides.	4G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.		6G-1 Draw, compose and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.
				4G-2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-length are equal and the angles are equal. Find the perimeter of regular and irregular polygons.		
				4G-3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.		

Statistics					
Interpreting, Constructing and Presenting Data					
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 construct simple pictograms with simple ratio 2, 5 and 10, 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 (connect to work on angles and fractions). Draw graphs relating to variables arising from own work.
Interpret and sort numbers and shapes using Venn and Carroll diagrams (also in Properties of Shapes).	Interpret and sort numbers and shapes using Venn and Carroll diagrams (also in Properties of Shapes).	Interpret and present data using bar charts, pictograms, tables, Venn and Carroll diagrams (also in Properties of Shapes.)		Describe which representation of data is most appropriate and why.	Read graphs to convert km to miles (also in Measurement)
Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.	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.	Ask and answer questions about totalling and comparing categorical data.				

Reading Scales					
		Understand and use simple scales. E.g. 2, 5, 10 units per cm in pictograms and bar charts.	Understand and use a greater range of scales in representations.	Understand and use a greater range of scales in their representations.	Understand and use a greater range of scales in their representations.
Read the numbered divisions on a scale and interpret the divisions between them. (E.g. on a scale 0-20 with intervals of 1 shown but only the divisions 5, 10, 15 and 20 numbered).	Read to the nearest division, scales that are numbered or partially numbered.	Read to the nearest division and half division, scales that are numbered or partially numbered.	Interpret intervals and divisions on partially numbered scales.	Interpret a reading that lies between two numbered divisions on a scale.	Interpret a reading that lies between two numbered divisions on a scale.
Mean, Median, Mode and Range					
			Collate and interpret the mode, median and range.	Collate and interpret the mode, median and range.	Calculate and interpret the mean as an average.
Problem Solving					
Solve one-step questions using information presented in pictograms, tally charts, block diagrams and tables.	Solve one-step leading to two-step questions using information presented in pictograms, tally charts, block diagrams and tables.	Solve one-step and two-step questions 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.	Solve problems from a range of graphical representations.