



First Level to Fourth Level

Copyright and Disclaimer

Fife Council is the owner of the copyright in this work and all rights are reserved.

No part of this work may be edited, copied or otherwise reproduced, whether electronically or mechanically without the written permission of Fife Council.

This work is intended for use in accordance with the wider professional learning programme provided by Fife Council's Professional Learning Team. Only authorised Fife Council users or authorised licensees under the said programme are permitted to use these materials. All other uses of this work are prohibited.

Enquiries about the Council's professional learning programme and the use of this work should be directed to: Fife Council Pedagogy Team at Pedagogy.team@fife.gov.uk



Number, Money and Measure

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
-------------	--------------	-------------	--------------

At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.

Estimating and Rounding

<p><i>I can share ideas with others to develop ways of estimating the answer to a calculation or problem, work out the actual answer, then check my solution by comparing it with the estimate.</i> MNU 1-01a</p>	<p><i>I can use my knowledge of rounding to routinely estimate the answer to a problem then, after calculating, decide if my answer is reasonable, sharing my solution with others.</i> MNU 2-01a</p>	<p><i>I can round a number using an appropriate degree of accuracy, having taken into account the context of the problem.</i> MNU 3-01a</p>	<p><i>Having investigated the practical impact of inaccuracy and error, I can use my knowledge of tolerance when choosing the required degree of accuracy to make real-life calculations.</i> MNU 4-01a</p>
<p>ESTIMATION</p> <ul style="list-style-type: none"> Estimate quantities to 100 or beyond. Using a variety of strategies, estimate the answer to a calculation, with reasoning. Use a number line to support estimation. Evaluate the reasonableness of answers by comparing the estimate and the final answer. <p>ROUNDING</p> <ul style="list-style-type: none"> Understand which multiple of 10, 100 or 1000 any given number is closest to. Use a number line to support rounding. Round whole numbers to the nearest 10, 100 or 1000. 	<p>ESTIMATION</p> <ul style="list-style-type: none"> Estimate the answer to a calculation, with reasoning. When solving a problem, estimate prior to calculating. Use a number line to support estimation and rounding. Estimate sum, difference, product and quotient in real life situations including decimal fractions and fractions. <p>ROUNDING</p> <ul style="list-style-type: none"> Understand that rounding allows for an approximate answer. Explore situations which require rounding up or rounding down. Round whole numbers to the nearest 1000, 10 000, 100 000. Round numbers with 2 decimal places to the nearest whole number. Use rounded numbers when estimating solutions in calculations. 	<p>ESTIMATION</p> <ul style="list-style-type: none"> Realise that for multipliers less than 1, multiplication generates a smaller number and for divisors less than 1, division generates a greater number. Explain methods and answers using the vocabulary of estimation and rounding including upper and lower bounds. Use strategies to evaluate the reasonableness of answers. Estimate and make approximations in real life situations using fractions, decimal fractions and percentages. <p>ROUNDING</p> <ul style="list-style-type: none"> Understand that the context of the question needs to be considered when rounding. Round decimal fractions to three decimal places. Use rounding to routinely estimate the answer to calculations. 	<p>ESTIMATION & ROUNDING</p> <ul style="list-style-type: none"> Realise that different degrees of accuracy are acceptable in different situations. Realise that initial rounding can lead to inaccuracy in a calculation. Interpret measurements given in tolerance notation including percentage limits. When working with decimal numbers, explain your methods and answers using the vocabulary of estimation and rounding including upper and lower bounds. Express required accuracy using tolerance notation. Have an understanding of the level of tolerance that would be acceptable in different situations. Justify whether a measurement meets the required tolerance.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
-------------	--------------	-------------	--------------

At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.

Number and Number Processes

<p><i>I have investigated how whole numbers are constructed, can understand the importance of zero within the system and can use my knowledge to explain the link between a digit, its place and its value.</i> MNU 1-02a</p> <p><i>I can use addition, subtraction, multiplication and division when solving problems, making best use of the mental strategies and written skills I have developed.</i> MNU 1-03a</p>	<p><i>I have extended the range of whole numbers I can work with and having explored how decimal fractions are constructed, can explain the link between a digit, its place and its value.</i> MNU 2-02a</p> <p><i>Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others.</i> MNU 2-03a</p> <p><i>I have explored the contexts in which problems involving decimal fractions occur and can solve related problems using a variety of methods.</i> MNU 2-03b</p> <p>Having explored the need for rules for the order of operations in number calculations, I can apply them correctly when solving simple problems. MTH 2-03c</p> <p><i>I can show my understanding of how the number line extends to include numbers less than zero and have investigated how these numbers occur and are used.</i> MNU 2-04a</p>	<p><i>I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions.</i> MNU 3-03a</p> <p><i>I can continue to recall number facts quickly and use them accurately when making calculations.</i> MNU 3-03b</p> <p><i>I can use my understanding of numbers less than zero to solve simple problems in context.</i> MNU 3-04a</p>	<p><i>Having recognised similarities between new problems and problems I have solved before, I can carry out the necessary calculations to solve problems set in unfamiliar contexts.</i> MNU 4-03a</p> <p>I have investigated how introducing brackets to an expression can change the emphasis and can demonstrate my understanding by using the correct order of operations when carrying out calculations. MTH 4-03b</p>
---	--	--	--

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p><u>NUMBER WORD SEQUENCES</u></p> <ul style="list-style-type: none"> Orally count forwards and backwards up to 1000 and beyond from any given number. Read, write and order whole numbers up to thousands or beyond. Orally count forwards and backwards in 10s and 100s on and off the decade from any given number. Orally count forwards and backwards in intervals such as 2, 5, 3, 4 etc. Identify numbers before and after up to 1000 and beyond. Count forwards and backwards in both 1s and 10s simultaneously. Demonstrate understanding that zero is a place holder. Use mathematical vocabulary correctly. 	<p><u>NUMBER WORD SEQUENCES</u></p> <ul style="list-style-type: none"> Orally count forwards and backwards up to 1 000 000 and beyond from any given number. Orally count forwards and backwards in multiples of ten, hundred and thousand, on and off the decade from any given number. Orally count forwards and backwards in integers from any given number. Link the number word sequence for skip counting in 2s, 3s etc. to the times table facts. Read, write, compare and order whole numbers up to hundreds of thousands or beyond including negative numbers. Count forwards and backwards in tenths, hundredths, thousandths, including up to and over whole numbers. Count forwards and backwards in both 1s, 10s, 100s and decimal fraction parts simultaneously. 	<p><u>NUMBER WORD SEQUENCES</u></p> <ul style="list-style-type: none"> Continue to count forwards and backwards using integers, decimal fractions and fractions in increasingly complex increments and decrements. 	
<p><u>COUNTING</u></p> <ul style="list-style-type: none"> Find it obvious that when combining or joining collections, counting on will give the same answer as starting at the beginning and counting the lot. Realise that repeated addition or skip counting will give the same result as counting by ones. Count in multiplicative situations, simultaneously keeping track of the number of groups and the number in each group (e.g. by holding up four fingers) and counting repetitions of that same group. Represent multiplicative situations by drawing. Without prompting, select counting as a strategy to solve problems such as: Are there enough cups? Who has more? Will it fit? 			
<p><u>STRUCTURE OF NUMBER</u></p> <ul style="list-style-type: none"> Use materials or visualise to partition small numbers into parts e.g. 18 is the same as 15 with 3. Make sense of the notion that there are basic facts e.g. $4 + 5$ is always 9 no matter how they work it out or in what arrangement. Understand that a number within 1000 can be partitioned in a number of ways without changing the total quantity e.g. $65 = 38 + 27$. Model, represent and use numbers to thousands or beyond. Model or enact addition and subtraction of whole numbers. Model or enact multiplication and division of whole numbers. Think of addition and subtraction situations in terms of the whole and the two parts and which is missing. 			

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p><u>CALCULATING</u></p> <ul style="list-style-type: none"> • Use known facts to find unknown facts. • Use whole numbers up to thousands or beyond in real-life situations. • Select an appropriate method for solving a problem, for example, mental estimation, mental or written strategies or by using a calculator. • Explain how the Commutative Law can be used. • Select appropriate strategies to solve a two-step problem. <p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> • Understand situations that involve addition and subtraction including those with missing addends and subtrahends. • Investigate part-part-whole relationships, including those with missing addends and subtrahends. • Explore a range of strategies, both mental and written for adding and subtracting two-digit numbers. • Describe mental and written strategies for adding and subtracting two-digit numbers. • Use the language of addition and subtraction for example, 'add', 'take away', 'plus', 'minus', 'sum', 'difference'. • Use the inverse relationship between addition and subtraction to make a direct calculation possible e.g. reinterpret $43 - 27$ as "What do you have to add to 27 to get 43?" and so count on by tens and ones. • Use fast recall of addition and subtraction number facts in calculations. • Solve addition and subtracting problems with three-digit numbers. 	<p><u>CALCULATING</u></p> <ul style="list-style-type: none"> • Estimate a solution to a problem then check the solution using addition, subtraction, multiplication and division. • Explore rules for the order of operations in number calculations. • Describe mental and written strategies involving integers in everyday situations. • Use whole numbers up to a million or beyond in real-life situations. • Select and use an appropriate sequence of operations to solve multi-step word problems. • Select an efficient method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator. <p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> • Continue to develop a range of strategies, both mental and written for adding and subtracting numbers greater than 2 digits including decimal fractions including missing addends, minuends and subtrahends. • Describe mental and written strategies for adding and subtracting numbers greater than 2 digits including decimal fractions to 2 decimal places. • Use decimal fractions in real-life situations. • Continue to use the language of addition and subtraction for example, add, take away, plus, minus, sum, difference. 	<p><u>CALCULATING</u></p> <ul style="list-style-type: none"> • Continue to explore rules for the order of operations in number calculations such as <i>BODMAS</i>. • When using calculators, interpret the numbers displayed accurately. • Identify and apply an efficient method for solving a problem, for example, mental estimation, mental or written strategies, or by using a calculator. <p><u>Addition and Subtraction</u></p> <ul style="list-style-type: none"> • Describe and use mental and written strategies for adding and subtracting integers. • Describe mental and written strategies for adding and subtracting numbers greater than 2 digits including decimal fractions to 3 decimal places. 	<p><u>CALCULATING</u></p> <ul style="list-style-type: none"> • Explore rules for the order of operations in number calculations such as <i>BIDMAS</i>. • Explore the use of key sequences on a calculator e.g. the use of brackets, powers, inverse key, square root etc. • Use BIDMAS to calculate multi-step calculations including those with brackets. • Select the appropriate function keys on a calculator and apply them in the correct order. • Apply knowledge of order of operations in new and unfamiliar contexts with and without a calculator.
<p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> • Explore the link between odd and even numbers and dividing by two. • Understand and represent situations that involve multiplication and division including pictorial representations and arrays. • Use mental strategies for multiplication and division up to 25 or beyond in real life situations. Solve problems by multiplying or dividing by 10 and 100, where the answer is a whole number. 	<p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> • Model multiplication and division of whole numbers using arrays. • Understand clearly that if 3 rows of 5 is 15, then both 15 divided by 3 and one third of 15 are 5. • Know without calculating that four piles of nine objects must be the same amount as nine piles of four objects. • Understand why grouping and sharing problems can be solved by the same division process. • Interpret multiplication situations as 'times as much'. • Use the language of multiplication and division, for example, product, quotient, prime numbers and composite number. • Describe mental and written strategies for multiplication and division of whole numbers and decimal fractions to 2 decimal places. • Choose between multiplication or division to make calculating easier. 	<p><u>Multiplication and Division</u></p> <ul style="list-style-type: none"> • Know without calculating the multiplication and division facts to the 12th multiplication table. • Use partitioning to multiply or divide two numbers (of 2 digits or more). • Describe and use mental and written strategies for multiplying and dividing integers. • Describe mental and written strategies for multiplication and division of whole numbers and decimal fractions to 3 decimal places. <p><u>The Four Operations</u></p> <ul style="list-style-type: none"> • Explore the rules involved when calculating with negative numbers. • Read and interpret the operations required to solve both word problems and algorithms. 	<p><u>The Four Operations</u></p> <ul style="list-style-type: none"> • Explore how different methods can lead to the same answer. • Using knowledge of different methods, select the most efficient strategy to solve multi-step problems and record their working. • Using knowledge and understanding of different methods, select and justify their choices to solve multi-step problems. • Apply knowledge of the number system to solve real life problems and transfer skills from one context to another.

		<ul style="list-style-type: none"> Understand how relational thinking can help solve problems. Use calculators to solve problems by entering the correct operations and number order. Use the inverse relationship between + and - , x and ÷ to carry out calculations and solve problems. 	
FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
	<ul style="list-style-type: none"> Use the inverse relationship between multiplication and division to make a direct calculation possible. Select an appropriate multiplication or division operation on whole numbers including problems that are not easily interpreted as 'lots of' e.g. combination and comparison problems. Use sound recall of multiplication and division number facts in calculations. Use mental and written strategies for multiplication and division in real life situations. 	<ul style="list-style-type: none"> Use fast recall of both + and -, x and ÷ facts in calculations. Solve problems and explain reasoning both orally and in writing. 	
FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL

At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.

Multiples, Factors and Primes

	Having explored the patterns and relationships in multiplication and division, I can investigate and identify the multiples and factors of numbers. MTH 2-05a	<p>I have investigated strategies for identifying common multiples and common factors, explaining my ideas to others, and can apply my understanding to solve related problems. MTH 3-05a</p> <p>I can apply my understanding of factors to investigate and identify when a number is prime. MTH 3-05b</p>	
	<ul style="list-style-type: none"> Use the language of multiplication and division, for example, 'factor', 'multiple'. Describe written and mental strategies using multiples and factors for multiplication and division. Investigate the relationship between multiples and factors. Justify multiples and factors of given numbers. Select the most efficient multiple or factor for solving a real-life problem involving multiplication or division. 	<ul style="list-style-type: none"> Investigate the properties of prime numbers and explain how they have been identified. Investigate common multiples and common factors and explain how they have been identified. Use knowledge of multiples to identify the lowest common multiple (LCM) of a set of numbers and the highest common factor (HCF) of a set of numbers. Use the terms LCM and HCF. Find prime factors of a number using different methods. Express a number as a product of prime numbers using suitable methods. Use knowledge of multiples and factors to solve problems. Find the lowest common multiple of two numbers using their prime factors. 	

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Powers and Roots</p>			
		<p>Having explored the notation and vocabulary associated with whole number powers and the advantages of writing numbers in this form, I can evaluate powers of whole numbers mentally or using technology. MTH 3-06a</p>	<p>I have developed my understanding of the relationship between powers and roots and can carry out calculations mentally or using technology to evaluate whole number powers and roots, of any appropriate number. MTH 4-06a</p> <p>Within real-life contexts, I can use scientific notation to express large or small numbers in a more efficient way and can understand and work with numbers written in this form. MTH 4-06b</p>
		<ul style="list-style-type: none"> • Recognise and use index notation. • Understand the advantages of using index notation. • Understand exponents as repeated multiplication • Mentally or using calculator functions, solve calculations involving powers. • Evaluate whole number powers of a value. 	<ul style="list-style-type: none"> • Understand the relationship between whole number powers and roots. • Explore the idea of powers of ten and very simple single digit standard form numbers e.g. $5000 = 5 \times 10^4$ • Become familiar with the EXP or equivalent button on a scientific calculator. • Arrange numbers expressed in scientific notation in ascending and descending order. • Write calculations involving powers and roots correctly. • Mentally or using calculator functions, solve calculations involving powers and roots. • Estimate where a root would be placed on a number line. • Show that the square root is the inverse of squaring a number. • Demonstrate understanding of higher roots. • Convert large and small numbers between scientific notation and normal form and vice versa. • Use the EXP or equivalent buttons to use scientific notation on a calculator. • Apply knowledge of powers and roots to solve problems e.g. Pythagoras' Theorem. • Solve problems involving numbers written in scientific notation with and without a calculator.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Fractions, Decimals and Percentages</p>			
<p><i>Having explored fractions by taking part in practical activities, I can show my understanding of:</i></p> <ul style="list-style-type: none"> • how a single item can be shared equally • the notation and vocabulary associated with fractions • where simple fractions lie on the number line. <p style="text-align: center;"><i>MNU 1-07a</i></p> <p><i>Through exploring how groups of items can be shared equally, I can find a fraction of an amount by applying my knowledge of division.</i></p> <p style="text-align: center;"><i>MNU 1-07b</i></p> <p>Through taking part in practical activities including use of pictorial representations, I can demonstrate my understanding of simple fractions which are equivalent.</p> <p style="text-align: center;"><i>MTH 1-07c</i></p>	<p><i>I have investigated the everyday contexts in which simple fractions, percentages or decimal fractions are used and can carry out the necessary calculations to solve related problems.</i></p> <p style="text-align: center;"><i>MNU 2-07a</i></p> <p><i>I can show the equivalent forms of simple fractions, decimal fractions and percentages and can choose my preferred form when solving a problem, explaining my choice of method.</i></p> <p style="text-align: center;"><i>MNU 2-07b</i></p> <p>I have investigated how a set of equivalent fractions can be created, understanding the meaning of simplest form, and can apply my knowledge to compare and order the most commonly used fractions.</p> <p style="text-align: center;"><i>MTH 2-07c</i></p>	<p><i>I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real-life situations.</i></p> <p style="text-align: center;"><i>MNU 3-07a</i></p> <p>By applying my knowledge of equivalent fractions and common multiples, I can add and subtract commonly used fractions.</p> <p style="text-align: center;"><i>MTH 3-07b</i></p> <p>Having used practical, pictorial and written methods to develop my understanding, I can convert between whole or mixed numbers and fractions.</p> <p style="text-align: center;"><i>MTH 3-07c</i></p> <p><i>I can show how quantities that are related can be increased or decreased proportionally and apply this to solve problems in everyday contexts.</i></p> <p style="text-align: center;"><i>MNU 3-08a</i></p>	<p><i>I can choose the most appropriate form of fractions, decimal fractions and percentages to use when making calculations mentally, in written form or using technology, then use my solutions to make comparisons, decisions and choices.</i></p> <p style="text-align: center;"><i>MNU 4-07a</i></p> <p>I can solve problems involving fractions and mixed numbers in context, using addition, subtraction or multiplication.</p> <p style="text-align: center;"><i>MTH 4-07b</i></p> <p><i>Using proportion, I can calculate the change in one quantity caused by a change in a related quantity and solve real-life problems.</i></p> <p style="text-align: center;"><i>MNU 4-08a</i></p>
FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p><u>FRACTIONS</u></p> <ul style="list-style-type: none"> • Understand that the more portions to be made from a quantity, the smaller the size of each portion. • Find it obvious that two different shaped halves from the same size whole must be the same size and are not tricked by perceptual features. • Understand that a whole can be separated into equal parts called fractions. • Use the language of fractions for example, 'wholes', 'equal', 'halves', 'quarters', 'thirds', 'fractions', 'numerators', 'denominators'. • Visualise and describe halves and quarters. • Relate understanding of multiplication and division to situations involving fractions. • Explore equivalence through matching and comparing. • Visualise or draw own diagrams to compare fractions to show equivalence of simple, every day fractions. • Read, write, compare and order simple fractions on a number line including halves, quarters, thirds, fifths and tenths. • Model addition and subtraction of fractions with the same denominator. • Use fractional notation to record findings in problems involving fractions. • Partition a quantity into a number of equal portions to show unit fractions and, given a particular quantity, will say that one third is more than one quarter. • Use fractions in real-life situations. 	<p><u>FRACTIONS</u></p> <ul style="list-style-type: none"> • Can visualise an array to see, for example, that five blue counters is one third of a bag of 15 counters. • Relate fractions and division knowing, for example, that $\frac{3}{4}$ can be thought of as 3÷4 and 3 things shared among 4 pupils has to be $\frac{3}{4}$. • Create, model and write equivalent fractions. • Visualise or draw own diagrams to compare fractions with the same denominator (e.g. 3/7 and 5/7) or simple equivalence (e.g. $\frac{1}{4}$ and 2/8). • Read, write, compare and order fractions. • Represent common fractions both smaller and greater than 1 on a number line. • Recognise when a fraction is in its simplest form. • Simplify fractions using concrete materials. • Simplify fractions. • Select an appropriate number of partitions to enable a quantity e.g. 15 to be shared into two different numbers of portions e.g. either 5 or 3. • Model addition and subtraction of fractions with related denominators. • Add and subtract fractions with the same denominator. • Compare and order commonly used fractions using equivalence and simplest form. <p><u>DECIMAL FRACTIONS</u></p> <ul style="list-style-type: none"> • Use the idea of splitting a whole into parts to understand, for example, that 2.4 is 2 + 4/10 and 2.45 is 2 + 45/100. • Represent common and decimal fractions both smaller and greater than 1 on a number line. 	<p><u>FRACTIONS</u></p> <ul style="list-style-type: none"> • Understand simple fractions and their relationship with the whole. • Simplify fractions when calculating an answer. • Create equivalent fractions using knowledge of common multiples. • Model improper fractions and mixed numbers. • Convert improper fractions to mixed numbers and vice versa. • Locate and represent improper fractions on a number line. • Understand why common denominators make calculations easier. • Partition and recombine fractions visually or mentally to add or subtract e.g. $\frac{1}{2} + \frac{1}{4}$ is $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$. • Produce their own diagrams to compare or combine two fractions ensuring that both fractions (e.g. 2/3 and $\frac{1}{4}$) are represented on identical wholes. • Use mental and written strategies for the four operations with fractions. • Model unitary fraction multiplication and relate to bare numbers e.g. $\frac{1}{4} \times 3 = \frac{3}{4}$. • Model addition and subtraction with whole numbers and fractions. • Recognise the need to multiply in situations where the multiplier is a fractional number. • Apply understanding of unitary fraction multiplication to non-unitary fractions. <p><u>DECIMAL FRACTIONS</u></p> <ul style="list-style-type: none"> • Realise that for multipliers less than 1, multiplication generates a smaller number and for divisors less than 1, division generates a greater number. • Read, write, compare and order decimal fractions to thousandths or beyond. 	<p><u>FRACTIONS</u></p> <ul style="list-style-type: none"> • Model multiplication and division with fractions and mixed numbers e.g. $\frac{1}{4} \times \frac{3}{4}$. • Model addition and subtraction of mixed numbers. • Produce their own diagrams to show the four operations with fractions and mixed numbers. • Locate and represent fractions and mixed numbers on a number line. • Use mental and written strategies for the four operations with fractions and mixed numbers. • Use technology to solve problems involving the four operations with fractions and mixed numbers. <p><u>DECIMAL FRACTIONS</u></p> <ul style="list-style-type: none"> • Model multiplication and division of a decimal fraction by a decimal fraction. • Solve problems using the four operations with decimal fractions.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
	<ul style="list-style-type: none"> • Model addition and subtraction of decimal fractions. • Model multiplication and division of a decimal fraction by a whole number. • Solve problems involving decimal fractions in real life situations including money and measure. • Solve problems using equivalent fractions for tenths, hundredths, 1-place and 2-place decimal fractions. <p><u>PERCENTAGES</u></p> <ul style="list-style-type: none"> • Understand that a percentage is a fraction with a denominator of 100. • Model percentages. • Find a simple percentage of a quantity or an amount. • Select the most effective strategy to calculate a simple percentage of a given amount. <p><u>FRACTIONS, DECIMALS AND PERCENTAGES</u></p> <ul style="list-style-type: none"> • Represent simple fractions as a decimal fraction on a calculator. • Explore and justify the equivalence between simple fractions, decimal fractions and percentages. • Model the relationship between simple fractions, decimal fractions and percentages. • Choose whether to represent thinking as a fraction, decimal fraction or percentage and justify. • Solve problems using knowledge of equivalent forms of common fractions, decimal fractions and percentages. 	<ul style="list-style-type: none"> • Model the four operations with decimal fractions. • Model multiplication and division of a decimal fraction by a decimal fraction. • Use mental and written strategies for the four operations with decimal fractions. <p><u>PERCENTAGES</u></p> <ul style="list-style-type: none"> • Understand how 10% and 1% can be used to find other percentages. • Represent percentages in a variety of ways. • Read, write, compare and order percentages. • Find percentages of amounts. • Find a percentage change <p><u>FRACTIONS, DECIMALS AND PERCENTAGES</u></p> <ul style="list-style-type: none"> • Understand the relationship between fractions, decimal fractions and percentages. • Understand that a decimal fraction can be partitioned using both decimal notation and fractional notation. • Investigate the relationship between decimal notation and fractional notation. • Compare and order fractions, decimals and percentages. • Convert between fractions, decimal fractions and percentages. • Use fractions, decimal fractions and percentages interchangeably in real life situations. <p><u>RATIO AND PROPORTION</u></p> <ul style="list-style-type: none"> • Understand the difference between ratio and proportion. • Understand proportion as '1 in every x parts'. • Understand that proportion is a way of comparing parts of the quantity to the whole quantity. • Understand the difference between direct and indirect proportion. • Model, read and write ratios and proportions. • Use ratios and proportion in real life situations. • Calculate using ratios and proportion. • Reduce ratios to their simplest form. • Use equivalent ratios. • Solve problems involving direct and indirect proportion. 	<p><u>PERCENTAGES</u></p> <ul style="list-style-type: none"> • Understand how a percentage relates to a whole unit. • Understand the concept of percentage greater than 100%. • Calculate percentages in a variety of ways including using technology. • Choose the most appropriate method when calculating a percentage and justify the choice. • Use knowledge of percentages to solve problems involving percentages in context. <p><u>FRACTIONS, DECIMALS AND PERCENTAGES</u></p> <ul style="list-style-type: none"> • Understand that changing between fractions, decimals and percentages may be appropriate for the context of the problem. • Choose whether to represent thinking as a fraction, decimal fraction or percentage and justify. • Choose the most appropriate form of fractions, decimal fractions and percentages to use when making calculations mentally, in written form or using technology. • Interpret solutions to make comparisons, decisions and choices. <p><u>PROPORTION</u></p> <ul style="list-style-type: none"> • Understand the difference direct and inverse proportion. • Recognise when quantities are related in direct or inverse proportion. • Use graphical methods to illustrate direct and inverse proportion. • Use numerical methods to illustrate direct and inverse proportion. • Solve problems involving direct and inverse proportion.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Money</p>			
<p><i>I can use money to pay for items and can work out how much change I should receive.</i> <i>MNU 1-09a</i></p> <p><i>I have investigated how different combinations of coins and notes can be used to pay for goods or be given in change.</i> <i>MNU 1-09b</i></p>	<p><i>I can manage money, compare costs from different retailers, and determine what I can afford to buy.</i> <i>MNU 2-09a</i></p> <p><i>I understand the costs, benefits and risks of using bank cards to purchase goods or obtain cash and realise that budgeting is important.</i> <i>MNU 2-09b</i></p> <p><i>I can use the terms profit and loss in buying and selling activities and can make simple calculations for this.</i> <i>MNU 2-09c</i></p>	<p><i>When considering how to spend my money, I can source, compare and contrast different contracts and services, discuss their advantages and disadvantages, and explain which offer best value to me.</i> <i>MNU 3-09a</i></p> <p><i>I can budget effectively, making use of technology and other methods, to manage money and plan for future expenses.</i> <i>MNU 3-09b</i></p>	<p><i>I can discuss and illustrate the facts I need to consider when determining what I can afford, in order to manage credit and debt and lead a responsible lifestyle.</i> <i>MNU 4-09a</i></p> <p><i>I can source information on earnings and deductions and use it when making calculations to determine net income.</i> <i>MNU 4-09b</i></p> <p><i>I can research, compare and contrast a range of personal finance products and, after making calculations, explain my preferred choices.</i> <i>MNU 4-09c</i></p>
<ul style="list-style-type: none"> Understand the difference between pounds and pence e.g. difference between 2p and £2. Count and order small collections of coins and notes according to their value. Understand the various methods of paying for goods and services. Use money including coins, notes, cards and vouchers increasingly appropriately in role play situations. Read amounts of money and make up the amount with coins and note combinations in different ways. Write amounts of money and make up the amount with coins and note combinations in different ways. Count coins in multiples of 5p, 10p, 20p, 50p, £1 and £2, and record total amounts. Use different coins and note combinations to make the same amount. Be able to estimate and calculate costs and change. Decide whether or not they have more or less money than the price and whether to expect change. 	<ul style="list-style-type: none"> Compare the cost of items from different retailers. Explain why money and measures use decimal notation. Understand that monetary amounts can be written with no more than 2 decimal places. Explain the differences between 'credit', 'debit' and 'debt'. Understand the concept of debt and explain the implications. Understand that affordability is based on money available. Explain why budgeting is important. Budget given a scenario and make relevant choices based on calculations. Understand the importance of online security. Understand the benefits and risks of using bank cards. Discuss the potential impact of profit and loss on individuals, groups and organisations. Enter and read amounts of money on a calculator, rounding calculator displays to the nearest pence. Regroup money to the fewest number of notes and coins. Round prices to the nearest whole number. Solve problems involving profit and loss, with and without digital technologies. Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies. Read, interpret and use product sales information. Use a range of strategies using the four operations numbers to compare costs to 2 decimal places. Investigate and calculate 'best buys' with and without digital technologies. Give sound reasons for decisions when solving problems involving money and costs from different retailers. Create simple financial plans. 	<ul style="list-style-type: none"> Understand that planning ahead is necessary. Investigate the importance of basic living costs in order to develop an understanding of independent living. Understand the terms associated with financial products. Explain the need for financial products, services and contracts. Understand the terms 'save', 'invest' and 'borrow'. Understand the advantages and disadvantages of different financial offers. Calculate and compare different offers and choose one that offers best value, giving valid reasons for my choice. Understand there may be hidden costs when purchasing products. Understand the concept of insurance. Have an understanding of ethical trading Have an understanding of tax. Use understanding of financial services to budget effectively in a variety of scenarios. Have an understanding of Direct Debit/Standing Order. Have an understanding of National Insurance. Apply understanding of such things as: financial services, saving, borrowing, APR, pa, overspending, online spending, debit, credit and scams to make financial decisions. Use knowledge of vague, robust and misleading information to inform choices. Use knowledge of percentages to calculate interest and compare costs. Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies. Investigate foreign currency and exchange rates. Compare different currencies and convert between. 	<ul style="list-style-type: none"> Further develop understanding of tax. Further develop understanding of National Insurance. Extend application of such things as: financial services, saving, borrowing, overspending, online spending, debit, credit and scams to make financial decisions. Calculate and compare different offers and choose one that offers best value, giving valid reasons for my choice. Connect the compound interest formula to repeated applications of simple interest using appropriate digital technologies.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Time</p>			
<p><i>I can tell the time using 12 hour clocks, realising there is a link with 24 hour notation, explain how it impacts on my daily routine and ensure that I am organised and ready for events throughout my day.</i> MNU 1-10a</p> <p><i>I can use a calendar to plan and be organised for key events for myself and my class throughout the year.</i> MNU 1-10b</p> <p><i>I have begun to develop a sense of how long tasks take by measuring the time taken to complete a range of activities using a variety of timers.</i> MNU 1-10c</p>	<p><i>I can use and interpret electronic and paper-based timetables and schedules to plan events and activities, and make time calculations as part of my planning.</i> MNU 2-10a</p> <p><i>I can carry out practical tasks and investigations involving timed events and can explain which unit of time would be most appropriate to use.</i> MNU 2-10b</p> <p><i>Using simple time periods, I can give a good estimate of how long a journey should take, based on my knowledge of the link between time, speed and distance.</i> MNU 2-10c</p>	<p><i>Using simple time periods, I can work out how long a journey will take, the speed travelled at or distance covered, using my knowledge of the link between time, speed and distance.</i> MNU 3-10a</p>	<p><i>I can research, compare and contrast aspects of time and time management as they impact on me.</i> MNU 4-10a</p> <p><i>I can use the link between time, speed and distance to carry out related calculations.</i> MNU 4-10b</p>
<ul style="list-style-type: none"> • Understand the link between time and events in the day. • Understand the relationship between units of time such as hours, days and months. • Recognise different tools for measuring time such as stopwatch, calendar, clock etc. • Understand that diaries and calendars are used to record events in time. • Know the ordinal number of the months e.g. January is the 1st month. • Know key time facts and vocabulary. • Use a variety of tools to measure units of time. • Tell the time on analogue and digital clocks in hours. • Use am and pm notation when recording time. • Identify the link between 12 and 24 hour notation. • Use a calendar to identify dates and number of days in a month. • Convert units of time e.g. hours, days & months. • Record information on, and identify information from, a calendar. • Use measures of time to assist problem solving in real life. 	<ul style="list-style-type: none"> • Use a range of instruments to measure time • Tell the time on analogue and digital clocks in hours and minutes. • Read and write digital and 12 hour clocks. • Estimate and compare 12 hour and 24 hour systems. • Use straightforward timetables with both 12 hour and 24 hour notation. • Use models to make time calculations using 12 and 24 hour times. • Read time on various measuring devices and record using correct notation and common abbreviations. • Estimate and compare lengths of time • Convert between units of time e.g. seconds, minutes, years, decades & centuries. • Understand the relationship between units of time such as seconds, minutes, years, decades and centuries. • Understand the appropriateness of rounding in relation to time. • Know units of speed e.g. mph, km/h. • Know units of distance. • Experience scheduling tasks within a given time. • Give a good estimate of how long a journey should take. • Have experience of exploring a range of approaches to calculating speed, distance or time. • Calculate approximate durations. • Understand why different time zones exist. • Use reasoning to interpret and solve simple problems involving speed, distance and time where formulae are not required. • Plan an event/activity using a range of timetables and schedules. • Select and utilise the most appropriate unit of time for an activity, explaining the reason for the choice. 	<ul style="list-style-type: none"> • Convert hours and minutes to a decimal fraction and vice versa with a calculator if necessary. • Extract data when given a simple problem solving situation. • Know and understand the relationship between speed, distance and time and how this relates to units of measure - leading to the formation of rules. • Have experience of using the speed/distance/time formula. • Understand compatible units e.g. distance km and time is km/h. • Calculate a time interval. • Interpret simple distance/time graphs. • Calculate average speed, time and distance in a range of problem solving situations. • Create distance/time graphs. • Use distance/time graphs to calculate speed. • Identify the correct formula in a given situation. 	<ul style="list-style-type: none"> • Convert hours and minutes to a decimal fraction and vice versa with a calculator if necessary. • Identify and apply the correct formula in a variety of situations.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
Measurement			
<p><i>I can estimate how long or heavy an object is, or what amount it holds, using everyday things as a guide, then measure or weigh it using appropriate instruments and units.</i></p> <p style="text-align: center;"><i>MNU 1-11a</i></p> <p><i>I can estimate the area of a shape by counting squares or other methods.</i></p> <p style="text-align: center;"><i>MNU 1-11b</i></p>	<p><i>I can use my knowledge of the sizes of familiar objects or places to assist me when making an estimate of measure.</i></p> <p style="text-align: center;"><i>MNU 2-11a</i></p> <p><i>I can use the common units of measure, convert between related units of the metric system and carry out calculations when solving problems.</i></p> <p style="text-align: center;"><i>MNU 2-11b</i></p> <p><i>I can explain how different methods can be used to find the perimeter and area of a simple 2D shape or volume of a simple 3D object.</i></p> <p style="text-align: center;"><i>MNU 2-11c</i></p>	<p><i>I can solve practical problems by applying my knowledge of measure, choosing the appropriate units and degree of accuracy for the task and using a formula to calculate area or volume when required.</i></p> <p style="text-align: center;"><i>MNU 3-11a</i></p> <p><i>Having investigated different routes to a solution, I can find the area of compound 3D objects, applying my knowledge to solve practical problems.</i></p> <p style="text-align: center;"><i>MNU 3-11b</i></p>	<p><i>I can apply my knowledge and understanding of measure to everyday problems and tasks and appreciate the practical importance of accuracy when making calculations.</i></p> <p style="text-align: center;"><i>MNU 4-11a</i></p> <p>Through investigating real-life problems involving the surface area of simple 3D shapes, I can explore ways to make the most efficient use of materials and carry out the necessary calculations to solve related problems.</p> <p style="text-align: center;"><i>MTH 4-11b</i></p> <p>I have explored with others the practicalities of the use of 3D objects in everyday life and can solve problems involving the volume of a prism, using a formula to make related calculations when required.</p> <p style="text-align: center;"><i>MTH 4-11c</i></p>
<p><u>UNITS OF MEASUREMENT</u></p> <ul style="list-style-type: none"> Recognise what is meant by length, height, width, mass and capacity. Count using non-standard units so that items can be measured. Explain why non-standard units must be uniform. e.g. pencils must all be the same length. Understand that to compare there needs to be a common reference point. e.g. line up the edges of a pencil to compare length. Understand that different measurements are required for different types of objects. Investigate how standard units are all uniform. e.g. cm, m, kg etc. Understand that a calibrated scale can be used for recording standard units. Compare and order objects by focusing on a particular attribute. Compare estimates made to the accurate measurement. Use and record standard units for measuring length, height, width, mass and capacity. Read a calibrated scale to the nearest graduation. Using non-standard and standard units make objects to specific criteria. Select appropriate types of unit and measuring tools for a purpose. Measure using a given calibrated scale to the nearest graduation. <p><u>ESTIMATION</u></p> <ul style="list-style-type: none"> Understand that an estimated value is not exact. Know that measurements might not be exact and use words to describe size. Estimate and measure in real life situations using non-standard and standard units. 	<p><u>UNITS OF MEASUREMENT</u></p> <ul style="list-style-type: none"> Use appropriate vocabulary to describe dimensions of objects. Understand the terms, still used today in everyday life, from the Imperial system. Using multiple criteria, make representations to show understanding of measurement Choose an appropriate tool and unit for the most efficient measurement to solve a problem. Measure accurately using standard units. Understand that an un-numbered calibrated scale can be used for measuring more accurately. Read and interpret scales on a range of measuring devices. Use decimal and fractional notation in measurement e.g. $4\frac{1}{2}$cm, 2.63kg. Explore the relationships between units. e.g. kg, g etc. Understand the connection between decimal representations to the metric system. Convert units of measurement appropriately. Solve problems involving multiple measurement criteria. <p><u>ESTIMATION</u></p> <ul style="list-style-type: none"> Understand using the known size of familiar objects, can be used as benchmarks to help with estimation. Without any units being present, estimate length, volume, mass, weight and area. 	<p><u>UNITS OF MEASUREMENT</u></p> <ul style="list-style-type: none"> Through investigation, apply knowledge of relationships to calculate unknown measurements. Understand that smaller units of measurement will give more accurate answers. Convert between standard units up to 3 decimal places. Describe when exact measurements could be difficult to calculate. Determine and justify the level of accuracy required to solve real life problems involving measurement. Use known relationships to solve problems. <p><u>ESTIMATION</u></p> <ul style="list-style-type: none"> Without any units being present, estimate length, volume, mass, weight and area. 	<p><u>UNITS OF MEASUREMENT</u></p> <ul style="list-style-type: none"> Extend understanding that smaller units of measurement will give more accurate answers. Describe when exact measurements could be difficult to calculate. Determine and justify the level of accuracy required to solve multi-step real life problems involving measurement.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>AREA & VOLUME</p> <ul style="list-style-type: none"> Recognise what is meant by area, mass and volume. Use standard units for solving problems involving area, mass and volume Understand that objects can have equal areas even when they look different. Create and record area using a variety of non-standard units. Use standard units to calculate volume, mass and area. 	<p>AREA, PERIMETER & VOLUME</p> <ul style="list-style-type: none"> Explain the difference between perimeter and area. Understand conservation of area. Calculate area, perimeter and volume using known relationships. Create, from a given area or perimeter, a square or rectangle. 	<p>AREA, PERIMETER & VOLUME</p> <ul style="list-style-type: none"> Understand that to measure objects, part units can be amalgamated to make a unit. Understand that attributes of compound shapes/objects can be identified using knowledge of common shapes/objects. Split a compound shape/object into multiple parts in order to find the area/volume. Use liquid displacement to measure and order objects by their volume. Explain the relationships between length, depth and breadth in order to calculate area and volume and begin to link these to known formulae. Use knowledge of compound shapes/objects and formulae to solve problems involving measure. Select the appropriate formula to solve measurement problems. 	<p>AREA, PERIMETER & VOLUME</p> <ul style="list-style-type: none"> Understand that a net is made up from known common shapes/objects. Split a net into multiple parts in order to find a surface area. Know the relationships to create formulae for a surface area & volumes. Use knowledge of nets and formulae to solve problems involving surface areas. Select the appropriate formula to solve surface area and volume problems.
FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Mathematics - its impact on the world, past, present and future</p>			
<p>I have discussed the important part that numbers play in the world and explored a variety of systems that have been used by civilisations throughout history to record numbers.</p> <p>MTH 1-12a</p>	<p>I have worked with others to explore, and present our findings on, how mathematics impacts on the world and the important part it has played in advances and inventions.</p> <p>MTH 2-12a</p>	<p>I have worked with others to research a famous mathematician and the work they are known for, or investigated a mathematical topic, and have prepared and delivered a short presentation.</p> <p>MTH 3-12a</p>	<p>I have discussed the importance of mathematics in the real world, investigated the mathematical skills required for different career paths and delivered, with others, a presentation on how mathematics can be applied in the workplace.</p> <p>MTH 4-12a</p>
<ul style="list-style-type: none"> Recognise mathematical information in everyday life. Recognise the opportunities to use calculation in everyday life. Recognise the place of numeracy in the world of work. Explore number systems from history. Discuss evidence of historical number systems. Discuss the impact that numbers have on everyday life. Interpret tally marks. Compare systems and decide which is most useful. 	<ul style="list-style-type: none"> Explore an aspect of mathematics that is used to support interpretation of modern life. Explore the importance of mathematics in informing decision making. Explore the importance of mathematics in the world of work. Explore the role of mathematics in discoveries both past and present. Share findings regarding impact that mathematics has on the world. Use questioning to interrogate the findings of others Respond to questioning of others. 	<ul style="list-style-type: none"> Explore a mathematician and the work they are known for. Explore a mathematical topic of interest. Create a presentation with others regarding impact that mathematicians and/or mathematics has on the world. Use questioning to interrogate the findings of others in regard to the impact of mathematics past and present. Respond to questioning of others. 	<ul style="list-style-type: none"> Explore mathematical skills required for different careers. Explore the importance of mathematics in the real world. Explore a mathematical area of its links to within STEM Create a presentation with others and share findings with others on how mathematics can be applied in the workplace. Question others to further own knowledge about the role mathematics plays in Employability and STEM. Respond to questioning from others, sharing knowledge of research into impact that mathematics has within Employability and STEM.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Patterns and Relationships</p>			
<p>I can continue and devise more involved repeating patterns or designs, using a variety of media. MTH 1-13a</p> <p>Through exploring number patterns, I can recognise and continue simple number sequences and can explain the rule I have applied. MTH 1-13b</p>	<p>Having explored more complex number sequences, including well-known named number patterns, I can explain the rule used to generate the sequence, and apply it to extend the pattern. MTH 2-13a</p>	<p>Having explored number sequences, I can establish the set of numbers generated by a given rule and determine a rule for a given sequence, expressing it using appropriate notation. MTH 3-13a</p>	<p>Having explored how real-life situations can be modelled by number patterns, I can establish a number sequence to represent a physical or pictorial pattern, determine a general formula to describe the sequence, then use it to make evaluations and solve related problems. MTH 4-13a</p> <p>I have discussed ways to describe the slope of a line, can interpret the definition of gradient and can use it to make relevant calculations, interpreting my answer for the context of the problem. MTH 4-13b</p> <p>Having investigated the pattern of the coordinate points lying on a horizontal or vertical line, I can describe the pattern using a simple equation. MTH 4-13c</p> <p>I can use a given formula to generate points lying on a straight line, plot them to create a graphical representation then use this to answer related questions. MTH 4-13d</p>
<ul style="list-style-type: none"> Understand that patterns can be found in numbers e.g. odd and even numbers. Describe patterns with numbers including those resulting from performing the four operations. Continue patterns with numbers including those resulting from performing the four operations. Complete/continue patterns with missing parts of the sequence having identified the rule. Generate patterns with numbers including those resulting from performing the four operations 	<ul style="list-style-type: none"> Describe patterns with numbers resulting from performing more than one step. Describe patterns with fractions, decimal fractions and whole numbers resulting from addition or subtraction. Investigate, continue and generate patterns with numbers resulting from performing more than one step. Investigate, continue and generate patterns with numbers resulting from performing multiplication or division. Investigate, continue and generate patterns with fractions, decimal fractions and whole numbers resulting from addition or subtraction. Describe the rule used to generate a sequence. 	<ul style="list-style-type: none"> Understand that patterns can be generalised by a rule. Understand that patterns can be represented, analysed and generalised using tables, graphs, words and symbolic rules. Analyse pattern and function using tables, graphs, words and symbolic rules. Select appropriate methods to analyse patterns and identify rules and recognise terms. Calculate terms in a sequence, and continue a sequence, when the rule and first term are known. Construct the rule for the nth term in a sequence. Construct a rule in algebraic form from a word problem. 	<ul style="list-style-type: none"> Recognise that there are other types of sequences e.g. non-linear sequences. Understand that gradient is the measure of steepness of a slope. Describe a gradient as positive, negative, zero or undefined. Select two appropriate points on a straight line to calculate gradient. Understand how to calculate gradients by dividing the vertical distance by the horizontal distance. Understand the impact changing the scale of the x and y axes has on the appearance of the gradient. Investigate the pattern of coordinates on horizontal and vertical lines. Understand the term y-intercept Complete a table of values for a given equation. Plot points from a table and observe the connection between the gradient, the y-intercept and the equation of the line in the form $y = mx + c$. Construct formulae to find the nth term of a sequence with a constant difference between terms. Construct formulae to find the nth term of a non-linear sequence. Use nth term formulae to generate sequences. Compare two gradients to identify which is steeper. Use the equation of a line to describe a horizontal or vertical line. Identify the gradient and y-intercept from the equation of a straight line. Given the gradient and y-intercept, state the equation of the straight line. Solve real life examples involving sequences. Use knowledge of gradients to interpret distance/time graphs. Solve real life examples involving gradients and interpret the answer e.g. ramps.

			<ul style="list-style-type: none"> From an equation of a line, draw a horizontal or vertical line. Given a straight line graph, identify the gradient, y-intercept and then state the equation of the line. Draw and interpret straight line graphs to solve problems, including alternative variables.
FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.			
Expressions and Equations			
<p>I can compare, describe and show number relationships, using appropriate vocabulary and the symbols for equals, not equal to, less than and greater than. <i>MTH 1-15a</i></p> <p>When a picture or symbol is used to replace a number in a number statement, I can find its value using my knowledge of number facts and explain my thinking to others. <i>MTH 1-15b</i></p>	<p>I can apply my knowledge of number facts to solve problems where an unknown value is represented by a symbol or letter. <i>MTH 2-15a</i></p>	<p>I can collect like algebraic terms, simplify expressions and evaluate using substitution. <i>MTH 3-14a</i></p> <p>Having discussed ways to express problems or statements using mathematical language, I can construct, and use appropriate methods to solve, a range of simple equations. <i>MTH 3-15a</i></p> <p>I can create and evaluate a simple formula representing information contained in a diagram, problem or statement. <i>MTH 3-15b</i></p>	<p>Having explored the distributive law in practical contexts, I can simplify, multiply and evaluate simple algebraic terms involving a bracket. <i>MTH 4-14a</i></p> <p>I can find the factors of algebraic terms, use my understanding to identify common factors and apply this to factorise expressions. <i>MTH 4-14b</i></p> <p>Having discussed the benefits of using mathematics to model real-life situations, I can construct and solve inequalities and an extended range of equations. <i>MTH 4-15a</i></p>
<ul style="list-style-type: none"> Understand the associative and commutative properties of addition (see <i>Points to Consider</i>). Understand number relationships using vocabulary and symbols = , ≠ , < and > . Investigate a variety of numerical expressions involving such things as missing addends, subtrahends etc. Select and justify the appropriate symbol (= , ≠ , < and >) to complete a numerical expression (a number sentence) or when comparing quantities. Solve problems by using numerical expressions for the four operations. Use equivalent numerical expressions involving addition and subtraction to find unknown quantities e.g. $15 + 7 = 22 - ?$ Solve problems by using the properties and relationships of addition and subtraction. Use the symbols = , ≠ , < and > . 	<ul style="list-style-type: none"> Understand that letters or symbols can represent unknown numbers in mathematics. Explore strategies to find unknown values in appropriate algebraic expressions. Select and justify strategies to find unknown values in appropriate algebraic expressions. Solve problems using the properties and relationships of the four operations. Solve problems that require finding the value of an unknown quantity represented by a symbol or letter. 	<ul style="list-style-type: none"> Understand the term 'variable' and 'coefficient'. Understand that an expression is a combination of symbols, letters and numbers. Understand why like terms can be simplified. Understand why unlike terms can be multiplied and divided. Understand why tables are beneficial for creating formula. Deconstruct a formula to explain the meaning. Write expressions using letters instead of numbers. Create formula from a completed table. Apply BODMAS when evaluating expressions. Add and subtract like terms for increasingly complex examples Evaluate expressions substituting numbers for letters. Multiply and divide algebraic terms. Construct equations to solve word problems. Interpret diagrams and word problems to create formulae. Evaluate increasingly complex formulae. Select appropriate methods to create formulae. 	<ul style="list-style-type: none"> Model the distributive law in practical contexts e.g. $3 \times (2 + 6) = 3 \times 2 + 3 \times 6$ Recognise that the commutative law applies to algebraic terms e.g. $abc = cba$ Understand that factorising is the opposite of expanding brackets. Model balancing equations with unknowns on both sides. Understand the symbols < , > , ≤ and ≥ in relation to inequations. Investigate what effect multiplying and dividing inequations by negative numbers has on the symbol. Evaluate an expression including brackets, given a value for each variable. Use the distributive law to simplify an algebraic expression by removing or expanding the brackets. Use knowledge of common factors to identify highest common factors in algebraic expressions. Show the process of eliminating terms by using inverse operations with equations and inequations e.g. with $5x - 4 = 2x + 9$ you would add 4 to both sides to eliminate the - 4. Construct an inequation to describe a real life situation e.g. speed ≤ 40mph. Expand and simplify expressions with brackets including a negative multiplier. Factorise algebraic expressions. Solve equations/inequations with unknowns on both sides including brackets. Construct inequations and an extended range of equations to solve problems. Interpret solutions and check the answer with the original context. Solve inequations involving negative coefficients of x.

Shape, Position and Movement

FIRST LEVEL

SECOND LEVEL

THIRD LEVEL

FOURTH LEVEL

At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.

Properties of 2D Shapes and 3D Objects

<p>I have explored simple 3D objects and 2D shapes and can identify, name and describe their features using appropriate vocabulary. MTH 1-16a</p> <p>I can explore and discuss how and why different shapes fit together and create a tiling pattern with them. MTH 1-16b</p>	<p>Having explored a range of 3D objects and 2D shapes, I can use mathematical language to describe their properties, and through investigation can discuss where and why particular shapes are used in the environment. MTH 2-16a</p> <p>Through practical activities, I can show my understanding of the relationship between 3D objects and their nets. MTH 2-16b</p> <p>I can draw 2D shapes and make representations of 3D objects using an appropriate range of methods and efficient use of resources. MTH 2-16c</p>	<p>Having investigated a range of methods, I can accurately draw 2D shapes using appropriate mathematical instruments and methods. MTH 3-16a</p>	<p>I have explored the relationships that exist between the sides, or sides and angles, in right-angled triangles and can select and use an appropriate strategy to solve related problems, interpreting my answer for the context. MTH 4-16a</p> <p>Having investigated the relationships between the radius, diameter, circumference and area of a circle, I can apply my knowledge to solve related problems. MTH 4-16b</p>
<ul style="list-style-type: none"> Extend vocabulary to allow for more detailed description of 2D shapes and 3D objects. Recognise a range of 2D shapes and simple 3D objects in different orientations. Explore shapes where tiling is both possible and impossible. Sort, describe and draw 2D shapes and 3D objects. Explain which shapes will tile and which will not. Use mathematical language to describe 2D shapes and 3D objects. Understand, analyse and describe the relationships between 2D shapes and 3D objects. Create a tiling pattern. 	<ul style="list-style-type: none"> Understand the common language used to describe, and the relationships between, 2D shapes and 3D objects. Discuss the similarities and differences of properties of regular and irregular polygons. Create skeletons of simple 3D objects. Deconstruct and reconstruct 3D objects to explore their nets. Explore the place of 2D shapes and 3D objects in the environment and the arts. Sort, describe and model regular and irregular polygons. Match 3D objects to its net. Identify 2D shapes and 3D objects in the real world. Use visualisation of shape and space as a strategy for solving problems. Analyse and describe regular and irregular polygons using mathematical vocabulary. Create nets of simple 3D objects. Create skeletons of a variety of 3D objects. Explore and discuss where and why 2D shapes and 3D objects are used in the environment. 	<ul style="list-style-type: none"> Use mathematical language to describe shapes and objects. Analyse and describe regular and irregular polyhedra using mathematical vocabulary. Understand congruent or similar shapes. Explore the properties of circles. Understand that geometric ideas and relationships can be used to solve problems. Explore the construction of shapes using a range of mathematical instruments. Draw different views of prisms and solids formed from a combination of prisms. Create and model the relationship between 2D nets and 3D objects. Use a range of mathematical instruments to draw shapes. Identify, describe and model congruency and similarity in 2D shapes. Extend the use of visualisation of shape and space as a strategy for solving problems. Solve problems by accurately drawing mathematical shapes. Construct 2D nets to construct 3D models. 	<ul style="list-style-type: none"> Explores the relationship between sides of a right-angled triangle. Explores the relationship between the sides of a right-angled triangle and its angles. Explores the relationship between a circles circumference and its radius. Explores the relationship between a circles radius and its area. Uses Pythagoras' Theorem to calculate the length of the hypotenuse in a right-angled triangle. Uses Pythagoras' Theorem to calculate the length of a shorter side in a right-angled triangle. Uses the Converse of Pythagoras to prove/disprove that a triangle is right-angled. Uses trigonometry to calculate the length of a side in a right-angled triangle. Uses trigonometry to calculate the size of an angle in a right-angled triangle. Use the formula $C = 2\pi r$ or $C = \pi d$ to calculate the circumference of a circle. Use the formula $A = \pi r^2$ to calculate the area of a circle. Calculates the diameter and radius of a circle given the area or circumference. Solves real-life problems involving Pythagoras' Theorem. Solves real-life problems using trigonometry. Calculates the circumference and area of a circle in real-life problems.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Angle, Symmetry and Transformation</p>			
<p>I can describe, follow and record routes and journeys using signs, words and angles associated with direction and turning. MTH 1-17a</p> <p>I have developed an awareness of where grid reference systems are used in everyday contexts and can use them to locate and describe position. MTH 1-18a</p> <p>I have explored symmetry in my own and the wider environment and can create and recognise symmetrical pictures, patterns and shapes. MTH 1-19a</p>	<p>I have investigated angles in the environment, and can discuss, describe and classify angles using appropriate mathematical vocabulary. MTH 2-17a</p> <p>I can accurately measure and draw angles using appropriate equipment, applying my skills to problems in context. MTH 2-17b</p> <p>Through practical activities which include the use of technology, I have developed my understanding of the link between compass points and angles and can describe, follow and record directions, routes and journeys using appropriate vocabulary. MTH 2-17c</p> <p>Having investigated where, why and how scale is used and expressed, I can apply my understanding to interpret simple models, maps and plans. MTH 2-17d</p> <p>I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid. MTH 2-18a / MTH 3-18a</p> <p>I can illustrate the lines of symmetry for a range of 2D shapes and apply my understanding to create and complete symmetrical pictures and patterns. MTH 2-19a / MTH 3-19a</p>	<p>I can name angles and find their sizes using my knowledge of the properties of a range of 2D shapes and the angle properties associated with intersecting and parallel lines. MTH 3-17a</p> <p>Having investigated navigation in the world, I can apply my understanding of bearings and scale to interpret maps and plans and create accurate plans, and scale drawings of routes and journeys. MTH 3-17b</p> <p>I can apply my understanding of scale when enlarging or reducing pictures and shapes, using different methods, including technology. MTH 3-17c</p> <p>I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid. MTH 2-18a / MTH 3-18a</p> <p>I can illustrate the lines of symmetry for a range of 2D shapes and apply my understanding to create and complete symmetrical pictures and patterns. MTH 2-19a / MTH 3-19a</p>	<p>Having investigated the relationship between a radius and a tangent and explored the size of the angle in a semi-circle, I can use the facts I have established to solve related problems. MTH 4-17a</p> <p>I can apply my understanding of the properties of similar figures to solve problems involving length and area. MTH 4-17b</p> <p>I can plot and describe the position of a point on a 4-quadrant coordinate grid. MTH 4-18a</p> <p>I can apply my understanding of the 4-quadrant coordinate system to move, and describe the transformation of, a point or shape on a grid. MTH 4-18b</p> <p>Having investigated patterns in the environment, I can use appropriate mathematical vocabulary to discuss the rotational properties of shapes, pictures and patterns and can apply my understanding when completing or creating designs. MTH 4-19a</p>
<p>POSITION</p> <ul style="list-style-type: none"> Understand that language can be used to describe routes, areas and positions within the environment. Understand that directional language can be used to describe turns. Discuss journeys and routes using signs, landmarks and appropriate vocabulary. Explore the relationship between directional language and compass points. Investigate the use of grids and maps in everyday contexts. Interpret and create simple directions, describing paths and areas in the environment. Represent a journey or route by drawing. Read, find and plot grid references. Use simple directions, describing routes and areas in the environment. Interpret simple maps of familiar locations and identify relative positions. Create and interpret simple grid maps to show positions and routes. Use simple legends and directions to interpret information contained in basic maps. Continue to use technology in relation to position, direction and movement. Use simple compass points to describe direction. 	<p>POSITION</p> <ul style="list-style-type: none"> Understand that directions for locations can be represented by coordinates on a grid. Understand the relationship between the 8 point compass rose and angles of multiples of 45°. Investigate the angle between two different compass points. Use grid reference system to read, plot and locate features using coordinates. Record directions for a given route that involves some turning. Follow routes that use the directions on the 8 point compass rose. Use knowledge of coordinates and directional vocabulary in practical applications. Describe routes using landmarks and directional vocabulary. Use the 8 point compass rose to describe directions for a route. Use coordinates, grids and maps to plot and locate position. Continue to use technology in relation to position, direction and movement. 	<p>POSITION</p> <ul style="list-style-type: none"> Understand systems for describing position and direction. Explore the Cartesian coordinate system using all four quadrants. Explain the relationship between bearings and the compass rose. Identify and use language and notation of bearing to describe position and direction. Use grid reference system to read, plot and locate features using coordinates. Measure and draw 3 figure bearings. Apply language and notation of bearing to describe position and direction. Create a route on a map or model following directions based on distance, angle and compass bearings. Give directions based on distance, angle and compass bearings. 	<p>POSITION</p> <ul style="list-style-type: none"> Use a four-quadrant Cartesian grid to read and plot coordinates. Apply and identify translations and reflections of points, lines, shapes and objects on a four-quadrant grid.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p><u>SYMMETRY</u></p> <ul style="list-style-type: none"> Explore examples of symmetry and tessellation which can be found in the environment. Investigate using mirrors and folding to create symmetrical patterns and pictures. Create and describe symmetrical and tessellating patterns. Identify lines of symmetry on a range of patterns, pictures and shapes. <p><u>ANGLE</u></p> <ul style="list-style-type: none"> Recognise angles as the amount of turn between two straight lines. Explore right and straight angles in relation to turns. Identify where angles exist. Understand that angles are measured. Understand that a right angle is 90°. Estimate whether an angle is greater or less than a right or straight angle. 	<p><u>SYMMETRY</u></p> <ul style="list-style-type: none"> Recognise and explain symmetrical patterns including translation and tessellation in the environment. Describe reflections of 2D shapes. Identify lines of symmetry in 2D shapes. Create and explain symmetrical pictures and patterns with and without Digital technology. <p><u>ANGLE</u></p> <ul style="list-style-type: none"> Understand an angle as a measure of rotation. Explore acute, obtuse, right and reflex angles and how these compare to right and straight angles. Explore using a protractor to measure angles. Analyse angles by comparing and describing rotations. Identify acute, obtuse, right, straight and reflex angles and explain reasoning. Use mathematical instruments to accurately measure and draw a variety of angles, within $\pm 2^\circ$, to solve problems. Explore complementary and supplementary angles. Use knowledge of complementary and supplementary angles to calculate missing angles. <p><u>SCALE</u></p> <ul style="list-style-type: none"> Explore situations where scale is used. Use scale to support understanding of size and distance. Understand how to calculate actual size and distance. Interpret simple models, maps and plans. 	<p><u>SYMMETRY</u></p> <ul style="list-style-type: none"> Investigate translation, reflections on an axis and rotations on the Cartesian plane using coordinates. Explore line and reflective symmetry. Explore translations and reflections on an axis. Identify lines of symmetry in 2D shapes. Create and explain symmetrical pictures and patterns. <p><u>ANGLE</u></p> <ul style="list-style-type: none"> Explore corresponding, alternate and vertically opposite angles. Investigate parallel, intersecting, perpendicular and transversal lines. Demonstrate that the angle sum of a triangle is 180°. Demonstrate that the angle sum of a quadrilateral is 360°. Understand how to calculate exterior angles. Describe lines and angles using geometric vocabulary. Record angles using correct notation. Classify triangles according to their side and angle properties. Use knowledge of interior angles of a triangle to calculate angles in other 2D shapes. Calculate complementary and supplementary angles. <p><u>SCALE</u></p> <ul style="list-style-type: none"> Understand how scale (ratio) is used to enlarge and reduce shapes. Investigate angles in enlargements and reductions. Explore the use of scale to calculate actual distance. Identify the scale factor from given dimensions. Identify and use scale to enlarge and reduce shapes, including using technology. Read and interpret scale in real life contexts. Discuss considerations required when creating scale drawings and models. Use the scale factor to enlarge and reduce shapes, including using technology. 	<p><u>SYMMETRY</u></p> <ul style="list-style-type: none"> Describe rotational properties of shapes, pictures and patterns, including the order of rotation. Use knowledge of rotational symmetry to complete and create designs. Recognise all forms of symmetry in the real world. <p><u>ANGLE</u></p> <ul style="list-style-type: none"> Explore and understand the relationship between the tangent and radius in circles. Explore and understand the relationship and properties of triangles in a semi-circle. Applies knowledge of the relationship between the tangent and the radius to calculate sizes of missing angles. Applies knowledge of triangles, angles and circles, including semi-circles, to solve problems. Identify triangles created by chords within a circle and can apply to real-life contexts. <p><u>SCALE</u></p> <ul style="list-style-type: none"> Explore the differences between similar shapes and congruent shapes. Prove two shapes are similar. Use a given scale factor to enlarge or reduce any shape. Calculate a reduction or enlargement scale factor. Use similarity to find unknown lengths of 2D shapes. Use and apply area and volume scale factors to solve problems in real-life contexts.

Information Handling

At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
Data and Analysis			
<p><i>I have explored a variety of ways in which data is presented and can ask and answer questions about the information it contains.</i> MNU 1-20a</p> <p><i>I have used a range of ways to collect information and can sort it in a logical, organised and imaginative way using my own and others' criteria.</i> MNU 1-20b</p> <p>Using technology and other methods, I can display data simply, clearly and accurately by creating tables, charts and diagrams, using simple labelling and scale. MTH 1-21a</p>	<p><i>Having discussed the variety of ways and range of media used to present data, I can interpret and draw conclusions from the information displayed, recognising that the presentation may be misleading.</i> MNU 2-20a</p> <p><i>I have carried out investigations and surveys, devising and using a variety of methods to gather information and have worked with others to collate, organise and communicate the results in an appropriate way.</i> MNU 2-20b</p> <p>I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables charts, diagrams and graphs, making effective use of technology. MTH 2-21a/MTH3-21a</p>	<p><i>I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading.</i> MNU 3-20a</p> <p>When analysing information or collecting data of my own, I can use my understanding of how bias may arise and how sample size can affect precision, to ensure that the data allows for fair conclusions to be drawn. MTH 3-20b</p> <p>I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables charts, diagrams and graphs, making effective use of technology. MTH 2-21a/MTH3-21a</p>	<p><i>I can evaluate and interpret raw and graphical data using a variety of methods, comment on relationships I observe within the data and communicate my findings to others.</i> MNU 4-20a</p> <p>In order to compare numerical information in real-life contexts, I can find the mean, median, mode and range of sets of numbers, decide which type of average is most appropriate to use and discuss how using an alternative type of average could be misleading. MTH 4-20b</p> <p>I can select appropriately from a wide range of tables, charts, diagrams and graphs when displaying discrete, continuous or grouped data, clearly communicating the significant features of the data. MTH 4-21a</p>
<ul style="list-style-type: none"> Understand that, to make sense of data, it needs to be organised. Understand that reading and analysing data is an important life skill. Understand that information about themselves can be obtained in different ways. Develop mathematical vocabulary to allow for comparisons to be made e.g. 'more', 'fewer', 'less than', 'greater than'. Explore the collection and organisation of data to help make informed choices and decisions. Understand that sets can be organised by one or more attributes. Understand that information can be collected and recorded in different ways. Gather data relevant to a question. Explore different types of bar graphs, tables and diagrams. Explore graphs which have different scales. Use known methods for organising data. Collect and represent data in a variety of ways e.g. survey, practical investigation. Collect, check and classify data. Use Venn and Carroll diagrams to explore relationships between data. Identify questions or issues based on more than one categorical variable. Plan methods of data collection and recording. Collect and display data correctly from a variety of sources for the purpose of answering questions. 	<ul style="list-style-type: none"> Understand that the way data is organised and displayed can impact on its interpretation. Display information in a non-ambiguous way. Understand that not all information is equally reliable. Identify misleading presentation of data e.g. incorrect scale. Understand that information about themselves can be obtained in different ways. Select and trial methods for data collection including survey questions and recording sheets. Consider reliability of data when planning surveys. Design surveys and systematically collect and organise data in line graphs, tables and spreadsheets, including the use of technology Collect and represent data in a variety of ways e.g. survey, practical investigation. Collect, check and classify data Explore, and discuss information from, different types of graphs, tables and diagrams. Explore possible outcomes from a variety of data. Select the most appropriate graph form, scale and range to display data. Explore the purpose of databases and spreadsheets. Understand that scale can represent different quantities in graphs. Explore the difference in appearance by changing the scale and range of graphs. Identify and read range and scale on graphs. Show differing range and scale on graphs. Construct suitable data displays with and without the use of technology, from given or collected data. 	<ul style="list-style-type: none"> Understand that different types of graphs have special purposes. Understand the relevance of sample size, reliability and bias when interpreting data. Display information using bias. Choose data sources with careful consideration when conducting a survey or experiment and justify the data collection strategy. Understand that information about themselves can be obtained in different ways. Understand the importance of sample size, reliability and bias when collecting data. Discuss the difference between primary and secondary data. Identify primary and secondary sources of data. Design surveys and systematically collect and organise data in line graphs, simple pie charts, tables and spreadsheets, including the use of technology. Construct suitable data displays with and without the use of technology, from given or collected data. Set up a spreadsheet using simple formulae to manipulate data and create graphs. Create and manipulate an electronic database for their own purposes. Read and interpret information from a range of different graphs and diagrams, including describing trends. Consider sample size, primary and secondary data when conducting a survey or experiment. Understand that statistics can be shown in different pictorial ways. 	<ul style="list-style-type: none"> Explore the advantages and disadvantages of different statistical diagrams. Select the most appropriate statistical diagram to display a given data set, for example, stem and leaf. Justifies the most appropriate statistical diagram to display a given data set. Makes valid comparisons between two or more sets of data and comment appropriately on the information displayed. Explores the differences between different types of data (discrete and continuous). Uses different types of charts to display discrete, continuous and grouped data appropriately. Interprets raw and graphical data. Uses statistical language, for example, correlations, to describe identified relationships. Draw lines of best fit onto scatter graphs to investigate correlations between variables. Use the terms positive/direct correlation and negative/indirect correlation. Calculates the mean, median, mode and range of a data set. Understands and explains why using an alternative type of average could be misleading. Interpret charts to find the mean, median, mode and range.

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<ul style="list-style-type: none"> Sort, organise and present data in a logical way, including with the use of technology. Create displays of data using lists, pictographs, bar graphs and simple line graphs with and without the use of technology. Interpret data for the purpose of answering questions. Interpret data by comparing quantities on pictographs or bar graphs. 		<ul style="list-style-type: none"> Understand the terms 'vague', 'robust' and 'misleading'. Analyse graphs and diagrams to state whether statements made about the data are true or misleading. 	
FIRST LEVEL	SECOND LEVEL	THIRD LEVEL	FOURTH LEVEL
<p>At all stages, learners should be given experiences to develop reasoning and problem solving. Learners should be given opportunities to explain their thinking using appropriate mathematical vocabulary. They should be given opportunities to investigate mathematical concepts in relevant contexts. Learners must have opportunities to BUILD understanding, REPRESENT understanding and APPLY understanding.</p>			
<p>Ideas of Chance and Uncertainty</p>			
<p><i>I can use appropriate vocabulary to describe the likelihood of events occurring, using the knowledge and experiences of myself and others to guide me.</i> <i>MNU 1-22a</i></p>	<p><i>I can conduct simple experiments involving chance and communicate my predictions and findings using the vocabulary of probability.</i> <i>MNU 2-22a</i></p>	<p><i>I can find the probability of a simple event happening and explain why the consequences of the event, as well as its probability, should be considered when making choices.</i> <i>MNU 3-22a</i></p>	<p><i>By applying my understanding of probability, I can determine how many times I expect an event to occur, and use this information to make predictions, risk assessment, informed choices and decisions.</i> <i>MNU 4-22a</i></p>
<ul style="list-style-type: none"> Explore and discuss the possibility of events happening in their daily lives. Develop vocabulary to allow for description of likelihood e.g. 'impossible', 'probably', 'maybe', 'certain', 'less/more likely'. Have an awareness of the reasonableness of an outcome. Discuss fairness and luck. Describe the possible outcomes using appropriate language. Identify and describe chance in daily events. Use information to determine possible outcomes. Be able to justify simple choices and decisions. 	<ul style="list-style-type: none"> Understand that certainty includes those events that must happen and those that cannot happen. Continue to develop appropriate vocabulary relating to certainty and impossibility e.g. 'unlikely', 'likely', 'very likely/unlikely'. Use a simple probability scale to show the chance of an event happening. List all possibilities for straightforward situations. Construct repeated simple experiments and use counting to determine which event is more likely. Use probability to determine what would be mathematically fair/unfair and to explain possible outcomes. Express probability using mathematical language e.g. equal chance, one in three. Analyse and explain results of simple experiments. 	<ul style="list-style-type: none"> Understand that probability can be expressed in scale (0-1) or per cent (0% - 100%). Explore the difference between experimental and theoretical probability. Explore the link between the greater number of trials and the increase in the reliability of this as an indicator of likelihood. Investigate different ways of calculating probability. Express probability as a simple fraction, decimal fraction using scale (0 - 1) or as a per cent (0% - 100%). Calculate the probability of an event happening or not happening. Calculate an expected outcome from a given probability. Identify all the possible outcomes for two or three-stage situations e.g. rolling two dice or tossing three coins. Express probability using simple fractions. Take non-numerical factors into account when making decisions. Use appropriate ways of calculating probability. 	<ul style="list-style-type: none"> Identifies and knows the difference between independent and dependent events. Explores, compares and discusses the differences between theoretical and experimental probabilities. Calculates the probability of independent and dependent events. Calculates both theoretical and experimental probabilities and can explain why there may be a difference between these. Calculates the probability and determines the expected occurrence of an event. Applies knowledge of skills in calculating probability to make predictions. Uses two-way tables to calculate probabilities of events.