**Numeracy and Mathematics Progression Pathways**

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**Introduction**

From the beginning of the 2016/2017 session, a **‘draft’** Progression Pathway was introduced to schools to support staff in developing their understanding of progression within the Numeracy and Mathematics Experiences and Outcomes. This was designed by triangulating the information from the National Numeracy and Mathematics Progression Framework, Experience and Outcomes from Curriculum for Excellence and the **‘draft’** Benchmarks for Numeracy and Mathematics.

Throughout the 2016/2017 session numeracy leaders and practitioners across the authority were given the opportunity to provide feedback. In line with the ‘**final’** Benchmarks which were published in June 2017, small changes have been made throughout.

The Pathway is designed to support the learning and teaching of Numeracy and Mathematics and should complement previous developments completed by many schools across the authority. It should not replace your current planning documents if you do not wish it too. However, schools wishing to continue using their current planners will benefit from moderating their content in line with the Numeracy and Mathematics Progression to ensure consistency across the authority.

I hope that the content of the progression supports your teaching of Numeracy and Mathematics.

**Lynne McBain**

Attainment Challenge Team

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| **Curriculum**  **Organisers** | **Experiences and Outcomes** | **Early Level Numeracy and Mathematics**  Learning Steps Progression | | | | |
| **Estimation and rounding** | *I am developing a sense of size and amount by observing, exploring, using and communicating with others about things in the world around me.*  ***MNU 0-01*** | * I can, without counting, recognise regular domino/dice dot patterns * I have had experience of estimating/guessing ‘How many …..’ | | * I can, without counting, recognise the number of objects in a group up to 6 * I understand and use the language of estimation, e.g. less than, more than, same, longer than * I can check estimate by counting | | |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *I have explored numbers, understanding that they represent quantities, and I can use them to count, create sequences and describe order.*  ***MNU 0-02a***  *I use practical materials and can ‘count on and back’ to help me to understand addition and subtraction, recording my ideas and solutions in different ways.*  ***MNU 0-03a*** | **Number Word Sequences**   * I can say forward number word sequences to 20 * I can say backward number word sequences from 10 * I can continue the forward number word sequence from any given number (0 – 20) * I can continue the backward number word sequence from any given number (0 -10)   **Numerals (to at least 10)**   * I can read numeral sequences * I can identify numerals * I can recognise numerals * I can sequence numerals * I can work out missing numerals on a numeral track   **Number Structure (to 5)**   * I can make finger patterns to 5 looking at my fingers * I can make finger patterns to 5 without looking at my fingers * I can identify ‘how many’ in regular dot patterns, without having to count, e.g. five frames, dice, dominoes | | **Number Word Sequences**   * I can say forward number word sequences from 0 - 30 * I can say backward number word sequences from 20 * I can continue the forward number word sequence from any given number (0 – 30) * I can continue the backward number word sequence from any given number (0 - 20) * I am beginning to recall number word after and number word before * I can say the next 2, 3, 4 numbers in a number word sequence   **Numerals (to at least 20)**   * I can identify numerals * I can recognise numerals * I can sequence numerals * I can order numerals * I can work out missing numerals on a numeral track * I can count on/back from a numeral to find/locate a numeral on a blank numeral track * I can use ordinal language in real-life contexts, e.g. first, second, third   **Number Structure**   * I can make double finger patterns 1 to 5, e.g. show 2 and 2 and state that 2 and 2 makes 4 * I can **make** finger patterns to 10 in different ways * I can **throw** finger patterns to 10 in different ways * I can identify ‘how many’ in regular dot patterns, without having to count, e.g. ten frames * I can partition quantities to 10 into two or more parts, e.g. 6 can be made from 5 and 1, 2 and 4, 2 and 2 and 2 etc | | |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *I have explored numbers, understanding that they represent quantities, and I can use them to count, create sequences and describe order.*  ***MNU 0-02a***  *I use practical materials and can ‘count on and back’ to help me to understand addition and subtraction, recording my ideas and solutions in different ways.*  ***MNU 0-03a*** | **Addition and Subtraction**   * I can demonstrate one-to-one correspondence to count items in one collection (up to 10) * I can count out a requested number of items (up to 10) * I can count items in two collections (within 10) * I can recognise that the appearance of the group has no effect on the total number * I understand that the number name of the last object counted is the name given to the total number in the group   **Multiplication and Division**   * I have had experience of describing, organising and making equal groups * I have had experience of sharing and grouping | | **Addition and Subtraction**   * I can demonstrate one-to-one correspondence to count items in one collection (up to 20) * I can count on to add * I can count back to subtract * I can mentally double numbers to a total of 10 * I can mentally add within 10 * I can mentally subtract within 10 * I can solve simple missing number problems within 10 * I can use +, - and = to form and solve a number sentence   **Multiplication and Division**   * I can describe, organise and make equal groups * I can describe, organise and partition equal shares | | |
| **Fractions, decimal fractions and percentages** | *I can share out a group of items by making smaller groups and can split a whole object into smaller parts.*  ***MNU 0-07a*** | * I have experienced sharing and grouping within a relevant context | | * I can share concrete objects equally within relevant contexts * I can group items into smaller sets of a given size * I can solve equal sharing problems (in at least halves) with answers that are mixed numbers and fractions less than 1, e.g. share 5 chocolate bars between 2 children * I can use concrete materials to investigate breaking a whole into parts (at least in halves) * I understand that for the parts to be equal they must be the same size * I can use appropriate vocabulary to describe halves | | |
| **Money** | *I am developing my awareness of how money is used and can recognise and use a range of coins.*  ***MNU 0-09a*** | * I have had experience of handling money and understand where it is used in everyday life | | * I can recognise and name all coins * I can count out amounts to 10 using 1p coins * I can work out total cost to at least 10p, using a variety of coins * I am beginning to work out change from 10p | | |
| **Time** | *I am aware of how routines and events in my world link with times and seasons, and have explored ways to record and display these using clocks, calendars and other methods.*  ***MNU 0-10a*** | * I can recall/discuss order of events * I can use before and after to place events in correct sequence * I can place personal events in time sequence | | * I know the sequence of the days of the week * I know the months of the year * I can talk about the seasons * I have engaged with everyday devices used to measure time * I can tell ‘on the hour’ times displayed on analogue and digital clocks * I can use appropriate language to discuss time using before, after, o’clock, hour hand and minute hand | | |
| **Measurement** | *I have experimented with everyday items as units of measure to investigate and compare sizes and amounts in my environment, sharing my findings with others.*  ***MNU 0-11a*** | **Length**   * I have experienced using non-standard units to measure length * I have experienced comparing length * I am beginning to use the language of - long, short, shorter, longer, taller   **Weight**   * I have experienced using non-standard units to measure weight * I have experienced comparing 2 weights by hand/scales * I am beginning to use the language of weight, e.g. heavy, light, heavier, lighter   **Volume**   * I have experienced measuring volume using non-standard units * I am beginning to use the language of full and empty when describing volume | | **Length**   * I can use non-standard units to estimate and measure length * I can order more than 2 lengths from shortest to longest or vice-versa * I can use the language long, short, shorter, longer, taller   **Area**   * I can use non-standard units to measure the area of a variety of sizes and shapes   **Weight**   * I can use non-standard units to estimate and measure weight * I can order more than 2 weights * I can use the language heavy, heavier, heaviest, light, lighter, lightest   **Volume**   * I can use non-standard units to estimate and measure volume * I can order identical containers with most volume to least or least to most * I can use the language full, empty, more, less when discussing volume | | |
| **Patterns and relationships** | *I have spotted and explored patterns in my own and the wider environment and can copy and continue these and create my own patterns.*  ***MTH 0-13a*** | * I recognise simple patterns in the environment * I can create simple patterns using objects and shapes * I can copy simple patterns involving objects, shapes and numbers | | * I can create simple number patterns * I can continue simple patterns using objects and shapes, e.g. * I can continue simple number patterns, e.g. 8, 9, 10, \_\_\_, \_\_\_\_, \_\_\_\_ or 18, 17, 16, 15, \_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ | | |
| **Expressions and equations** |  | * I am beginning to solve simple word problems using practical materials | | * I can solve simple word problems using practical materials * I am beginning to translate a word problem into a number sentence * I can use +,- and = to form and solve a number sentence | | |
| **Properties of 2D shapes and 3D objects** | *I enjoy investigating objects and shapes and can sort, describe and be creative with them.*  ***MTH 0-16a*** | **2D Shape**   * I can sort 2D shapes * I can recognise simple 2D shapes in the environment   **3D Objects**   * I have had experience of building with 3D objects * I can sort 3D objects | | **2D Shapes**   * I can name simple 2D shapes, e.g. triangle, circle, square, rectangle * I can talk about the properties of simple 2D shapes using appropriate vocabulary e.g. edges, vertices, curved, straight   **3D Objects**   * I can recognise simple 3D objects in the environment * I can talk about the properties of simple 3D objects using appropriate vocabulary e.g. flat, round | | |
| **Angle, symmetry and transformation** | *In movement, games, and using technology I can use simple directions and describe positions.*  ***MTH 0-17a***  *I have had fun creating a range of symmetrical pictures and patterns using a range of media.*  ***MTH 0-19a*** | **Angle**   * I am beginning to use simple directions to describe positions, e.g. behind, in front of, above, below   **Transformation**   * I can use language of position to describe where objects are, e.g. forwards, backwards | | **Angle**   * I can use simple directions to describe positions, e.g. behind, in front of, above, below   **Symmetry**   * I understand what symmetrical means and can identify pictures with one line of symmetry * I can create symmetrical pictures with one line of symmetry   **Transformation**   * I can use the language of direction to describe and direct in real life contexts, e.g. forwards, backwards, left, right | | |
| **Data and analysis** | *I can collect objects and ask questions to gather information, organising and displaying my findings in different ways.*  ***MNU 0-20a***  *I can match objects, and sort using my own and others’ criteria, sharing my ideas with others.*  ***MNU 0-20b***  *I can use the signs and charts around me for information, helping me plan and make choices and decisions in my daily life.*  ***MNU 0-20c*** | * I can sort objects into different categories using criteria/own criteria | | * I can display data in a variety of different ways, e.g. tally chart, pictograph * I can interpret a simple tally chart or pictograph * I can ask and answer questions about specific presented information | | |
| **Curriculum**  **Organisers** | **Experiences and Outcomes** | **First Level Numeracy and Mathematics**  Learning Steps Progression | | | | |
| **Estimation and rounding** | *I can share ideas with others to develop ways of estimating the answer to a calculation or problem, work out the actual answer, and then check my solution by comparing it with the estimate.*  ***MNU 1-01a*** | * I can estimate the position of any number up to 100 on a number line with decades clearly marked * I can check a solution by comparing with the estimate | * I can explain the rule for rounding up and down * I can round to the nearest ten * I can estimate answers to 2-digit sums using rounding and compare with the solution | | | * I can estimate the position of any number up to 100 on a number line/square * I understand and can round to the nearest 100 * I can estimate answers to 3-digit sums using rounding and compare with the solution, e.g. 478 + 211 = 500 + 200 = 700 |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *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.*  ***MNU 1-02a*** | **Number Word Sequences (to at least 100)**   * I can say forward number word sequences, starting from any number * I can say backward number word sequences, starting from any number * I can quickly recall number word after and number word before * I can say the next 2, 3, 4 numbers in a number word sequence * I can count number of jumps from a to b, e.g. If I start at 38 how many jumps to get to 45? * I can count in tens on the decade, e.g. 40, 50, 60, 70   **Numerals (to at least 100)**   * I can identify numerals * I can recognise numerals * I can sequence numerals * I can order numerals * I can work out missing numerals on a numeral track * I can work out missing numerals on a hundred square * I can count on/back to find/locate a given numeral on a hundred square   **Number Structure**   * I can build and describe numbers to 20; * using doubles and near doubles * using ten * by partitioning through ten * using commutative relationships of number | **Number Word Sequences**   * I can say the forward number word sequences in multiples of 2s, 10s, 5s within 100 * I can say the backward number word sequences in multiples of 2s, 10s, 5s within 100 * I can say the next number word before and after in a multiple number sequence in 2s, 10s and 5s * I can count on and back in 10s/1s on and off the decade * I am beginning to say the forward/backward number word sequences in multiples of 3s and 4s   **Numerals (to at least 1000)**   * I can identify and recognise multiples of 100 * I can sequence and order multiples of 100 * I can identify and recognise decade numerals * I can sequence and order decade numerals * I can identify and recognise 3-digit numerals * I can work out missing numerals on a numeral track   **Number Structure**   * I can build and describe the value of numbers to 100 using 10s and 1s * I am showing an increasing understanding of zero as a placeholder | | | **Number Word Sequences**   * I can say the forward number word sequences in multiples of 2s, 10s, 5s from any whole number up to 1000 * I can say the backward number word sequences in multiples of 2s, 10s, 5s from any whole number up to 1000 * I can say the forward number word sequences in multiples of 3s and 4s * I can increment in 100s, 10s and 1s on and off the hundred and decade * I can decrement in 100s, 10s and 1s on and off the hundred and decade   **Numerals**   * I can sequence and order 3-digit numerals * I can work out missing numerals on a numeral track * I am beginning to work with whole numbers to at least 10 000   **Number Structure**   * I can build and describe the value of numbers to at least 1000 using 100s, 10s and 1s * I can demonstrate an understanding of zero as a place holder |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *I can use addition, subtraction, multiplication and division when solving problems, making best use of the mental strategies and written skills I have developed*.  ***MNU 1-03a*** | **Addition and Subtraction**   * I can recall doubles to at least 20 * I can recall near doubles within 20 * I can describe how I solve a variety of addition and subtraction tasks to 20; * using my knowledge of doubles and near doubles * by partitioning through ten * using compensation strategies * using my knowledge of commutativity * using my knowledge of inverse operations   **Multiplication and Division**   * I can use practical materials to combine and count equal groups to calculate how many altogether, e.g. how many altogether if I have 3 groups of six? * I can use practical materials to partition a collection equally and count the number of groups or number in each group, e.g. If I have 12 sweets and share them equally between 3 children how many sweets would they get each? * I can describe, build and count simple arrays (no more than 50 in total) | **Addition and Subtraction**   * I can describe how I use my knowledge of number structures to; * add from a decade number, e.g. 30 + 5 * subtract to a decade number, e.g. 35 – 5 * add to a decade number, e.g. 35 + 5 * subtract from a decade number, e.g. 30 – 5 * add through a decade number, e.g. 38 + 5 * subtract through a decade number, e.g. 43 – 5 * I can solve 2-digit addition problems mentally with no bridging (65 + 30, 43 + 25) * I can solve 2-digit subtraction problems mentally with no bridging (92 – 40, 68 – 25)   **Multiplication and Division**   * I can build, describe and count arrays * I can use practical materials/pictorial representations to calculate the total of equal groups, e.g. 3 groups of 4 * I can use practical materials/pictorial representations to calculate the number of groups or number in each group when a collection is shared equally, e.g. 15 shared between 3 * I can use counting strategies to multiply a single digit by 2, 5 and 10, e.g. 5 x 4 = \_\_\_ * I can use counting strategies to divide by 2, 5 and 10, e.g. 18 ÷ 2 = \_\_\_ * I can multiply 2-digit numbers by 10 * I can divide multiples of 10/100 by 10 * I am beginning to multiply multiples of ten up to fifty by 2 and 5, e.g. 40 x 2, 50 x 5 * I am beginning to use counting strategies to multiply a single digit by 3, 4 * I am beginning to use counting strategies to divide by 3, 4 * I have explored and engaged in solving 2 step word problems | | | **Addition and Subtraction**   * I can describe how I solve a variety of higher decade addition and subtraction tasks using my knowledge of tens and ones, e.g. 45 + 47, 63 – 28 * I can mentally add and subtract within 100 and explain my strategies * I can add and subtract multiples of 10, 100 to or from whole numbers to 1000 * I am beginning to use a range of non-count-by-one mental strategies to solve tasks within 1000 * I can begin to use the written algorithm to solve addition and subtraction calculations involving 3-digit numbers or more   **Multiplication and Division**   * I can use counting strategies to multiply a single digit by 2, 3, 4, 5 and 10 * I can mentally multiply and divide whole numbers by 10 and 100 (whole number answers only) * I can multiply multiples of 10 by 2, 3, 4 and 5 * I can multiply a 2-digit number by 2, 3, 4 or 5, e.g. 43 x 5 = (40 x 5) + (3 x 5) = 200 + 15 = 215 * I can solve problems involving multiplication and division (including with remainders) and can share my strategies * I can begin to use the written algorithm to solve multiplication and division calculations involving 3-digit numbers or more (no remainders) * I can solve 2 step word problems |
| **Fractions, decimal fractions and percentages** | *Having explored fractions by taking part in practical activities, I can show my understanding of:*   * *how a single item can be shared equally* * *the notation and vocabulary associated with fractions* * *where simple fractions lie on the number line.*   ***MNU 1-07a***  *Through exploring how groups of items can be shared equally, I can find a fraction of an amount by applying my knowledge of division.*  ***MNU 1-07b***  *Through taking part in practical activities including use of pictorial representations, I can demonstrate my understanding of simple fractions which are equivalent.*  ***MTH 1-07c*** | * I can solve equal sharing problems (in quarters) with answers that are mixed numbers and fractions less than 1, e.g. share 5 cakes between 4 children * I can use concrete materials and pictorial representations to investigate breaking a whole into parts (quarters) * I can work out halves of numbers up to 20 and begin to recall them | * I can solve equal sharing problems (in thirds and fifths) with answers that are mixed numbers and fractions less than 1, e.g. share 5 cakes between 4 children * I can use concrete materials and pictorial representations to investigate breaking a whole into parts (thirds and fifths) * I can recognise simple fractional notation, in word and mathematical form * I have explored, through real-life practical situations, the concept of the greater the number of parts, the smaller the size of each part, e.g. cakes, pizzas, chocolate bars * I understand and can demonstrate how a whole is represented, e.g. 3 thirds = 1 whole, 4 quarters = 1 whole | | | * I can use concrete materials to investigate breaking a whole into parts * I can solve equal sharing problems with answers that are mixed numbers and fractions less than, e.g. share 13 cakes between 6 people * I can identify where simple fractions lie on an empty number line * I understand the relationship between division/simple fractions and can find fractions of whole numbers * I have explored simple equivalences * I can recognise and use simple fractional notation, in word and mathematical form * I can explain the role of the numerator and denominator * I have an awareness of how to record fractions as decimal fractions (tenths) |
| **Money** | *I can use money to pay for items and can work out how much change I should receive.*  ***MNU 1-09a***  *I have investigated how different combinations of coins and notes can be used to pay for goods or be given in change.*  ***MNU 1-09b*** | * I can order coins from the least in value to the most * I can use 1p, 2p, 5p, 10p and 20p coins to pay for items up to 50p * I can work out change up to 20p | * I can make use of mental strategies to find the total cost of items up to £1 * I can make use of mental strategies to calculate change up to £1 * I can use different combinations of coins and notes, up to at least £10, to make the same amounts of money | | | * I can use different combinations of coins and notes to make the same amounts of money, up to at least £20 * I know the role of £ and p signs and the need for two decimal places in written amounts of money * I can use rounding to estimate totals * I can calculate total cost and change involving £s and p, up to at least £10 * I can convert from pounds and pence to pence and vice-versa * I can discuss the different ways goods can be paid for |
| **Time** | *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.*  ***MNU 1-10a***    *I can use a calendar to plan and be organised for key events for myself and my class throughout the year.*  ***MNU 1-10b***  *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.*  ***MNU 1-10c*** | * I can tell the time using half past and quarter past using analogue and digital clocks * I can use a variety of timers to understand the length of a minute * I am beginning to sequence the months of the year | * I can tell the time using quarter to on analogue clocks * I can calculate durations in whole hours * I can read a simple 12hr timetable * I can record 12-hour time in am and pm * I can calculate durations in whole hours * I can sequence the months of the year and am beginning to state the number of days in each month * I know there are 24 hours in a day, 60 minutes in an hour and 60 secs in a minute | | | * I can tell the time using quarter to on digital clocks * I can calculate durations in half hour intervals * I can identify 24-hour notation and begin to make the link between the 24hr and 12hr clock * I can use and apply my knowledge of the calendar to work out durations and plan events * I can record dates in a variety of formats * I can express time in a variety of formats * I know the number of weeks and days in a year |
| **Measurement** | *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.*  ***MNU 1-11a***    *I can estimate the area of a shape by counting squares or other methods.*  ***MNU 1-11b*** | **Length**   * I can estimate whether an object is longer or shorter than 1m * I can measure and estimate in metres * I can estimate whether an object is longer or shorter than ½m * I can measure and estimate in ½ metres   **Area**   * I know that area is the amount of surface space covered by a shape * I can find and draw the area of a shape by counting squares * I can compare areas that are the same shape   **Weight**   * I can estimate whether an object is lighter or heavier than 1kg * I can measure and estimate using kilograms * I can read the weight of an object on a set of scales (kg graduations only)   **Volume**   * I can estimate whether a container holds more or less than 1 litre * I can measure and estimate using litres * I can read the volume of a container (litre graduations only) | **Length**   * I can measure and estimate using cm * I know there are 100cm in 1m * I can convert whole m to cm, e.g. 5m = 500cm * I can measure in ¼ metres   **Area**   * I can use square grids to estimate then measure the areas of a variety of simple 2D shapes to at least the nearest half square * I can create shapes with a given area to at least the nearest half square   **Weight**   * I can estimate whether an object is lighter or heavier than ½kg * I can measure and estimate using ½kg * I can read the weight of an object on a set of scales (½kg graduations)   **Volume**   * I can estimate whether a container holds more or less than ½ litre * I can measure and estimate using ½litres * I can read the volume of a container (½ litre graduations) | | | **Length**   * I can measure and estimate using mm * I can record the measurement of length to the nearest standard unit, e.g. mm, cm or m * I can make simple conversions, e.g. 1m 67cm = 167cm * I can estimate, compare and order lengths of objects using cm and m * I can read scales accurately organised in simple graduations   **Area**   * I can create different shapes of the same area * I recognise that different shapes can have the same area   **Weight**   * I can estimate and measure in grams * I know 1000g is 1kg and 500g is ½ kg * I can record the measurement of weight to the nearest standard unit, e.g. g or kg * I can make simple conversions, e.g. 3½ kg = 3500g * I can estimate, compare and order the weight of objects using g and kg * I can read scales accurately organised in simple graduations   **Volume**   * I can estimate and measure in ml * I know 1000ml is 1 litre and 500ml is ½ litres * I can record the measurement of volume to the nearest standard unit, e.g. ml or l * I can make simple conversions, e.g. 7½l = 7500ml * I can estimate, compare and order the volume of containers using ml and l * I can read scales accurately organised in simple graduations |
| **Mathematics – its impact on the world, past, present and future** | *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.*  ***MTH 1-12a*** | * I can describe a variety of ways in which I have used number in real life | * I have investigated some number systems which have been used by civilisations throughout history to record numbers | | | * I can share my understanding of a system that has been used by civilisations throughout history to record numbers, for example Early Humans, Egyptians, Roman Numerals |
| **Patterns and Relationships** | *I can continue and devise more involved repeating patterns or designs, using a variety of media.*  ***MTH 1-13a***  *Through exploring number patterns, I can recognise and continue simple number sequences and can explain the rule I have applied.*  ***MTH 1-13b*** | * I can recognise and continue odd and even number sequences * I can continue and create repeating patterns involving shapes, pictures and symbols, e.g. * I can find number patterns using addition and subtraction using practical resources and number lines | * I can describe and continue patterns in simple number sequences, e.g. in the multiplication tables * I can double numbers to continue a given number sequence | | | * I can recognise and continue number sequences up to 1000 * I can describe patterns in number using my knowledge of some multiplication tables * I can half numbers to continue a given number sequence * I can recognise, continue and explain the rule for simple number sequences |
| **Expressions and Equations** | *I can compare, describe and show number relationships, using appropriate vocabulary and the symbols for equals, not equal to, less than and greater than.*  ***MTH 1-15a***  *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.*  ***MTH 1-15b*** | * I can use numbers and symbols to record the counting tasks I have solved * I can interpret written calculations and explain what I would have to do to solve it * I can find the missing numbers in number sentences when symbols are used, using numbers to at least 20 * I can create a number statement using symbols for <, >, = within numbers to at least 20 * I can make pictures or diagrams for ‘equals’ and ‘not equal to’ * I can demonstrate my understanding of the equal sign as a balance | * I can translate a word problem into a number sentence * I can find the missing numbers in number sentences when symbols are used, using numbers to at least 100 * I can use a simple function machine for addition and subtraction operations * I can create a number statement using <, >, = within numbers to 100 * I can create a number statement using ‘not equal to’ * I can apply my understanding of the equals sign as a balance to solve simple algebraic problems where a picture is used to represent a number | | | * I can find the missing numbers in number sentences when symbols are used, using numbers to at least 1000 * I can use a simple function machine for all numerical operations (+, −, ×, ÷) * I can create a number statement using <, >, = and ‘not equal to’ ≠ with numbers to 1000 * I can apply my understanding of the equals sign as a balance to solve simple algebraic problems where a picture or symbol is used to represent a number |
| **Properties of 2D shapes and 3D objects** | *I have explored simple 3D objects and 2D shapes and can identify, name and describe their features using appropriate vocabulary.*  ***MTH 1-16a***  *I can explore and discuss how and why different shapes fit together and create a tiling pattern with them.*  ***MTH 1-16b*** | **2D Shapes**   * I know the properties of common 2D shapes, e.g. edges and vertices * I have extended my understanding of 2D shapes to be able to name pentagons, hexagons and octagons   **3D Objects**   * I can recognise and name simple 3D objects * I can recognise the properties of 3D objects, e.g. vertices, faces and edges | **2D Shapes**   * I know the properties of pentagons, hexagons and octagons, e.g. edges and vertices   **3D Objects**   * I can name 3D objects, e.g. cube, cuboid, cone, sphere, cylinder, triangular prism, square-based pyramid * I can recognise 3D objects from 2D drawings | | | **2D Shapes**   * I have developed my understanding of the properties of shape through tiling and tessellation * I can identify 2D shapes within 3D objects * I have explored simple quadrilaterals e.g. kite, rhombus, trapezium   **3D Objects**   * I can state the properties of common 3D objects |
| **Angle, symmetry and transformation** | *I can describe, follow and record routes and journeys using signs, words and angles associated with direction and turning.*  ***MTH 1-17a***  *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***  *I have explored symmetry in my own and the wider environment and can create and recognise symmetrical pictures, patterns and shapes.*  ***MTH 1-19a*** | **Angle**   * I am aware of the purpose of a compass and can discuss where and when they can be used   **Symmetry**   * I can recognise symmetrical patterns and shapes in the environment * I can complete a basic shape/picture, with one line of symmetry, to make it symmetrical   **Transformation**   * I can use the language of direction to describe and direct, e.g. left, right, forwards, backwards | **Angle**   * I have explored 90° angle sizes using right angled testers * I can identify right angles in the environment and well-known 2D shapes * I know and can use the compass points, North, South, East and West * I can follow and give directions using the 4 compass points * I know and can demonstrate how to turn a quarter, half and full turn, clockwise and anti-clockwise   **Symmetry**   * I can identify shapes, pictures, patterns with more than one line of symmetry   **Transformation**   * I understand the purpose of a grid and can use references to describe positions on the grid | | | **Angle**   * I know that a 90° turn is equivalent to a quarter turn * I can relate the names of the 4 compass points to the appropriate angles. * I can give and understand directions for turning through angles including full turn, half turn, quarter turn, clockwise, anticlockwise, right turn, left turn, right angle   **Symmetry**   * I can create pictures and designs with more than one line of symmetry   **Transformation**   * I can create a grid and give instruction of how to describe or find a position on the grid |
| **Data Analysis** | *I have explored a variety of ways in which data is presented and can ask and answer questions about the information it contains.*  ***MNU 1-20a***    *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.*  ***MNU 1-20b***  *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*** | * I can conduct a simple survey, for example using a questionnaire with yes or no answers * I can use tally marks to represent quantity and total them at the end * I can complete a bar graph using information given * I can ask and answer questions about specific presented information and use this to inform choices and decisions, e.g. pictograph * I can interpret information and ask questions about data presented in bar graphs and use this to inform choices and decisions | * I know and can select the most effective way to gather data for a particular purpose * I can conduct a survey involving four options or choices * I can create simple tables and charts to sort and organise data * I can construct a bar graph which has a title, two axes labelled and bars evenly spaced where one unit represents one value * I can, with assistance, create a bar graph using digital technologies * I can interpret information and ask questions about data presented in tables and charts and use this to inform choices and decisions | | | * I can independently select and use the most appropriate way to gather data * I can sort and organise data into graphs, tables and charts * I can use a variety of different methods, including technologies, to display gathered data, e.g. bar graphs, tables, Carroll diagrams, Venn diagrams * I can construct a bar graph which has a title, two axes labelled and bars evenly spaced where one unit represents more than one data value * I can extract information from a table or a chart * I can ask and answer questions about data presented and use this to inform choices and decisions |
| **Ideas of Chance and Uncertainty** | *I can use appropriate vocabulary to describe the likelihood of events occurring, using the knowledge and experiences of myself and others to guide me.*  ***MNU 1-22a*** | * I am beginning to use appropriate vocabulary when describing the likelihood of events occurring, such as, might happen, might not happen, likely/unlikely, certain | * I can discuss events using vocabulary that includes the terms certain, probable, unlikely/likely, possible/impossible etc. to describe outcomes | | | * I can use the terms certain/uncertain, probable, likely/unlikely, possible/impossible, fair/unfair to predict the outcome of a scenario, e.g. If you pick a counter from a bag of 10 blue counters what is the probability of it being red? * I can interpret data gathered to make predictions |
| **Curriculum Organisers** | **Experiences and Outcomes** | **Second Level Numeracy and Mathematics**  Learning Steps Progression | | | | |
| **Estimation and rounding** | *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.*  ***MNU 2-01a*** | * I understand and can round to the nearest 100 * I understand and can round to the nearest 1000 | * I can round any whole number to the nearest 10, 100, 1000 * I can estimate answers to 4-digit sums using rounding and compare with the solution * I can round a decimal fraction to the nearest whole number | | | * I can round whole numbers to any nearest graduation * I can round decimals fractions to at least 2 decimal places * I can apply a range of rounding techniques in context |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *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.*  ***MNU 2-02a***  *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.*  ***MNU 2-03a***  *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.*  ***MNU 2-04a*** | **Number Word Sequences**   * I can say the forward number word sequences in multiples * I can say the backwards number word sequences in multiples   **Numerals (whole numbers to at least**  **1 000 000)**   * I can identify numerals * I can recognise numerals * I can sequence numerals * I can order numerals * I can work out missing numerals on a numeral track   **Numerals (negative numbers)**   * I can show my understanding, through practical contexts, of how the number line extends to include numbers less than zero   **Numerals (decimal fractions to at least 1dp)**   * I am beginning to work with decimal fractions as another way of recording fractions * I can identify and read decimal fractions * I can recognise decimal fractions * I can sequence decimal fractions * I can order decimal fractions | **Number Word Sequences**   * I can confidently count forwards and backward from any number * I can increment and decrement in 1s, 10s and 100s and 1000s from any given number   **Numerals (negative numbers)**   * I can place positive and negative numbers on an empty number line * I can sequence numbers less than zero * I can order numbers less than zero * I can locate numbers less than zero on a number line   **Numerals (decimal fractions to 3dp)**   * I can identify and read decimal fractions * I can recognise decimal fractions * I can sequence decimal fractions * I can order decimal fractions * I can work out missing numerals on a numeral track | | | **Number Word Sequences**   * I can increment and decrement using a wide range of numbers   **Numerals**   * I can work confidently with whole numbers, integers and decimal fractions |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *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.*  ***MNU 2-03a***  *I have explored the contexts in which problems involving decimal fractions occur and can solve related problems using a variety of methods..*  ***MNU 2-03b***  *Having explored the need for rules for the order of operations in number calculations, I can apply them correctly when solving simple problems.*  ***MNU 2-03c***  *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.*  ***MNU 2-04a*** | **Number Structure**   * I can describe the value of each digit in a whole number * I can partition a wide range of whole numbers * I can describe the value of each digit in a decimal fraction, to at least 1 decimal place * I can partition decimal fractions, to at least 1 decimal place   **Addition and Subtraction**   * I can use my understanding of number structures to solve a range of mental addition and subtraction tasks within 1000 * I can use a range of strategies to add/subtract decimal fractions (tenths) * I can use both mental strategies and algorithms to solve a variety of addition and subtraction tasks * I can choose and justify the most efficient method for the problem give   **Multiplication and Division**   * I can use counting strategies to multiply a single digit by a single digit, up to 10x10 * I can multiply and divide whole numbers and decimal fractions (up to I decimal place) by 10, 100 and 1000 * I can multiply a multiple of ten by a single digit, e.g. 6x60 * I can calculate multiples of 10 by multiples of 100, e.g. 40 x 300 * I can multiply a 2-digit number by a single digit using the grid/split methods e.g. 56 x 6 = (50 x 6) + (6 x 6) = 300 +36 = 336 * I can mentally multiply a 2-digit number by 2, 3, 4 or 5 * I can divide a 2-digit number by a single digit (including remainder) * I can mentally x/÷ decimal fractions (tenths) by a single digit – no bridging * I am developing written strategies for x/÷ | **Number Structure (decimal fractions to 3dp)**   * I can describe the value of each digit in a decimal fraction to 3 decimal places * I can partition decimal fractions, to 3 decimal places * I can apply my knowledge of tenths, hundredths and thousandths to writing fractions and percentages   **Addition and Subtraction**   * I can use my understanding of number structures to solve a range of mental addition and subtraction tasks beyond 1000 * I can add and subtract multiples of 1 000 to whole numbers * I can use a range of strategies to add/subtract decimal fractions * I can use both mental strategies and algorithms to solve a variety of addition and subtraction tasks * I can choose and justify the most efficient method for the problem given   **Multiplication and Division**   * I am continuing to work on developing quick and accurate recall of x/÷ facts * I can multiply and divide decimal fractions by at least 10 and 100, e.g. 4.5 x 100 or 34.2 ÷ 10 * I can multiply 2-digit whole numbers by multiples of ten, for example 25 × 70 * I can divide up to 3-digit numbers by multiples of ten, for example 360 ÷ 30 * I can mentally x/÷ decimal fractions (tenths) by a single digit, e.g. 3.5 x 4 or 13.2 ÷ 4 * I can mentally divide a 3-digit number, with no remainders, by a single digit, e.g. 639 ÷ 3 = 213 * I can multiply decimal fractions by a single digit using the written algorithm * I can divide whole numbers and decimal fractions by a single digit using the written algorithm * I can use my knowledge of doubling and halving to mentally solve x and ÷ problems * I can use both mental strategies and written algorithms * I can choose the most efficient method for the problem given | | | **Number Structure**   * I can relate knowledge of number structures to any whole number or decimal fraction   **Addition and Subtraction**   * I can evaluate a task, select the most effective strategy and solve a wide range of addition and subtraction tasks * I can add and subtract multiples of 10, 100 and 1 000 to whole numbers and decimal fractions * I have explored adding and subtracting integers within context, e.g. thermometers   **Multiplication and Division**   * I can multiply and divide whole numbers and decimal fractions by 10, 100 and 1000 * I can multiply whole numbers and decimal fractions by multiples of 10, e.g. 4.56 x 30, 17.36 x 500 * I can apply multiplication strategies, including written methods to multiply numbers of more than 2 digits * I can divide whole numbers and decimal fractions by a single digit, to give an answer expressed as a decimal fraction * I can apply the correct order of operations in number calculations |
| **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*** | * I understand what a multiple of a number is and how to generate a sequence of multiples * I understand what a factor of a number is * I can find some of the factors of a given whole number | * I can use known relationships between multiplication and division to find multiples and factor pairs for a given whole number * I can find all the factors of any whole number | | | * I can apply my knowledge and understanding of multiples and factors to solve related problems in number, money and measurement |
| **Fractions, decimal fractions and percentages** | *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.*  ***MNU 2-07a***    *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.*  ***MNU 2-07b***    *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.*  ***MTH 2-07c*** | * I can compare and order simple fractions * I can describe and record simple equivalences orally, in writing and through practical enquiry * I can convert between basic improper fractions and mixed numbers, e.g. 3/2 = 1½. 5/4 = 1¼ * I can find a fraction of an amount, e.g. 1/8 of 64 * I can identify where simple decimal fractions lie on a number line * I can convert fractions (tenths, hundredths) into decimal fractions | * I can work with thousandths * I can compare and order fractions using knowledge of equivalence * I can simplify basic fractions * I can find fractions of an amount, e.g. 2/3 of 12, 7/9 of 72 * I can convert between improper fractions and mixed numbers * I can convert fractions into decimal fractions and percentages, e.g. ½ = 0.5 = 50% * I can apply understanding of the relationship between fractions, decimal fractions and percentages * I can use mental and written methods to find simple percentages of quantities, e.g. 25% of £16 or 50% of £24 | | | * I can calculate equivalences and simplify fractions fully * I can add and subtract proper fractions with the same denominator * I can work out any % of an amount using my knowledge of percentages e.g. 57% = 50%+5%+1%+1%. * I can solve real life and relevant problems using simple fractions, decimal fractions and percentages * I can multiply a whole number by a fraction * I have explored ratio by comparing different quantities, e.g. 5 red balls to 2 green balls has a ratio of 5:2 |
| **Money** | *I can manage money, compare costs from different retailers, and determine what I can afford to buy.*  ***MNU 2-09a***  *I understand the costs, benefits and risks of using bank cards to purchase goods or obtain cash and realise that budgeting is important.*  ***MNU 2-09b***  *I can use the terms profit and loss in buying and selling activities and can make simple calculations for this.*  ***MNU 2-09c*** | * I can investigate and use effective mental strategies to carry out calculations involving money * I can select appropriate strategies to solve simple money problems | * I can select appropriate strategies to solve money problems * I can compare costs from different retailers for products or services * I can interpret sales information from different retailers * I can compare costs to determine what is affordable within a given spend * I understand the costs, benefits and risks of bank cards * I understand the importance of budgeting | | | * I can budget own personal spending for an event or given scenario * I understand the terms profit and loss in real life contexts * I understand and can discuss some of the advantages and disadvantages of using a debit/credit card * I can use appropriate calculations to work out profit and loss in buying and selling activities * I can select appropriate strategies to solve money problems |
| **Time** | *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.*  ***MNU 2-10a***    *I can carry out practical tasks and investigations involving timed events and can explain which unit of time would be most appropriate to use.*  ***MNU 2-10b***    *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.*  ***MNU 2-10c*** | * I can tell the time in 5-minute intervals using both analogue and digital clocks * I can calculate time durations in 5-minute intervals * I can tell the time in minutes to and past using both analogue and digital clocks * I can convert between 12-hour and 24-hour time * I can use 24hr clock to show and read times | * I can use and interpret a range of paper and electronic timetables set out in both 12 and 24-hour clock times * I can calculate start time, end time or duration from a range of electronic and paper-based timetables and calendars * I can calculate simple time durations of activities in hours and minutes, e.g. 4:35pm to 5:52pm * I can convert commonly used units of time, e.g. 1½ hours into minutes (90) or hours and minutes (1hr and 30mins) * I know that a decade is 10 years * I know that a century is 100 years * I know that a millennium is 1000 years | | | * I can calculate durations in hours and minutes including bridging across several hours, e.g. 5:52pm to 9:23pm * I can change minutes to seconds, hours to minutes and vice-versa * I can select and justify the most appropriate unit of time for a given task, including hundredths of a second * I can solve more complex time problems by using and applying skills previously learned * I can convert times into common units, e.g. 90 minutes = 1∙5 hours * I have investigated common units and different ways that time/speed can be measured against each other * I can estimate the duration of a journey using my knowledge of speed, distance and time |
| **Measurement** | *I can use my knowledge of the sizes of familiar objects or places to assist me when making an estimate of measure.*  ***MNU 2-11a***  *I can use the common units of measure, convert between related units of the metric system and carry out calculations when solving problems.*  ***MNU 2-11b***    *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.*  ***MNU 2-11c*** | **Length**   * I can accurately measure and estimate the length, width and height of objects using the appropriate tools and units * I can estimate the length of familiar objects by comparing them to another object   **Perimeter**   * I know perimeter is the distance around the outside * I can calculate accurately the perimeter of regular shapes using mm/cm or m   **Area**   * I can measure the area of regular shapes using cm² * I can measure the area of regular shapes using ½ cm²   **Weight**   * I know that ¼ kg = 250g * I can estimate and weigh objects using a variety of gram weights * I can read scales accurately using kg and g * I can estimate the weight of familiar objects by comparing them to another object   **Volume**   * I know and convert 250ml to ¼ litre * I can measure and estimate using ¼ litre (250ml) * I can investigate and measure the volume of a range of containers using water * I can read scales accurately using l and ml * I can estimate the volume of familiar objects by comparing them to another object | **Length**   * I can convert m to cm and cm to m * I can convert cm to mm and mm to cm * I can convert m to km and km to m * I can read scales on measuring devices calculating unmarked intervals   **Perimeter**   * I can calculate accurately the perimeter of irregular shapes using mm, cm or m   **Area**   * I can calculate the area of squares and rectangles using the formula A = l x b * I can draw squares and rectangles accurately with a given area * I can measure larger areas using m²   **Weight**   * I can choose the appropriate unit of measure when estimating the weight of objects * I can convert kg to g and vice-versa * I can order weights written in different units * I can read scales on measuring devices calculating unmarked intervals   **Volume**   * I can convert l to ml and vice-versa * I can read scales on measuring devices calculating unmarked intervals * I can use cubes to measure containers * I can measure & estimate using cm cubed (cm3) * I can convert cm3 to ml * I know that capacity is maximum volume | | | **Length**   * I have shown an awareness of imperial units of length * I can select appropriate units of length when solving problems * I can record measurement of length in a variety of ways using decimal notation up to 3 places, e.g. 5567mm = 5.567m   **Perimeter**   * I can draw shapes accurately with a given perimeter * I can calculate the perimeter using a word formula * I can draw different shapes with the same perimeter   **Area**   * I can calculate the area of right angled triangles by using the formula * I have explored the relationship between the hectare and km² * I can draw different shapes with the same area   **Weight**   * I have shown an awareness of imperial units of weight * I can select appropriate units of weight when solving problems * I can record measurement of weight in a variety of ways using decimal notation up to 3 places, e.g. 1507g = 1.507kg   **Volume**   * I have shown an awareness of imperial units of volume * I can record measurement of weight in a variety of ways using decimal notation up to 3 places, e.g. 8507ml = 8.507l * I can convert cm³ to ml to l * I can calculate volume of cubes and cuboids using V=lbh |
| **Mathematics – its impact on the world, past, present and future** | *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.*  ***MTH 2-12a*** | * I have researched historical number systems and how they have changed over time | * I have researched and presented examples of the impact mathematics has in the world of life and work | | | * I have researched and contributed to discussions and activities on the role of mathematics in the creation of important inventions, now and in the past |
| **Patterns and Relationships** | *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*** | * I can continue a sequence using a rule explained in words, for example starting at 3 and add 4 * I can describe a simple sequence using words * I can write the rule to a simple sequence * I can find a missing number in a simple sequence | * I can describe more complex sequences using words * I can write the rule to more complex sequence * I can find a missing number in a complex sequence | | | * I can identify a pattern in a sequence/table and generate a rule to extend it * I can investigate and understand common sequences, for example Fibonacci, square numbers, triangular numbers * I can apply knowledge of multiples, factors, square numbers and triangular numbers to generate number patterns for others to continue |
| **Expressions and Equations** | *I can apply my knowledge of number facts to solve problems where an unknown value is represented by a symbol or letter.*  ***MTH 2-15a*** | * I can calculate the missing numbers in more complex statements where symbols are used for unknown numbers or operators * I can create equations to keep track of the sequence of steps required to solve a problem when necessary * I can use function machines forward and reverse using addition and subtraction | * I am beginning to use substitution * I am beginning to use letters to express a rule as a formula * I can use function machines forward and reverse, including two or more operations | | | * I can substitute positive values into formulae * I can solve simple equations with variables on one side of the equal sign involving very simple single or double operations, e.g. x-4=7 or 2n+3=9 * I can begin to solve simple in-equations, e.g. x-4>7 * I can use letters to express a rule as a formula * I can use function machines forward and reverse, using all operations |
| **Properties of 2D shapes and 3D objects** | *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***  *Through practical activities, I can show my understanding of the relationship between 3D objects and their nets.*  ***MTH 2-16b***  *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*** | **2D Shapes**   * I can name and identify properties of right angled and equilateral triangles * I can name and classify a range of 2D shapes and describe their properties using appropriate vocabulary including face, edge, vertex and angle * I understand that a regular polygon is equiangular (all angles are equal in measure) and equilateral (all sides have the same length)   **3D Objects**   * I can identify a 3D object from a net | **2D Shapes**   * I can name and identify properties of right-angled, isosceles, equilateral and scalene triangles * I have extended my knowledge of 2D shapes through links to symmetry, angles, parallel lines, diagonals etc. * I can use information provided about the properties of 2D shapes and use digital technologies/mathematical instruments to accurately draw these   **3D Objects**   * I can create a net for a 3D object * I have extended the range of 3D objects that I can work with and name, e.g. hexagonal prism, dodecahedron * I have extended my knowledge of properties of 3D objects | | | **2D Shapes**   * I can use the vocabulary radius, diameter and circumference when talking about circles * I know that the radius is half the diameter and can use this knowledge to draw circles using a pair of compasses * I continue to extend my knowledge of 2D shapes through links to symmetry, angles, parallel lines, diagonals etc.   **3D Objects**   * I can use digital technologies and mathematical instruments to make representations of 3D objects |
| **Angle, symmetry and transformation** | *I have investigated angles in the environment, and can discuss, describe and classify angles using appropriate mathematical vocabulary.*  ***MTH 2-17a***  *I can accurately measure and draw angles using appropriate equipment, applying my skills to problems in context.*  ***MTH 2-17b***  *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***  *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***  *I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid.*  ***MTH 2-18a***  *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*** | **Angles**   * I know a right angle is 90°, a straight line is 180° and a full turn is 360° * I know the criteria for and can identify acute, obtuse, straight and reflex angles * I can name the 8 compass points * I can follow and give directions involving the 8 compass points   **Symmetry**   * I can identify lines of symmetry of irregular shapes drawn on squared grids   **Transformation**   * I can use grid references to read, plot and record locations on a grid * I can create shapes on a co-ordinate grid | **Angles**   * I can name angles using 3 capital letters * I can draw and measure angles to within a 2-degree accuracy * I know the three figure bearings for the eight compass points * I can draw any bearing up to 180°   **Symmetry**   * I can identify and draw up to 4 lines of symmetry   **Transformation**   * I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid | | | **Angles**   * I can measure and draw 3 figure compass bearings * I know that complementary angles add up to 90 degrees and supplementary angles add up to 180 degrees and can use this knowledge to calculate missing angles * I can construct and draw angles using a ruler and a protractor * I can use my knowledge of angles to solve problems * I can use standard notation to record any 3-figure bearing, for example 060°   **Symmetry**   * I can complete and create symmetrical shapes and pictures and patterns with vertical, horizontal and diagonal lines of symmetry   **Scale**   * I can interpret and use a scale on a basic drawing |
| **Data Analysis** | *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.*  ***MNU 2-20a***  *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.*  ***MNU 2-20b***  *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*** | * I can independently collect, organise, display and interpret information using bar graphs, tables and charts * I can analyse and draw conclusions from information presented in simple tables and bar graphs to show awareness of significance of the data * I can use a simple data base to extract information * I can create a bar graph using digital technologies | * I can independently collect, organise, display and interpret information using bar, frequency and line graphs * I can select appropriate questions and formats for a survey to gather information required * I can create a simple data base * I can create a line graph and spread sheet using digital technologies | | | * I can independently collect, organise, display and interpret information using a range of graphs, tables and pie charts (pre-sectioned) * I can choose a suitable scale when displaying information * I know how methods of collecting information may affect the data collected and can discuss the reliability of the data presented * I can display data appropriately, making effective use of technology |
| **Ideas of Chance and Uncertainty** | *I can conduct simple experiments involving chance and communicate my predictions and findings using the vocabulary of probability.*  ***MNU 2-22a*** | * I can use appropriate vocabulary such as highly likely/unlikely etc., to describe the probability of an outcome/event * I can assign a numerical value to the likelihood of the occurrence of simple events on a 5 - point scale * I understand that probability can be represented by a fraction * I understand the concept of equally likely events – ‘equal chance’ * I can list all the possible outcomes of simple events using tree diagrams and organised lists | * I can investigate probability, through experimenting with tossing a coin, rolling a die etc. * I can identify 1 as certain and 0 as impossible on the number line * I can place events on a number line to demonstrate simple probabilities, for example the probability of tossing a coin and it landing heads up is 0∙5 * I can arrange events in order to determine which is most or least likely to occur * I understand that probability can be represented by a ratio; one in two, one in three and use the notation 1 : 6 | | | * I can use data to predict the outcome of a simple experiment and explain the reasoning behind the prediction * I understand that the more you carry out an experiment, the more confident you can become in predicting the result * I can use a number line from 0 to 1, where 0 is impossible and 1 is certain, to investigate and describe probability * I can place events on a number line to demonstrate the probability of any event * I am aware of how implications of chance are used in daily routines, decision making and the media |
| **Curriculum Organisers** | **Experiences and Outcomes** | **Third Level Numeracy and Mathematics**  Learning Steps Progression | | | | |
| **Estimation and Rounding** | *I can round a number using an appropriate degree of accuracy, having taken into account the context of the problem.*  ***MNU 3-01a*** | * I can round decimal fractions to 3 decimal places * I can use rounding to estimate answers * I can use my knowledge of estimation to solve problems. * I can show my knowledge of estimation to explain my choice of strategy. | | | * I can apply my knowledge of rounding to solve problems * I use the context of the problem to decide on a suitable degree of accuracy | |
| **Number and number processes**  including addition, subtraction, multiplication, division and negative numbers | *I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions.*  ***MNU 3-03a***  *I can continue to recall number facts quickly and use them accurately when making calculations.*  ***MNU 3-03b***  *I can use my understanding of numbers less than zero to solve simple problems in context.*  ***MNU 3-04a*** | **Addition and Subtraction**   * I can solve addition and subtraction problems in familiar contexts with whole numbers and decimal fractions to 3 decimal places and show my working * I can use quick methods to carry out mental calculations * I can add and subtract integers * I can justify strategies used to solve problems   **Multiplication and Division**   * I can quickly recall number facts to the 10th multiplication table * I can use multiplication and division facts to the 12th multiplication table * I can solve written multiplication and division problems in familiar contexts working with whole numbers and decimal fractions to three decimal places * I can multiply and divide integers * I can use the order of operations (BOMDAS/BODMAS) to solve basic calculations | | | **Addition and Subtraction**   * I can solve written addition and subtraction problems using integers * I can justify strategies used to solve problems   **Multiplication and Division**   * I can multiply a decimal fraction by a decimal fraction * I can divide any whole number by a decimal number * I can solve written multiplication and division problems using integers * I can justify strategies used to solve problems * I can use brackets to make an expression correct | |
| **Multiples, factors and primes** | *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***  *I can apply my understanding of factors to investigate and identify when a number is prime.*  ***MTH 3-05b*** | * I can identify common factors for whole numbers and can explain method used * I can identify prime numbers up to 100 | | | * I can solve problems relating to multiples, lowest common multiple and highest common factors * I can solve problems relating to prime numbers and explain my method used * I can express a number as a product of primes | |
| **Powers and Roots** | *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*** | * I have explored and can use the language and notation of 'powers' and 'roots' | | | * I can explain the notation and use associated vocabulary appropriately, e.g. index, exponent and power * I can evaluate simple whole number powers, e.g. 2³ = 8 * I can express whole numbers as powers, e.g. 27 = 3³ | |
| **Fractions, decimal fractions and percentages** | *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.*  ***MNU 3-07a***  *By applying my knowledge of equivalent fractions and common multiples, I can add and subtract commonly used fractions.*  ***MTH 3-07b***    *Having used practical, pictorial and written methods to develop my understanding, I can convert between whole or mixed numbers and fractions.*  ***MTH 3-07c***  *I can show how quantities that are related can be increased or decreased proportionally and apply this to solve problems in everyday contexts.*  ***MNU 3-08a*** | * I can use knowledge of fractions, decimal fractions and percentages to carry out calculations with and without a calculator * I can convert any fraction, decimal fraction or percentage into an equivalent fraction, decimal fraction or percentage * I can add and subtract commonly used fractions when changing a denominator * I can simplify any given ratio * Given a ratio, I can determine a missing quantity, knowing the other, e.g. juniors : seniors = 2 : 5. If there are 40 junior members, how many seniors are there? | | | * I can solve problems with a wide range of fractions, decimal fractions and percentages including finding a fraction or percentage of a quantity with and without a calculator * I can convert between whole or mixed numbers, improper fractions and decimal fractions * I can use direct proportion to solve problems * I can increase and decrease quantities proportionally, e.g. percentage increase/decrease * I can use ratio to solve problems | |
| **Money** | *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.*  ***MNU 3-09a***  *I can budget effectively, making use of technology and other methods, to manage money and plan for future expenses.*  ***MNU 3-09b*** | * I can use the internet and other sources to find goods and services, compare them and discuss the best value, giving reasons why * I have demonstrated an understanding of best value in relation to contracts and services when comparing products * I can use technology and other methods to keep a budget for an event e.g. planning a holiday, designing a new bedroom * I can calculate simple interest and percentage reductions * I can convert between different currencies | | | * I can consider 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 have investigated the effects of interest and percentage rates in the context of contracts and services. * I can plan personal spending and budget in a responsible way including planning for future spending * I can begin to calculate different salary rates, bonuses, wage rises and use percentages to work out commission due | |
| **Time** | *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.*  ***MNU 3-10a*** | * I can apply knowledge of the relationship between speed, distance and time to find each of the variables, using whole units of time only * I can calculate time durations across hours and days | | | * I can change hours and minutes into decimal times * I can change decimal times into hours and minutes * I can begin solve TDS problems involving half hour/ quarter hour times | |
| **Measurement** | *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.*  ***MNU 3-11a***  *Having investigated different routes to a solution, I can find the area of compound 2D shapes and the volume of compound 3D objects, applying my knowledge to solve practical problems.*  ***MTH 3-11b*** | **Length**   * I can convert between standard units to at least 3 decimal places * I can choose appropriate units of length when solving problems * I ensure the units are consistent across the problem by converting between metric units   **Area**   * I can calculate the area of a 2D shape where the units are inconsistent * I can find the area of compound 2D shapes composing of squares, rectangles and right-angled triangles * I can convert between standard units to at least 3 decimal places * I can choose appropriate units of area when solving problems * I ensure the units are consistent across the problem by converting between metric units   **Weight**   * I can convert between standard units to at least 3 decimal places * I can choose appropriate units of weight when solving problems * I ensure the units are consistent across the problem by converting between metric units   **Volume**   * I can calculate the volume of a 3D object where the units are inconsistent * I can convert between standard units to at least 3 decimal places * I can choose appropriate units of volume when solving problems * I ensure the units are consistent across the problem by converting between metric units | | | **Area**   * I can calculate the area of triangles * I can find the area of compound 2D shapes composing of squares, rectangles and triangles with consistent and inconsistent units of measure   **Volume**   * I can calculate the volume of compound 3D objects composed of cubes and cuboids with consistent and inconsistent units of measure | |
| **Mathematics –**  **its impact on the world, past, present and future** | *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.*  ***MTH 3-12a*** | * I can choose and research famous mathematicians and the work they were known for, and share this research with others, for example Archimedes, Pythagoras, Hypatia, Leibniz, Newton, Gauss, Mandelbrot * I can choose and research a mathematical topic with others and present my findings | | | | |
| **Patterns and relationships** | *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*** | * I can generate number sequences from a given rule * I can extend a given pattern in tabular form | | | * I can use a rule for a sequence to calculate the value of any given element in the pattern * I can extend a given pattern and describe the rule * I can use algebraic notation to express the rule for a given sequence | |
| **Expressions and equations** | *I can collect like algebraic terms, simplify expressions and evaluate using substitution.*  ***MTH 3-14a***  *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.*  ***MTH 3-15a***  *I can create and evaluate a simple formula representing information contained in a diagram, problem or statement.*  ***MTH 3-15b*** | * I can collect like terms to simplify an expression for adding and multiplying terms * I can use brackets in basic equations * I can substitute to evaluate expressions and formulae for positive and negative values * I can create an expression to represent a situation and simplify it by collecting like terms | | | * I can collect like terms including squared/squared root terms to simplify any algebraic expression * I can construct and then solve a range of linear equations using an appropriate method. * I can solve equations with brackets * I can create a simple formula representing information contained in a diagram, problem or statement * I can solve inequalities of the form ax + b > c | |
| **Properties of 2D shapes and 3D objects** | *Having investigated a range of methods, I can accurately draw 2D shapes using appropriate mathematical instruments and methods.*  ***MTH 3-16a*** | * I can construct a triangle given 2 sides and 1 angle * I can construct a triangle given 1 side and 2 angles * I can use a compass to construct a triangle with 3 sides given | | | * I can use a ruler, compass & protractor to draw 2D shapes accurately * I can use the formulae r = ½d and d = 2r when calculating the radius and diameter and can use this as an accurate method of drawing a circle | |
| **Angle, symmetry and transformation** | *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***  *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***  *I can apply my understanding of scale when enlarging or reducing pictures and shapes, using different methods, including technology.*  ***MTH 3-17c***  *I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid.*  ***MTH 3-18a***    *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 3-19a*** | **Angles**   * I know that the sum of the three angles in a triangle =180°; angles round a point add to 360° and angles making up a straight angle add to 180° * I can calculate a missing angle round a point * I can find missing angles using vertically opposite angles * I can find a missing angle in a triangle * I can measure bearings on a map or plan * I can draw bearings onto a map or plan to plot a route or journey   **Symmetry**   * I can identify all lines of symmetry and create symmetrical patterns and pictures   **Scale**   * I can enlarge or reduce the size of a shape * I can calculate the real length of an object from a scale drawing | | | **Angles**   * I understand vertically opposite angles, corresponding angles and alternate angles and can use these to find missing angles   **Scale**   * I can create a scale map or plan and record routes or journeys with bearings and distances * I can calculate bearings and distances from a scale map or plan | |
| **Data and analysis** | *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.*  ***MNU 3-20a***  *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***  *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 / MTH 3-21a*** | * I can source information/collect data making use of digital technology where appropriate * I can display data in the most appropriate manner * I can interpret and use more complex spreadsheets & databases * I can construct and interpret pie charts * I can interpret and do calculations using a TDS graph * I can describe the trend in data * I can justify the sample size for my data collection and explain how bias may arise | | | * I can source information/collect data making use of digital technology where appropriate * I can carry out an unbiased survey and analyse the results * I can organise and display data in the form of a scatter graph * I can interpret and construct a stem & leaf diagram * I understand and can describe distribution and trends * I can show direct proportion as a linear graph * I can analyse data and draw appropriate conclusions * I can determine if data is robust, vague or misleading | |
| **Ideas of chance and uncertainty** | *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.*  ***MNU 3-22a*** | * I can use experiments and practical activities to make links between the frequency of an event occurring and the probability of the event occurring * I can calculate the probability of a simple event happening/not happening * I can express probability in ratio form * I can express probability as a fraction, decimal fraction or percentage | | | * I can identify all of the mutually exclusive outcomes of a single event and calculate the probability of each * I can investigate real-life situations which involve making decisions on the likelihood of events occurring and the consequences involved | |