Numeracy & Maths Experiences & Outcomes Progression: Second Level

Please read guidance before using these progression sheets

Topic/Outcome/Resources	Progression		
Estimating 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*	Understand what rounding means. Estimate position of numbers up to 1000 on a number line. Round 3 digit numbers to nearest 10, 100. Use rounded numbers to estimate. Introduce rounding/estimation within money, volume, weight, length.	Estimate position of numbers on number line including one place decimals. Round 4 digit numbers to nearest 10, 100, 1000 Round one place decimals to the nearest whole number Round/estimate within money, volume, weight, length	Estimate position of numbers with 2 decimal places. Round 5-6 digit numbers to nearest 1000/10000/100000. Round any number to one decimal place. Round/estimate within money, volume, weight, length.
Number and number processes *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*	Read, write and verbalise 5 digit numbers including simple decimals to two places (money/calculator)	Read, write and verbalise up to a million including decimals to two places (link to money) Equivalence between decimals and fractions in applications involving money and measurement.	Read, write and verbalise numbers including decimals up to three places (link to measure)

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Addition *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.* *MNU2-03b*	Addition involving up to 4 digit numbers Introduce addition of decimals to at least one place Add money up to £20 Mental addition Written method of addition Calculators Practical applications Problem solving	Addition of 4 digit numbers Add decimals of any number of decimal places Add money beyond £20 Mental addition Written method of addition Calculators Practical applications Problem solving	Addition beyond 4 digit numbers. Add decimals of varying decimal places Add larger amounts of money (approximate & round) Mental addition Written method of addition Calculators Practical applications Problem solving

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Subtraction *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*	Subtraction involving up to 4 digit numbers Introduce subtraction of decimals to at least one place Subtract money up to £20 Mental subtraction Written method of subtraction Calculators Practical applications Problem solving	Subtraction of 4 digit numbers Subtract decimals of any number of decimal places Subtract money beyond £20 Mental subtraction Written method of subtraction Calculators Practical applications Problem solving	Subtraction beyond 4 digit numbers and positive and negative numbers (eg temperature & banking) Subtract decimals of varying decimal places (2-1.06) Subtract larger amounts of money (approximate & round) Mental subtraction Written method of subtraction Calculators Practical applications Problem solving

Topic/Outcome/Resources	Progression		
Multiplication *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*	Multiply at least 2 digit numbers within 2 - 10 times table and 100 Doubles of numbers to 100 Multiples of 10 and 100 Mental multiplication Written method of multiplication Calculators Practical applications Problem solving	Multiply 3-4 digit numbers within 2-10 times table and 100 Multiples of numbers 100 to 1000 Introduce multiplication of a 2 digit whole number by 2 digits Multiply decimals by a single digit whole number Multiply money by a single digit whole number Mental multiplication Written method of multiplication Calculators Practical applications Problem solving	Multiply a 4 digit whole number by a single digit whole number Multiples of numbers 100 to at least 1000 Multiplication of up to a 4 digit whole number by at least 2 digits Multiply decimals by a single digit, 100 and multiple of 10 Consolidate multiplication of money by a single digit whole number Mental multiplication Written method of multiplication Calculators Practical applications Problem solving

Topic/Outcome/Resources	Progression		
Division *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*	Divide at least 2 digit numbers within 2 - 10 times table including remainders Mental division Written method of division Calculators Practical applications Problem solving	Divide 3-4 digit numbers within 2-10 times table and 100, 1000 including remainders Divide decimals by a single digit whole number Divide money by a single digit whole number Mental division Written method of division Calculators Practical applications Problem solving	Divide at least a 4 digit whole number by a two digit whole number including remainders Division of decimals by a single digit, 10, 100, 1000 Consolidate division of money by a single digit whole number Mental division Written method of division Calculators Practical applications Problem solving
Number and number processes *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*	3+7- 4=6 3 X 8 ÷ 2 = 12	5 + (6 ÷ 2) =5 + 3 =8	8 ÷ 2 + 10 X 3 =4 + 30 =34
Negative numbers *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*	Read and record from thermometer	In the context of temperature +/- using number line	In the context of temperature +/- mentally Personal finance pack topic

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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*	Investigate patterns of numbers in tables to 10 X table. Odd and even numbers	Multiples	Factors

Topic/Outcome/Resources	Progression		
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*	Investigate 1/3, 1/5, 1/10. Order simple fractions on a number line Find simple equivalents using charts. Find 1/2, 1/3, 1/4, 1/5, 1/10 etc of a quantity. Work with simple mixed numbers. Work with decimals to one place. Know decimal equivalents of 1/2, 1/5, 1/10, 2/10. Work with 50% and 100% and fraction and decimal equivalents	Investigate and order 1/6, 1/7, 1/8, 1/9 Find simple equivalents using number process Find 1/6, 1/7, 1/8, 1/9, 2/3, 3/4, etc of a quantity Work with decimals to two places (link to money) Know decimal and percentage equivalents of 1/4, 3/4, 1/5, 2/5, 1/100 Work with 10%, 20%, 25%, 75%, 1%	Find equivalents using number process Reduce fractions to the simplest form Find 4/5, 3/10, 5/8 etc of a quantity Investigate how you can add and subtract fractions with different denominators. Work with decimals to three places (link to measure) Know fraction, decimal and percentage equivalent forms Work with 30%, 5%, 7%, 25%, (link to profit and loss in money) Multiplication of a fraction by a one and two digit whole number

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Money *I can manage money, compare costs from different retailers, and determine what I can afford.* *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*	Work with coins and notes up to £20	Consolidate work with coins and notes up to £20	Use relationships between currencies to do simple calculations. Budgeting and bank cards. Calculate simple profit and loss. Know different ways to pay for goods and the advantages and disadvantages of these. Business/enterprise/citizenship projects.

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Measure - 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*	Read 12 hour times. Conventions of recording time. Calculate length of time (+/- simple times using clock or time line). Use simple timetables. Working out days/months before and after. Time events/compare times	Read 12 hour and 24 hour time. Convert between12 and 24 hour time Calculate durations in hours and minutes Find simple time differences using timetables. Time events using minutes and seconds Calculate simple speeds	Link with outdoor activities, health and wellbeing and journey projects. Work with more complex timetables Investigate international time differences Time activities using a digital stopwatch using seconds, tenths and hundredths of a second. Work with simple time/distance/speed calculations.

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Measure & Estimate *Length; weight; area; volume; perimeter; temperature*	Estimate, measure & order length, weight, area and volume in standard units.	Estimate, measure & order and apply length, weight, area and volume in standard units.	Estimate, measure & order length, weight, area, volume and temperature
I can use my knowledge of the size of familiar objects or places to assist me when making an estimate of measure. *MNU 2-11a*	(m, 1/2 m 1/10m, cm, cm^2 m^2 g, kg, l, 1/2 l and 1/4l)	(ml mm km) Use measure scales	(Tonne, km^2, C, hectares, cl, and awareness of common imperial measurement) Use detailed measure scales
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*	As above mm-cm-m-km ml-l g-kg	As above mm-cm-m-km ml-l g-kg	As above mm-cm-m-km ml-l g-kg
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*	Find area of square, rectangle and irregular shapes using tiles/grids	Area of rectangle= L X B (using formula) Find area of right angled triangles using square grids Find volume of cube and cuboid using cubes & formula Find perimeter of shape	Find area of right angled and isosceles triangles using formula. Find volume of cube and cuboid by formula Find perimeter of more complex shapes

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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*	Link to topic work Investigate, research and present to the class • maths in the home • maths in history • maths across the curriculum sports/games scoring systems • occupations which use/require maths • famous mathematical inventions • maths in weather		
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*	Recognise and continue simple pattern. Explain rule using own words. Pattern in tables	Recognise and continue patterns. Describe a rule for a pattern with one process. Square number pattern	Recognise and continue more complex patterns to millions. Describe a rule for pattern with two processes Triangular number pattern
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*	Introduce simple equations. Use simple function machines (doubling, halving, adding and subtracting)	Further develop equations	More complex equations Use function machines in reverse for inverse operations

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Shape, Position & Movement ***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 investigations 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*	Consolidate recognition, naming, classifying and describing of spheres, hemispheres, cubes, cuboids, cones, cylinders, pyramids, prisms, octahedron Identify 2D shapes within 3D shapes. Investigate and describe the properties of triangles • right angled, equilateral and isosceles triangle, Make simple 3D shapes from nets. Build 3D objects from 2D pictures Draw 2D shapes Tile regular shapes	Discuss 2D & 3D shapes with references to faces, edges, vertices, diagonals, sides and angles. Understand radius, diameter and circumference Investigate and describe the properties of quadrilaterals Identify and name quadrilaterals. Identify simple 3D shapes from their nets. Build more complex 3D objects from more detailed 2D pictures (Lego?) Draw circles with compass Tile with more complex shapes	Consolidate naming/describing of quadrilaterals. Use properties of 2D and 3D shapes. Discuss side, angle, diagonal properties. Relate radius, diameter and circumference to practical investigations. Identify and make more complex 3D shapes from nets Further develop 2D representations of 3D objects Draw more complex 2D shapes Construct triangle using length and angle Tile with curved shapes

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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*	Compare and order angles Explore and identify acute and obtuse angles	Estimate and measure angles	Calculate size of angles. Explore and identify reflex angles
I can accurately measure and draw angles using appropriate equipment, applying my skills to problems in context. *MTH 2-17b*	Measure and draw simple angles	Measure and draw angles using protractor to 5°	Measure all angles accurately + /- 2°
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*	Consolidate the four compass points (NSEW) Describe main features of a familiar route/journey.	Use 8 point compass and know angles between points	Introduce 3-figure bearings to describe directions
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*	Create paths using a sequence of instructions Textease Turtle Beebot Roamer	Create paths using a sequence of instructions Textease Turtle	Create paths using a sequence of instructions Textease Turtle
I can use my knowledge of the co-ordinate system to plot and describe the location of a point on a grid. *MTH 2-18a*	Identify use and language of scale	Convert simple scales 1:2, 1:10, 1:5 using maps	Produce accurate scale drawings to + or – 2 units of accuracy. Calculate distances using scale.
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*	Use coordinate notation Complete a drawing on a co-ordinate grid	Use coordinates in 2 quadrants Complete a drawing on a 2-quadrant co-ordinate grid	Use coordinates in 4 quadrants Complete a drawing on a 4-quadrant co-ordinate grid
	Work with 2 lines of symmetry and create symmetrical patterns	Work with multiple lines of symmetry and create symmetrical shapes	Work with rotational symmetry and translation and create symmetrical shapes

Information Handling ***Data and 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*	Collect, display and interpret Work with: • table • chart • bar graphs • histograms • simple databases • simple spreadsheet Tally marks & frequency Averages Simple questionnaire Use computer package where possible	Collect, display and interpret Work with: • Line graphs (plotted and joined) • Simple pie chart • Database (up to 3 fields) • Spread sheet (up to 3 fields) Mean and median introduced Multi-response questionnaire Use computer package where possible	Collect, display and interpret Work with: • More complex pie chart • Scatter graph • Databases • Spreadsheets Consolidate mean, median. Design efficient questionnaires Undertake more detailed surveys Use computer package where possible

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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*	Introduce language of likelihood (impossible, unlikely, likely, certain) to predict probability	Investigate chance e.g. tossing coin, dice, and predict outcomes. Consider fair and unfair	Fair, unfair and bias testing. One in two chance etc
Problem Solving & Enquiry Strategies *I can use these the strategies in practical situations*	Try a simpler case; Act out the situation; Produce an organised list or table; Draw a picture, diagram, or make a model; Look for a pattern; Work backwards; Guess, check and improve a solution; Make a conjecture & test it		