Level 1 to 3 Pathways Overview

- Benchmarks have been highlighted using the kite bullet
- Benchmarks that are underlined are the responsibility of all subjects

Significant Aspects of Learning (SAL) for each level is in bold

❹ indicates topics which are benchmarked at level 4 but we feel should be included as part of level 3

Topic Time		1st Level Upper		2nd Level Core	2nd Level Upper		3rd Level Core
1 – 8 periods	MNU 101a MNU 102a MNU 103a	➢ **Rounds whole numbers to the nearest 10 and 100** ➢ **Identifies the value of each digit e.g. 867 = 800 + 60 + 7.** ➢ **+/- three digit numbers.** ➢ **+/- Multiples of 10 or 100 to or from < 1000.** ➢ strategies to determine ÷/x facts e.g. repeated subtr/add, equal groups, etc. ➢ **x/÷ by 10, 100**	Whole Numbers MNU 203a Rounding/ Estimate MNU 201a Number Operation Calc MNU 203c	➢ Read/write/order numbers up to 1 million ○ x/÷ by single digit ○ Different methods for 4 rules (+9 = +10 – 1) ➢ **x/÷ by 10, 100, 1000** ➢ **+/- multiples of 10, 100, 1000 to/from whole numbers**	➢ **Round to nearest 100, 1000, 10000** ➢ **Multiply 2/3 by 2 digit e.g. 200×70** ➢ **BODMAS** ➢ **Applies knowledge of rounding to give an estimate to a calculation appropriate to the context.**	Whole Numbers MNU 303a Rounding/ Estimate MNU 301a Number Operation Calculation MNU 303b	○ Place value order of numbers & notation (up to millions?) ○ +/– in context (4 digits) ➢ x/÷ by single digit ○ x/÷ by 10, 100, 1000 ○ x/÷ by multiples of above ➢ **Revise rounding to nearest 10, 100, 1000 and 10000**
2 - 6 periods	MNU 109a MNU 111b	➢ Records amounts accurately using correct notation, e.g. 149p = £1·49 and 7p = £0·07. ➢ Applies mental agility to calculate the total spent and change required. ➢ Reads a variety of scales including those with simple fractions	Place Value MNU 202a Decimals MNU 203b	➢ **Know column headings (zero as place holder)** ➢ Partition numbers extend to 3.6=36/10 ➢ Order decimals (3 dp) ➢ Decimal sequences ➢ Position decimals on a number line (1 dp) ➢ +/– Decimals (2 dp) ➢ Know £4.3 = £4.30, etc.	➢ Order decimals (3 dp) ➢ Decimal sequences ➢ Position decimals on a number line ➢ x/÷ single digit (2 dp) ➢ x/÷ by 10, 100, 1000 (2dp) ➢ **Rounding to 2 dp (money-nearest penny)** ➢ using a calculator	Decimals MNU 307a (part) MNU 301a (part)	➢ Reading decimal scales (3 dp) ➢ **Rounding to 1/3 d. p.** ➢ +/– decimals to 3 d. p. ➢ x/÷ by 10, 100, 1000 ○ x/÷ by single digit
3 - 4 periods	MNU 120a MNU 120b MNU 121a	➢ Uses a variety of different methods, including the use of technologies, to display data, e.g., block/bar graphs, tables, Carroll/Venn diag. ➢ Includes a suitable title, simple labelling on both axes and an appropriate scale where one unit represents more than one data value in graphs. ➢ **Answers questions to extract key information from a variety of data sets.**	Data Handling MTH 321a	○ **Choose and explain format of display** ○ **Construct bar, line, pictograms and tables** ➢ Analyses, interprets and draws conclusions from data.	○ **Choose and explain format of display** ○ **Construct pie** (simple fractions)**, pictograms** ➢ Displays data appropriately making effective use of technology and chooses a suitable scale when creating graphs. ➢ Analyses, interprets and draws conclusions from a variety of data.	Data Handling MTH 321a	○ (Pictograms/Bar Charts) ○ Frequency tables ○ Line graphs ○ Interpret Pie charts (using %) ➢ Describes **Trends** in data using appropriate language ○ **Distribution?** ➢ **Consequences?**
8	Block 1 Test				Misleading Statistics Project		Misleading Statistics Project

Topic Time		1st Level Upper		2nd Level Core	2nd Level Upper		3rd Level Core
4 - 4 periods	Time MNU 110a MNU 110b MNU 110c	➢ Tells the time using half/ quarter past/to using analogue & digital 12 hour clocks. ➢ Records 12 hour times using am/pm and is able to identify 24 hour notation, ➢ Uses/interprets variety of calendars & 12 hour timetables to plan events.	Time MNU 210a MNU 210b MNU 210c	○ read dig/anal clocks ○ equate dig/anal times ➢ convert 12-24 hr time ➢ Uses and interprets a range of electronic and paper-based timetables and calendars to plan events or activities and solve real life problems. ➢ Duration of activities (incl across an hour)	➢ Conversions e.g. 1¾ hrs ➢ Uses and interprets a range of electronic and paper-based timetables and calendars to plan events or activities and solve real life problems. ➢ Duration of activities (incl across several hours) ➢ Calc t given d and s.	Time MNU 210a MNU 210b MNU 210c Speed, Dist and Time MNU 310a	○ Time units revision ○ Reading timetables ○ Calculating time from distance/speed –basic ○ Measuring time ○ **S/D/T proportion**
5 - 12 periods	Frac MNU 107a MNU 107b MTH 107c	➢ Uses correct notation for common fractions <tenths ➢ Compares the size of fractions and places simple fractions in order on a number line ➢ find unit fractions of whole numbers ➢ Uses pictorial representations and other models to demonstrate understanding of simple equivalent fractions	Frac MNU 207a Fraction Manip MTH 207b MTH 207c	➢ Simple Fractions of quantity ➢ Simple Percentages of quantity (10%, 20%, 25%, 50%, 75%, 100%) ○ Fraction board to identify equivalent fractions ➢ Simplify fractions (non unit)	➢ **Equivalence common frac/dec/% (**33⅓, 66⅔%) ➢ Create sets of equal fractions by multiplying ➢ Simp frac (non unit) ○ Order fractions (common) ➢ Further frac/% of quantity ➢ Calculates simple %s of a quantity, and uses this to solve problems in everyday contexts, e.g. calculates the sale price of an item with a discount of 15%.	Frac & %s MNU 307a (revisit) Fraction Manipulation MTH 307b Mixed Numbers MTH 307c	➢ Fractions/decimals/ %s equivalence ○ **Fractions of quantity** ○ Decimals of quantity ○ Percentages of quantity ○ Simplifying fractions 12/15, etc ➢ **Convert fractions mixed to/from top heavy** ○ Equivalent fractions ➢ **+/-simple fractions** (same denom incl > 1) ➢ Uses knowledge of fractions, decimal and %s to carry out calcs with/without a calculator.
6 - 6 periods	Angles MTH 117a	➢ Knows right angle is 90° ➢ Finds R-angles in the environment & in 2D shapes ➢ Compare and describe the size of angles in relation to a R-angle.	Angles MTH 217a MTH 217b	➢ Classify angles identified within shapes in the environment ○ Estimate then measure angles (acute & obtuse) (±2°)	➢ Revise classifying angles. ➢ Supplementary and complementary angles ○ Drawing angles (±2°)	Angles – properties/ triangles MTH 317a	○ Recap types of angles ➢ Naming angles e.g. ABC ○ **Calculating angles: Supp, Comp, X, F, Z, angles in a Δ & round a point**
7 - 2 periods	Symmetry MTH 119a	➢ Identifies symmetry in patterns, pictures, nature and 2D shapes. ➢ Creates symmetrical pictures and designs with more than one line of symmetry.	Symmetry MTH 219a	➢ **Identify/illustrate lines of symmetry in simple 2D shapes**	➢ **Complete line symmetry patterns and pictures with/without the use of digital technology**	Symmetry MTH 319a	➢ Draw/indentify all lines of symmetry in 2D shapes ➢ Create symmetrical patterns and pictures
8	Block 2 Test				Budgeting		Budgeting

Topic Time		1st Level Upper		2nd Level Core	2nd Level Upper		3rd Level Core
8 - 8 periods	Coords MTH 118a Neg Nos MNU 111a (adapted)	➢ Identifies where and why grid references are used. ➢ Describes, plots and uses accurate two figure grid references ➢ Records measurements of temperature nearest standard unit	Coords MTH 218a Neg Nos MNU 204a	➢ **Coord format (1st Quad)** ➢ **Plot/identify coordinates** ➢ **Locate neg numbers on a number line.** ➢ **Identifies familiar contexts in which neg nos are used.**	➢ **Coord format (1st Quad)** ○ Plot & join pts to produce shapes, patterns, etc. ○ **Order +/– nos.** ➢ **Solve probs in context with ref to number line**	Coords (4 quads) MTH 318a Negative Nos incl manipulation MNU 304a	○ Plot/Identifying coords - 1st Quad (recap) ➢ ❹ -Extend to 4 quads -Plotting/ reading ○ Number line, difference temperature, banking ➢ **+/– integers (in context)** ➢ **x/÷ integers (in context)**
9 - 4 periods	Measure Units MNU 111a MNU 111b	➢ Records measurements of length and mass to nearest standard unit ➢ Simple conversions, e.g. 1 m 58 cm = 158 cm.	Measure Units MNU 211a MNU 211b Perimeter MNU 211c	➢ Estimates to the nearest appropriate unit, then measures: length, mass and capacity ➢ **Centi/kilo conversion** ➢ **P of □▯△ (add sides)**	➢ Read scales (values miss) ➢ **Centi/kilo conversion using decimal notation** ➢ **P of composite shapes** ➢ **Find missing side(s) given P**	Measure Units MNU 211a/b Measure – length, vol, weight MNU 311a (part)	○ **Revise mm, cm, m, km conversion** ○ **Introduce units for volume/weight** ➢ +/–/x/÷ different units ➢ P of □, ▯, ◣ with inconsistent units
10 - 6 periods	Area 2D Shape MNU 111b	➢ Use square grids to find the area of a variety of 2D shapes. ➢	Area 2D Shape MNU 211c	○ **Area of same surface using diff sized tiles.** ○ **Calculate the area of squares, rectangles** ➢ **Draw rectangles with same A/P**	○ **Revise Area of same surface using diff sized tiles.** ➢ **Calculate the area of squares, rectangles and right-angled triangles**	Areas of 2D Shape MNU 311a Compound shapes MTH 311b	➢ A of □, ▯, ◣ with inconsistent units ○ **Area of any triangle** A = ½bh (S1/2 only) ○ Investigate C of a circle ○ A of linear Composite shapes
11 - 5 periods	Measure Units MNU 111a MNU 111b	➢ Records measurements capacity to nearest standard unit (ml and l) ➢ Simple conversions, e.g. 2 l 500 ml = 2.5 l ➢ Read scales with simple fractions e.g. ½ litre.	Volume MNU 211c	○ **Find volume by counting cubes** ○ **Investigate vol of simple 3D shapes** (cubes/cuboids) by building from layers	○ **Volume of simple 3D shapes** (cubes/cuboids) by building from layers. ➢ **Calc the vol of cubes/ cuboids in cm^3 & m^3**	Volume MNU 311a (revisit) Volume of compound MTH 311b (revisit)	➢ **Vol of cuboid/cube using formulae** ○ Volume in context 1ml = $1cm^3$ = 1g (water) ○ Volume of compound 3D shapes + in context
12 - 8 periods	Expressi-ons & Equations MTH 115a MTH 115b	➢ Uses the related symbols (=, ≠, <, >) when comparing quantities. ➢ Solves simple algebraic problems e. g. ◆ + 17 = 30 and ◆ × 6 = 30.	Expressi-ons & Equations MTH 215a	○ Meaning of 'solve an equation' & 'variables' ➢ Simple eqns: a + 7 = 17 b - 6 = 20 ○ Number machines – find output	○ Meaning of 'solve an equation' & 'variables' ➢ Simple eqns: a - 30 = 40 4b = 20 ○ Number machines – find input	Algebra – Collecting like terms/ substitution MTH 314a Algebra – Equations MTH 315a	➢ Collecting like terms (2 variables) ➢ **Substitution** (+/-/x) ➢ Making Equations: x + b = c, ax = b ○ Solving above Equations
8	Block 3 test	Impact of Maths in our global environment			Impact of Maths in our global environment		

Topic Time		1st Level Upper		2nd Level Core	2nd Level Upper		3rd Level Core
13 - 9 periods	MNU 102a MNU 103a	➢ Applies strategies to determine multiplication facts, e.g. repeated addition, grouping, arrays and multiplication facts. ➢ Use multiplication/division facts to solve problems within the range 0 - 1000.	Multiples / Factors MTH 205a	➢ **Identify multiples a given number** ○ **Solving relative problems in number, money and measurement.**	➢ **Identifying factors of a given number** ○ **Solving relative problems in number, money and measurement.**	Multiples / Factors MTH 305a Primes MTH 305b Powers MTH 306a	➢ Identify common multiples & **LCM** & explain method ➢ Identify common factors & **HCF** & explain method ➢ **Identify Prime nos (<100)** ➢ **Notation/vocabulary: "index", "power", "exp".** ○ **Evaluate wh no powers (2^4=16) inc using a calc**
14 - 9 periods	MTH 116a MTH 116b	➢ Names, identifies and classifies a range of simple 2D/3D objects. ➢ Uses mathematical language (including side, face, edge, vertex, base and angle) to describe common 2D/3D objects ➢ Identifies 2D shapes in 3D objects ➢ Recognises 3D objects from 2D drawings. ➢ Identify examples of tiling in the environment & applies knowledge to create tiling patterns (2 diff shape tiles)	Props of 2D Shapes MTH 216a Nets MTH 216b Drawing 2D & 3D Shapes MTH 216c	➢ Terms: radius, diagonals, diameter, circumference, scalene, isosceles, equilateral, right-angled, net, regular/irregular ➢ Shapes in the environment (properties v function) ○ **Skeletal models**	➢ r and d relationship ○ **Properties of 3D shapes** ○ **Recognise and draw nets of common solids** ➢ Accurately draw 2D shape (incl using technology) ○ **3D sketches (□/Δ paper) understanding that not all parts can be seen)**	Properties of 2D Shapes MTH 317a (revisit) Drawing 2D Shapes MTH 316a	○ Properties of triangles ○ Properties of Rhombus, Trapezium, Kite, Parallelogram ○ Polygons in context ○ Circle properties, r, d, centre ○ Ruler, compass, tiling, protractor, tessellations **2D-shapes Construction** (triangles & regular polygons given interior angle)
15 - 6 periods	Sequences and Formulae MTH 113a MTH 113b	➢ Describes, continues and creates number patterns using addition, subtraction, doubling, halving, counting in jumps (skip counting) and known multiples.	Sequences and Formulae MTH 213a	○ **Recognise sequences – 4 rules** ➢ **Recall & extend well known sequences – count, odd, even numbers**	○ **Extend a sequence** ➢ Describe a sequence so that a partner can re-produce it – "Start at….. then …." ➢ **Recall & extend well known sequences – count, odd, even, □, Δ & Fibonacci numbers**	Producing formula MTN 315b Number Seq/rules MTH 313a	➢ Extend a given number patterns & describe the rule ○ **Producing simple formula** (one-step – x+3, x-2, 2x, x/2, etc.) ➢ Generates number sequence from a given rule (T=4n+6)
16 - 6 periods	MNU 103a MNU 109a	➢ <u>Solves two step problems.</u> ➢ <u>Uses a variety of coin & note combinations, to pay for items and give change within £10.</u>	Proportion & Ratio (Not in level 2) Money MNU 209a	○ Finding a unit cost ➢ <u>Carries out money calculations involving the four operators (+/-)</u>	○ Finding a unit cost ○ Using the unit cost to find a new price ○ ❸ Picture ratios ➢ <u>Carries out money calculations involving the four operators (x/÷)</u>	Proportion & Ratio MNU 308a	➢ **<u>Direct proportion</u>** (if 6 cost … find cost of …) ➢ <u>Foreign exchange</u> (simple) ○ Establish Ratio from pictures ➢ <u>Simplifying ratios</u> ➢ Express quantities as a ratio (inc simplifying)
Block 4 test							

Topic Time		1st Level Upper		2nd Level Core	2nd Level Upper		3rd Level Core
17 - 2 periods	Probability MNU 122a	➢ Uses mathematical vocabulary appropriately to describe the likelihood of events occurring in everyday situations including, probable, likely/unlikely, certain/uncertain, possible/impossible, and fair/unfair. ➢ Interprets data gathered through everyday experiences to make reasonable predictions of the likelihood of an event occurring.	Probability MNU 222a	➢ **Plan & carry out a simple experiment involving chance with repeated trial.**	➢ **Assign a numerical value to the likelihood of simple events occurring – 1 in 6** ➢ Uses data to predict	Probability MNU 322a	➢ Use probability scale of 0 to 1 showing probability as a fraction or decimal ➢ Simple probability P(A) as a fraction ➢ Identifies all of the mutually exclusive outcomes of a single event & calculates the probability of each. ○
18 - 4 periods	MTH 117a	➢ Uses technology and other methods to describe, follow and record directions using words associated with angles, directions and turns including, full turn, half turn, quarter turn, clockwise, anticlockwise, right turn, left turn, right angle. ➢ Knows and uses the compass points, North, South, East and West.	Maps and coords MTH 217c Scales, Maps & Plans MTH 217d	➢ **Know that a North line has to be drawn before a bearing can be drawn.** ➢ **Give directions using an 8-point compass**	➢ **Interpret compass bearings on a map** ➢ Uses knowledge of the link between the 8 compass points and angles to describe, follow and record directions. ➢ Interpret simple models, maps and plans in order to calculate the real dimensions with simple scales.	Enlarge / Reduce MTH 317c Bearings / Maps MTH 317b	➢ **Scale drawing (±2mm, ±2°)** ➢ **Enlarging & reducing lines and regular shapes** Compass bearings/3 figure bearings

Project	Outcome	Content	
Mis-leading Statistics	Information Handling MNU 220a MNU 220b	➢ Interpret and draw conclusions from a range of data displays ➢ Compare & discuss different displays of the same data ➢ **Understand that the method used to collect information can affect the data gathered.** ➢ Recognise when presentation is misleading and discuss causes ➢ **Realise that data representation may be deliberately misleading** ➢ Identify a range of ways to collect, organise and display data ➢ Appreciate that the method chosen to display the data needs to fit the purpose of the task	➢ Devises ways of collecting data . . . .: observations, surveys, questionnaires, experiments ➢ Choose the most efficient way to organise their data ➢ Collects, organises and displays data accurately. . . ➢ Explain and justify why their choice of display is appropriate for illustrating their data effectively ➢ Draw conclusions about the reliability of data taking into account e.g. the audience, the scale and sample size used. From their findings and communicate them clearly, concisely and accurately.
	Information Handling MNU 320a MTH 320b	➢ Sources information or collects data making use of digital technology. ➢ Interpret information from a variety of sources including internet, TV, newspapers ➢ Interpret data presented as pictographs, line graphs, bar graphs, scatter diagrams, etc. ➢ **Misleading Data – assess (robust/vague/misleading) and explain (validity of source, scale used, sample size, method of presentation & appropriateness of how the sample was selected).**	
Budgeting	Money MNU 209a MNU 209b MNU 209c	○ Appreciate the benefits of 'shopping around' ○ Know that there can be hidden costs when purchasing items, *e.g. fuel, postage, delivery, VAT* ○ Know how to interpret sales info, realising it can be ambiguous ○ Understand that marketing strategies can be misleading ➢ Compare costs and determines affordability within a given budget. ○ Consider special offers, *e.g. 3 for the price of 2, 50% extra free – Is it really a bargain?* ○ Plan purchases after costing things out ○ Use a variety of methods to calculate cost (mental, written, calc) ○ Explain how they solved a problem, oral or written ○ Understand and use terms such as *budget, balance, overdrawn, interest, credit, debit, account, statement, PIN,ATM, withdrawal*	○ Know the purposes of different types of bank account ○ Understand the importance of budgeting and the advantages/disadvantages of saving and borrowing ○ Know the benefits of bank/card accounts ○ Appreciate that certain charges may be levied on an account and understand the financial implications of being overdrawn ○ Know the potential risks of using bank cards to obtain cash or purchase goods at an ATM, or on the Internet ○ Appreciate the importance of keeping PIN information secure ○ Read and interpret bank card statements ➢ Demonstrates understanding of the benefits and risks of using bank cards and digital technologies. ○ Know the meaning of the terms profit/loss & able to explain them ➢ Calculates profit & loss accurately, e.g. when working with a budget for an enterprise activity.
	Money MNU 309a MNU 309b	○ Real life financial choices e.g. bank accounts, loans, credit, credit cards and cash back ○ Investigate, compare & explain financial contracts e.g. mobile phones, sky and broadband ○ Living expenses and budgeting ➢ Demonstrates understanding of best value in relation to contracts and services when comparing products. ➢ Chooses the best value for their personal situation and justifies choices. ➢ Budgets effectively, using digital technology where appropriate, showing development of financial capability. ➢ Demonstrates knowledge of financial terms, for example, debit/credit, APR, pa, direct debit/standing order and interest rate.	

Project	Outcome	Content
Impact of Maths in our global environment	MTH 112a	➢ Investigates and shares understanding of the importance of numbers in learning, life and work. ➢ Investigates and shares understanding of a variety of number systems used throughout history.
	MTH 212a	o Be aware of how mathematics impacts on our daily lives o Appreciate that mathematics underpins scientific and technological progress o Recognise that statistics play an important role in changing minds and behaviour e.g. Florence Nightingale's lobbying for funding, Richard Doll's pioneering work in connecting smoking with lung cancer, use of statistics in current political discourse o Describe the importance of mathematics in major technological, scientific and medical breakthroughs o Participate in learning activities which give them the opportunity to collaborate, discuss and investigate independently, or in teams o Choose how to record the information they have gathered, e.g. use of ICT, posters, mind-maps o Present and explain their findings to a variety of audiences ➢ Researches and presents examples of the impact mathematics has in the world of life and work. ➢ Contributes to discussions and activities on the role of mathematics in the creation of important inventions, now and in the past.
Famous Mathematicians	Famous Mathem-aticians MTH 312a	o **Famous Mathematicians – Why are they famous? Where did they learn stuff? Who did they work with? How is their work relevant today?** o **Use a variety of methods to research, discuss & present their contributions** ➢ Researches and communicates using appropriate mathematical vocabulary and notation, the work of a famous mathematician or a mathematical topic and explains the relevance and impact they have on society.