

Overview: consolidating level 3 and introducing level 4

Unit	Hours	Beyond the Classroom
Integers, powers and roots	7	L4NNS2
Sequences, functions and graphs	6	L3ALG1 and L4NNS1
Geometrical reasoning: lines, angles and shapes	7	L3SSM1 and L4HD3
Construction and loci	3	L3SSM2 and L4SSM4
Probability	3	
Ratio and proportion	4	
Equations, formulae, identities and expressions	4	
Measures and mensuration; area	5	L4SSM6
Learning review 1		
Sequences, functions and graphs; coordinates	3	L3SSM3
Mental calculations and checking	7	L3NNS2 and L3CALC1
Written calculations and checking	7	L3CALC6 and L4CALC6
Transformations	6	L3SSM4
Processing and representing data; Interpreting and discussing results	7	L3HD2
Solving problems	5	
Learning review 2		
Fractions, decimals and percentages	9	L3NNS4
Measures and mensuration	4	L3SSM5 and L4SSM5
Calculations and checking	5	L3CALC4 and L4NNS3
Geometrical reasoning and mensuration	7	
Statistical enquiry	7	L3HD1 , L4HD1
Learning review 3		

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[CLICK HERE FOR ASSESSMENT GUIDELINES](#)

11-16 Pathway				
		3 to D+	4 to C+	5 to A+
Stage	1	2	3	
	2	3	4	
	3	4	5	
	4	5	6	
	5*	6*	7	

[More information](#)



Previously...

- Use positive and negative numbers in context and position them on a number line (Y4)
- Recall quickly multiplication facts up to 10×10 and use them to multiply pairs of multiples of 10 and 100; derive quickly corresponding division facts (Y5)

• **Tabulate systematically the information in a problem or puzzle (Y6)**

- Identify pairs of factors of two-digit whole numbers and find common multiples (e.g. for 6 and 9) (Y5)
- Find the difference between a positive and a negative integer, or two negative integers, in context (Y6)
- Recognise that prime numbers have only two factors and identify prime numbers less than 100; find the prime factors of two-digit numbers (Y6)
- Use knowledge of multiplication facts to derive quickly squares of numbers to 12×12 and the corresponding squares of multiples of 10 (Y6)

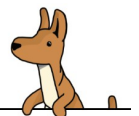
Next...

- Recognise and use multiples, factors, primes (less than 100), common factors, highest common factors and lowest common multiples in simple cases; use simple tests of divisibility
- Understand negative numbers as positions on a number line; order, add and subtract positive and negative integers in context.
- Recognise the first few triangular numbers, squares of numbers to at least 12×12 and the corresponding roots

Autumn Term 7 hours

Suggested Activities	Criteria for Success
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Cuisenaire factors ▪ Sieve of Eratosthenes ▪ KPO: Goldbach's Conjecture ▪ Ordering events number line <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Problem Solving: v2 <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Numbers and the Number System: Number relationships <p>Resources</p> <ul style="list-style-type: none"> ▪ <i>Number line - extend to negative number line; consider negative movement along number line</i> ▪ ATM Mats ▪ <i>Multilink cubes</i> 	<p>What patterns arise when you multiply consecutive pairs / triples?</p> <p>Is there a pattern in the prime numbers?</p> <p>How do you know when you have found all the factors of a number?</p> <p>How many floors do you go up when going from the basement to the 3rd floor?</p> <p>Why are square numbers called square numbers?</p> <p>When using the sieve of Eratosthenes, why do we stop at multiples of 7?</p> <p>How many multiples of three are there?</p> <p>Is 3752 divisible by 2, 5, 10?</p>

- Level Ladders**
- [Powers, integers, roots](#)
- Beyond the Classroom**
- [Number Relationships](#)
- APP**
Look for learners doing:
- [L3UA3](#)
 - [L4NNS2*](#)
 - [L4UA3](#)



Previously...

- Recognise and continue number sequences formed by counting on or back in steps of constant size (Y4)
- **Choose and use appropriate calculation strategies at each stage, including calculator use* (Y6)**
- **Explain reasoning and conclusions, using words, symbols or diagrams as appropriate** (Y6)**
- Count from any given number in whole-number and decimal steps, extending beyond zero when counting backwards; relate the numbers to their position on a number line (Y5)
- Represent and interpret sequences, patterns and relationships involving numbers and shapes (Y6)
- Describe integer sequences; generate terms of a simple sequence, given a rule (e.g. finding a term from the previous term, finding a term given its position in the sequence)

Next...

- Generate sequences from patterns or practical contexts and describe the general term in simple cases

Autumn Term 6 hours

Suggested Activities	Criteria for Success
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Basic Sequences ▪ KPO*: Happy and Sad Numbers ▪ Number sequences 1 ▪ Number sequences 2 ▪ KPO*: Number sequences 3 ▪ Handshakes. SEN support and mark-scheme <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Calculations: v1 ▪ Algebra: v1 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Algebraic Expressions: v1 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Algebra: Sequences of numbers <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Numbers and the Number System: Number patterns: divisibility testing <p>Resources Physical equipment - multilink, matchsticks, counters, pattern blocks etc. so that the shape can illustrate the rules generated.</p>	<p>NCETM Departmental Workshops</p> <ul style="list-style-type: none"> ▪ Sequences <p>NRICH</p> <ul style="list-style-type: none"> • Swimming Pool • Tug Harder! • First Connect Three • Sticky Triangles <p>What is the next term, what is the 10th term? Why?</p> <p>Show me an example of a number sequence:</p> <ul style="list-style-type: none"> ▪ with an increasing pattern ▪ with a decreasing pattern <p>What is the same/different: 4, 7, 10, 13, ... and 13, 10, 7, 4, ...</p> <p>True/Never/Sometimes: A sequence always goes up in equal steps</p> <p>Convince me that the number '___' is in this sequence</p>
	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Sequences, functions and graphs <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Sequences ▪ Number Patterns <p>APP Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L3ALG1* ▪ L3UA1 ▪ L4NNS1*



Previously...

- Know that angles are measured in degrees and that one whole turn is 360° ; compare and order angles less than 180° (Y5)
- Recognise parallel and perpendicular lines in grids and shapes; use a set-square and ruler to draw shapes with perpendicular or parallel sides (Y5)

- Identify, visualise and describe properties of rectangles, triangles, regular polygons and 3-D solids (Y5)
- Calculate angles in a straight line (Y5)
- Describe, identify and visualise parallel and perpendicular edges or faces; use these properties to classify 2-D shapes and 3-D solids (Y6)
- Calculate angles in a triangle or around a point (Y6)

Next...

- Use correctly the vocabulary, notation and labelling conventions for lines, angles and shapes
- Identify parallel and perpendicular lines; know the sum of angles at a point, on a straight line and in a triangle; recognise vertically opposite angles
- Identify and use angle, side and symmetry properties of triangles and quadrilaterals; explore geometrical problems involving these properties, explaining reasoning orally, using step-by-step deduction supported by diagrams

Autumn Term 7 hours

Suggested Activities	Criteria for Success
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Angle vocabulary ▪ Naming Shapes ▪ 3x3, 4x4, 5x5 dotted paper activities ▪ Triangles on isometric paper - how many different angles can you make? What is the sum of the angles? ▪ Triangles on squared dotted paper - make several different triangles - what is the sum of all their angles? ▪ Draw me a shape that has ... <p>Autograph Resources</p> <ul style="list-style-type: none"> ▪ Angles on a straight line <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Lines and Angles: v1, v2 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Lines and Angles: v1 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Shape, Space and Measures: Classifying shapes <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Handling Data: Venn and Carroll diagrams <p>Resources</p> <ul style="list-style-type: none"> ▪ Spokes OHTs: clock (30°), compass rose (45°), 90° spray ▪ Pattern Blocks ▪ Geostrips ▪ 3x3, 4x4, 5x5 dotted paper 	<p>NCETM Departmental Workshops</p> <ul style="list-style-type: none"> ▪ Angle Properties <p>NRICH</p> <ul style="list-style-type: none"> • Where Are They? • How Safe Are You?
	<p>Classify these quadrilaterals</p> <p>Which regular polygons tessellate?</p> <p>(Using Geostrip triangles) can you make a different triangle from the same three strips? Repeat for a quadrilateral.</p> <p>Can parallel lines be curved?</p> <p>Can you have an obtuse / reflex angle in a triangle?</p>
	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Geometrical reasoning <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Classifying shapes ▪ Venn and Carroll Diagrams <p>APP</p> <p>Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L3SSM1* ▪ L3HD3 ▪ L4SSM1 ▪ L4HD3*



Previously...

- Visualise 3-D objects from 2-D drawings; make nets of common solids (Y4)
- Draw rectangles and measure and calculate their perimeters (Y4)
- Draw polygons and classify them by identifying their properties (Y4)
- Draw and measure lines to the nearest millimetre (Y5)

- Use knowledge of properties to draw 2-D shapes and identify and draw nets of 3-D shapes (Y5)
- Estimate, draw and measure acute and obtuse angles using an angle measurer or protractor to a suitable degree of accuracy (Y5)
- Make and draw shapes with increasing accuracy and apply knowledge of their properties (Y6)
- Estimate angles, and use a protractor to measure and draw them, on their own and in shapes (Y6)

Next...

- Use a ruler and protractor to:
 - measure and draw lines to the nearest millimetre and angles, including reflex angles, to the nearest degree;
 - construct a triangle given two sides and the included angle (SAS) or two angles and the included side (ASA)
- Use ICT to explore constructions

Autumn Term 3 hours

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Shape work ideas: Triangles on dotted paper ▪ Estimating angles shown on large cards; whiteboard responses; 5 points within 5 degrees, 10 points spot on, 1 point within 10 degrees ▪ Angle chanting / using spokes OHTs <p>Standards Interactive</p> <ul style="list-style-type: none"> ▪ What's my Angle? <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Shape, Space and Measures: Recognising nets <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Shape, Space and Measures: Choosing units and instruments <p>Resources</p> <ul style="list-style-type: none"> ▪ <i>Spokes OHTs</i>: clock (30°), compass rose (45°), 90° spray ▪ <i>ATM Mats</i> ▪ <i>Polydron</i> ▪ <i>Geostrips</i> ▪ <i>A set of 3D shapes</i> 	<p>NRICH</p> <ul style="list-style-type: none"> • Stringy Quads • Making Cuboids 	<p>Using spokes (like compass points), if the angle turned from 0° to here is 45°, what is the angle of turn to this point opposite?</p> <p>Can you make a triangle with sides 4cm, 7cm, 10cm?</p> <p>Can you make a triangle with sides 5cm, 5cm, 12cm?</p> <p>How many different triangles can you make with any given three Geostrips?</p> <p>How many different quadrilaterals can you make with any given four Geostrips?</p> <p>A triangle has perimeter 16cm. Its sides are all integer lengths. What could the lengths be?</p> <p>The longest side of a triangle is 5cm. All the sides are of integer length. What are the possibilities?</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Construction, loci <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Nets of 3D shapes ▪ Units and Instruments <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3SSM2* ▪ L4SSM2 ▪ L4SSM4*



Previously...

- Describe the occurrence of familiar events using the language of chance or likelihood (Y5)
- Describe and predict outcomes from data using the language of chance or likelihood (Y6)
- Understand and use the probability scale from 0 to 1; find and justify probabilities based on equally likely outcomes in simple contexts; identify all the possible mutually exclusive outcomes of a single event

Next...

- Use vocabulary and ideas of probability, drawing on experience
- Estimate probabilities by collecting data from a simple experiment and recording it in a frequency table; compare experimental and theoretical probabilities in simple contexts

Autumn Term 3 hours

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Loop cards ▪ Dice activities ▪ Probability pots <p>Make shape cards so that, for example, the probability that you will pick up a card that shows a shape with at least one right angle is $\frac{1}{4}$.</p> <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Probability: v1 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Probability: v1 <p>Resources</p> <ul style="list-style-type: none"> ▪ Probability scale ▪ Probability recording sheets 	<p>NRICH</p> <ul style="list-style-type: none"> • Domino Pick • Odds or Sixes? • Twelve Pointed Star Game • Same or Different? • Tricky Track 	<p>The probability it will rain tomorrow is $\frac{1}{2}$ - True or False? Why?</p> <p>True / Never / Sometimes: If I flip a coin 100 times I will get 50 heads?</p> <p>If you repeat this experiment, will you always / sometimes / never get the same result?</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Probability <p>APP</p> <p>Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L5HD3



Previously...

- Use the vocabulary of ratio and proportion to describe the relationship between two quantities (e.g. 'There are 2 red beads to every 3 blue beads, or 2 beads in every 5 beads are red'); estimate a proportion (e.g. 'About one quarter of the apples in the box are green') (Y4)

- Use sequences to scale numbers up or down; solve problems involving proportions of quantities (e.g. decrease quantities in a recipe designed to feed six people) (Y5)
- Solve simple problems involving direct proportion by scaling quantities up or down (Y6)

Next...

- Understand the relationship between ratio and proportion; use direct proportion in simple contexts; use ratio notation, simplify ratios and divide a quantity into two parts in a given ratio; solve simple problems involving ratio and proportion using informal strategies

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ <u>Problem Solving</u>: v1, v2 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ <u>Ratio and Proportion 1</u>: v1, v2 <p>Resources</p> <ul style="list-style-type: none"> ▪ Proportional sets 1 ▪ Proportional sets 2 ▪ <i>Counting stick</i> ▪ <i>Fraction wall</i> ▪ <i>Cuisenaire rods</i> 	<p>NRICH</p> <ul style="list-style-type: none"> • Blackcurrantiest • Orange Drink • Pumpkin Pie Problem 	<p>Use multilink cubes (or strips) to make some cuboids that show various ratios.</p> <p>Show me a set of coloured pencils that are in the ratio 2:3</p> <p>True/Never/Sometimes:</p> <ul style="list-style-type: none"> ▪ The ratio 1:4 is the same as the ratio 4:1 ▪ The bigger number comes first in a ratio <p>What is the same different about: The ratio 1:4 and the ratio 4:1</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Fractions ▪ Percentages <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L4NNS4 ▪ L4NNS6 ▪ L4CALC5



Previously...

- Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols (Y4)
- Explore patterns, properties and relationships and propose a general statement involving numbers or shapes (Y5)
- Explain reasoning using diagrams, graphs and text; refine ways of recording using images and symbols (Y5)

- **Solve multi-step problems*** (Y6)
- **Use symbols where appropriate**** (Y6)
- **Construct and use simple expressions and formulae in words then symbols (e.g. the cost of c pens at 15 pence each is $15c$ pence)**** (Y6)
- Explain reasoning and conclusions, using words, symbols or diagrams as appropriate (Y6)
- Use letter symbols to represent unknown numbers or variables; know the meanings of the words *term*, *expression* and *equation*
- Simplify linear algebraic expressions by collecting like terms

Next...

- Understand that algebraic operations follow the rules of arithmetic
- Multiply a single term over a bracket (integer coefficients)
- Substitute positive integers into linear expressions

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ KPO*: 20g weight 50g plasticene ▪ KPO**: Cuisenaire algebra 1 <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Algebra: v1 ▪ Order of Operations: v1 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Algebraic Equations: v1 ▪ Algebraic Expressions: v1, v2 <p>Resources</p> <p>Snakes for substitution. Use spider diagrams for building up expressions.</p>	<p>NCETM Departmental Workshops</p> <ul style="list-style-type: none"> ▪ Constructing Equations <p>NRICH</p> <ul style="list-style-type: none"> • Make 37 • Got It! 	<p>Show me an expression with simplifies to $7x$.</p> <p>True / Never / Sometimes: n^2 is the same as $2n$</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Equations, formulae, identities <p>APP</p> <p>Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L3UA4 ▪ L4ALG1



Previously...

- Find the area of rectilinear shapes drawn on a square grid by counting squares (Y4)
- Measure and calculate the perimeter of regular and irregular polygons (Y5)
- Use the formula for the area of a rectangle to calculate the rectangle's area (Y5)
- Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares (Y6)

Next...

- Choose and use units of measurement to measure, estimate, calculate and solve problems in everyday contexts
- Know and use the formula for the area of a rectangle; calculate the perimeter and area of shapes made from rectangles
- Calculate the surface area of cubes and cuboids

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ 3x3, 4x4, 5x5 doty paper activities - 4x4 Find the squares, triangles etc... then find the areas of the shapes you have drawn. ▪ Shape work <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Shape, Space and Measures: Area and perimeter <p>Resources</p> <ul style="list-style-type: none"> ▪ <i>Arrays of counters to link with area</i> ▪ <i>HTU Chart</i> ▪ 3x3, 4x4, 5x5 doty paper 	<p>NRICH</p> <ul style="list-style-type: none"> • Numerically Equal 	<p>How do you know which is the base and height?</p> <p>Find shapes with a perimeter of 11cm</p> <p>Draw two different rectangles with an area of 8 squares? How about 7 squares? Why is this not possible?</p> <p>Why is the area of a rectangle given by length times width?</p> <p>A shape made from two rectangles has area 10cm². Draw the shape.</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Measures <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Area and Perimeter <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L4SSM6*

LEARNING REVIEW 1



Spring Term 3 hours

Previously...

Recognise horizontal and vertical lines; describe and identify the position of a square on a grid of squares

- Read and plot coordinates in the first quadrant (Y5)
- Use coordinates in the first quadrant to draw, locate and complete shapes that meet given properties (Y6)
- Read and plot coordinates in all four quadrants

Next...

- Generate coordinate pairs that satisfy a simple linear rule; plot the graphs of simple linear functions, where y is given explicitly in terms of x , on paper and using ICT; recognise straight-line graphs parallel to the x -axis or y -axis
- Plot and interpret the graphs of simple linear functions arising from real-life situations, e.g. conversion graphs

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Gallopig Horse and teacher's version <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Shape, Space and Measures: Reflections <p>Resources</p> <ul style="list-style-type: none"> ▪ Ready drawn axes 	<p>NRICH</p> <ul style="list-style-type: none"> • Eight Hidden Squares • A Cartesian Puzzle 	<p>Coordinates: 'x is a cross, wise up'. What does this mean?! Does it help you</p> <p>Find a pair of points with a mid-point of (1,4) and another... and another</p> <p>Give me the co-ordinates of some points which can be joined to form a straight line</p> <p>Find three lines that pass through 1 on the y-axis</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Sequences, functions, graphs <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Orientation and reflection of shapes <p>APP Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L3SSM3* ▪ L4ALG2 ▪ L4SSM2 ▪ L5ALG2



Previously...

- Add or subtract mentally pairs of two-digit whole numbers (e.g. $47 + 58$, $91 - 35$) (Y4)
- Multiply and divide numbers to 1000 by 10 and then 100 (whole-number answers), understanding the effect; relate to scaling up or down (Y4)
- Derive and recall multiplication facts up to 10×10 , the corresponding division facts and multiples of numbers to 10 up to the tenth multiple (Y4)
- Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000 (Y4)
- Use knowledge of rounding, place value, number facts and inverse operations to estimate and check calculations (Y5)

- Extend mental methods for whole-number calculations, for example to multiply a two-digit by a one-digit number (e.g. 12×9), to multiply by 25 (e.g. 16×25), to subtract one near multiple of 1000 from another (e.g. $6070 - 4097$) (Y5)
- Use knowledge of place value and multiplication facts to 10×10 to derive related multiplication and division facts involving decimals (e.g. 0.8×7 , $4.8 \div 6$) (Y6)
- Calculate mentally with integers and decimals: $U.t \pm U.t$, $TU \times U$, $TU \div U$, $U.t \times U$, $U.t \div U$ (Y6)
- Use approximations, inverse operations and tests of divisibility to estimate and check results (Y6)

Next...

- Understand and use the rules of arithmetic and inverse operations in the context of positive integers and decimals
- Use the order of operations, including brackets
- Strengthen and extend mental methods of calculation to include decimals, fractions and percentages, accompanied where appropriate by suitable jottings; solve simple problems mentally
- Recall number facts, including positive integer complements to 100 and multiplication facts to 10×10 , and quickly derive associated division facts
- Check results by considering whether they are of the right order of magnitude and by working problems backwards

Spring Term 7 hours

Suggested Activities	NRICH	Criteria for Success	Level Ladders
<p><i>This unit, with the next one, is designed to take pupils through the structure of mental - jottings - written, and using calculators as and when necessary. Children should use mental approaches as a first resort to solving number calculations; then mental approaches with informal jottings, then finally written methods. See 'Approaches to calculation, some principles'</i></p> <p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Tables grid ▪ Tables jigsaw ▪ 1000 ▪ Blockbusters ▪ Higher or lower <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Estimating: v1 ▪ Multiplying & Dividing: v1, v4 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Sequences: v1 ▪ Problem Solving: v1 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Numbers and the Number System: Place value and approximations ▪ Calculating: Deriving facts from known facts <p>Resources</p> <ul style="list-style-type: none"> ▪ Place value chart, Number lines, Place value grids - cut up 100 square/ missing numbers, Diene's blocks, Cuisenaire Rods, 100 squares, HTU chart, Factors diagram, Multiplication Square 	<p>NRICH</p> <ul style="list-style-type: none"> • How Do You Do It? 	<p>A book of raffle tickets is numbered from 300 to 399. Some have been sold, in order, and the next available ticket is 343. How many have been sold? How many are there left?</p> <p>You have 44 eggs, and each egg-box can hold six eggs. How many boxes would you need? What would happen if you rounded to the nearest 10 in order to estimate a solution?</p> <p>Why do these calculations have the same answer? $16 + 9$ and $17 + 8$? $17 - 9$ and $16 - 8$? etc.</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Mental calculations ▪ Place value, rounding <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Approximating Multiplication and division I <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3NNS2* ▪ L3CALC1* ▪ L4CALC2



Previously...

- Refine and use efficient written methods to add and subtract two-digit and three-digit whole numbers and $\pounds.p$ (Y4)
- Develop and use written methods to record, support and explain multiplication and division of two-digit numbers by a one-digit number, including division with remainders (e.g. 15×9 , $98 \div 6$) (Y4)
- Use a calculator to carry out one-step and two-step calculations involving all four operations; recognise negative numbers in the display, correct mistaken entries and interpret the display correctly in the context of money (Y4)
- Use knowledge of rounding, number operations and inverses to estimate and check calculations (Y4)

• Interpret solutions in the original context and check their accuracy (Y6)

- Use knowledge of place value and addition & subtraction of two-digit numbers to derive sums & differences and doubles & halves of decimals (e.g. 6.5 ± 2.7 , half of 5.6, double 0.34) (Y5)
- Use efficient written methods to add and subtract whole numbers and decimals with up to two places (Y5)
- Refine and use efficient written methods to multiply and divide HTU \times U, TU \times TU, U.t \times U and HTU \div U (Y5)
- Use a calculator to solve problems, including those involving decimals or fractions (e.g. to find $\frac{3}{4}$ of 150 g); interpret the display correctly in the context of measurement (Y5)
- Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer (Y6)
- Use a calculator to solve problems involving multi-step calculations (Y6)

Next...

- Understand and use the rules of arithmetic and inverse operations in the context of positive integers and decimals
- Use the order of operations, including brackets
- Use efficient written methods to add and subtract whole numbers and decimals with up to two places
- Multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers
- Carry out calculations with more than one step using brackets and the memory; use the square root and sign change keys
- Enter numbers and interpret the display in different contexts (decimals, percentages, money, metric measures)
- Check results by considering whether they are of the right order of magnitude and by working problems backwards

Spring Term 7 hours

Suggested Activities		Criteria for Success	
<p>See note on previous unit</p> <p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ KPO: Palindromic Numbers ▪ Pairs in Squares <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Order of Operations: v1 ▪ Estimating: v1 ▪ Multiplying and Dividing: v1, v2, v3, v4, v5, v6 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Using a Calculator: v1, v2 ▪ Problem Solving: v1 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Calculating: Problem solving involving multiplication and division <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Calculating: Using a calculator <p>Resources</p> <ul style="list-style-type: none"> ▪ Multiplication square, Multiplication grid method / box method, Number lines - desk-based and whole-class, Times-table target chart 	<p>NRICH</p> <ul style="list-style-type: none"> • Reach 100 	<p>How did you work that out?</p> <p>Is there another way you could have worked that out?</p> <p>What happens if I change this digit to an 8, 9, ...</p> <p>Always, sometimes or never true: Finding a quarter is halving and halving again?</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Written calculations <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Number problems ▪ Checking Results <p>APP</p> <p>Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L3CALC3 ▪ L3CALC6* ▪ L4CALC3 ▪ L4CALC6*



Spring Term 6 hours

Previously...

- Draw and complete shapes with reflective symmetry; draw the reflection of a shape in a mirror line along one side (Y3)
- Draw polygons and classify them by identifying their properties, including their line symmetry (Y4)

- Complete patterns with up to two lines of symmetry; draw the position of a shape after a reflection or translation (Y5)
- Visualise and draw on grids of different types where a shape will be after reflection, after translations, or after rotation through 90° or 180° about its centre or one of its vertices (Y6)
- Transform 2-D shapes by reflecting in given mirror lines
- Explore these transformations and symmetries using ICT

Next...

- Understand and use the language and notation associated with reflections, translations and rotations
- Recognise and visualise the symmetries of a 2-D shape
- Transform 2-D shapes by:
 - rotating about a given point;
 - translating.
- Explore these transformations and symmetries using ICT

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Rangoli Patterns ▪ Lines of symmetry in polygons and mark-scheme ▪ Use pattern blocks to make shapes with 'x' lines of symmetry <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Shape, Space and Measures: Describing movement <p>Resources</p> <ul style="list-style-type: none"> ▪ 3x3, 4x4, 5x5 dotty paper 		<p>Make a polygon which is symmetrical but not regular</p> <p>Draw a hexagon with 6 / 3 / 2 / 1 / 0 lines of symmetry. Why can't you draw one with 4 / 5 lines of symmetry?</p> <p>How many lines of symmetry can a quadrilateral have?</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Transformations ▪ Geometrical reasoning <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Position and movement <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3SSM4* ▪ L4SSM3



Previously...

- Answer a question by identifying what data to collect; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts, using ICT where appropriate (Y4)
- Compare the impact of representations where scales have intervals of differing step size (Y4)
- Find and interpret the mode of a set of data (Y5)

- Construct frequency tables, pictograms and bar and line graphs to represent the frequencies of events and changes over time (Y5)
- Construct and interpret frequency tables, bar charts with grouped discrete data, and line graphs; interpret pie charts (Y6)
- Describe & interpret results & solutions to problems using the mode, range, median & mean (Y6)

Next...

- Calculate statistics for small sets of discrete data:
 - (i) find the mode, median and range, and the modal class for grouped data
 - (ii) calculate the mean, including from a simple frequency table, using a calculator for a larger number of items
- Construct, on paper and using ICT, graphs and diagrams to represent data, including:
 - (i) bar-line graphs
 - (ii) frequency diagrams for grouped discrete data
 - (iii) simple pie charts
- Interpret diagrams and graphs (including pie charts), and draw simple conclusions based on the shape of graphs and simple statistics for a single distribution

Spring Term 7 hours

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Cuisenaire averages ▪ Averages ▪ 5 pupils with a whiteboard; order numbers for median; which number is representative? ▪ Multilink columns, adjust the heights to find mean <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Comparing Statistics: v1 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Handling Data: v2 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Handling Data: Bar charts and pictograms <p>Resources</p> <ul style="list-style-type: none"> ▪ <i>Cuisenaire rods (averaging physical / visual resources to demonstrate even distribution of values for the mean)</i> ▪ <i>Multilink cubes</i> 	<p>NCETM Departmental Workshops</p> <ul style="list-style-type: none"> ▪ Statistical Data <p>NRICH</p> <ul style="list-style-type: none"> • Match the Matches 	<p>What does average mean?</p> <p>Why do we have more than one way of working out an average?</p> <p>Can the average be bigger than the largest number?</p> <p>Can an average be the same as the largest number?</p> <p>How can we represent a group of numbers, with a single number?</p> <p>Any possibilities using Averages</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Processing, representing and interpreting data <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Bar charts and pictograms <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3HD2* ▪ L4HD4 ▪ L4HD5



Previously...

- Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols (Y4)
- Solve one- and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate (Y4)
- Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples (Y4)

- Solve one-step and two-step problems involving whole numbers and decimals and all four operations, choosing and using appropriate calculation strategies, including calculator use (Y5)
- Represent a puzzle or problem by identifying and recording the information or calculations needed to solve it; find possible solutions and confirm them in the context of the problem (Y5)
- Explore patterns, properties and relationships and propose a general statement involving numbers or shapes; identify examples for which the statement is true or false (Y5)
- Tabulate systematically the information in a problem or puzzle; identify and record the steps or calculations needed to solve it, using symbols where appropriate; interpret solutions in the original context and check their accuracy (Y6)

Next...

- Know the meanings of the words term, expression and equation
- Construct and solve simple linear equations with integer coefficients (unknown on one side only) using an appropriate method (e.g. inverse operations)

Suggested Activities		Criteria for Success	
<p><i>Note that the main intended focus for this problem-solving unit is to concentrate on the use of symbols to represent problems. In particular, learners should work towards representing 'missing number' problems as equations</i></p> <p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ The domino trick <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Algebra: v1 ▪ Order of Operations: v1 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Algebraic Equations: v1 <p>Resources</p> <ul style="list-style-type: none"> ▪ <i>Pack of cards (for think of a number problems)</i> 	<p>NCETM Departmental Workshops</p> <ul style="list-style-type: none"> ▪ Mathematical Processes and Applications <p>NRICH</p> <ul style="list-style-type: none"> • Counting Cards • Up and Down Staircases • Magic Vs • Sealed Solution • Prison Cells • Money Bags • Amy's Dominoes 	<p>What is different about the two statements here: $x + 7 = 12$ and $x + y = 15$?</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Equations, formulae, identities <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3UA2 ▪ L3UA3 ▪ L4UA1 ▪ L4UA3

LEARNING REVIEW 2



Previously...

- Use diagrams to identify equivalent fractions (e.g. $\frac{6}{8}$ and $\frac{3}{4}$, or $\frac{70}{100}$ and $\frac{7}{10}$); interpret mixed numbers and position them on a number line (e.g. $3\frac{1}{2}$) (Y4)
- Find fractions using division (e.g. $\frac{1}{100}$ of 5 kg), and percentages of numbers and quantities (e.g. 10%, 5% and 15% of £80) (Y5)
- Express a smaller whole number as a fraction of a larger one (e.g. recognise that 5 out of 8 is $\frac{5}{8}$); find equivalent fractions (e.g. $\frac{7}{10} = \frac{14}{20}$, or $\frac{29}{10} = \frac{58}{20}$); relate fractions to their decimal representations (Y5)
- Understand percentage as the number of parts in every 100 and express tenths and hundredths as percentages (Y5)

- Use decimal notation for tenths, hundredths and thousandths; partition, round and order decimals with up to three places, and position them on the number line
- Relate fractions to multiplication and division (e.g. $6 \div 2 = \frac{1}{2}$, of $6 = 6 \times \frac{1}{2}$); express a quotient as a fraction or decimal (e.g. $67 \div 5 = 13.4$ or $\frac{332}{25}$); find fractions and percentages of whole-number quantities (e.g. $\frac{5}{8}$ of 96, 65% of £260) (Y6)
- Express a larger whole number as a fraction of a smaller one (e.g. recognise that 8 slices of a 5-slice pizza represents $\frac{8}{5}$, or $1\frac{3}{5}$ pizzas); simplify fractions by cancelling common factors; order a set of fractions by converting them to fractions with a common denominator (Y6)
- Express one quantity as a percentage of another (e.g. express £400 as a percentage of £1000); find equivalent percentages, decimals and fractions (Y6)

Next...

- Express a smaller whole number as a fraction of a larger one; simplify fractions by cancelling all common factors and identify equivalent fractions; convert terminating decimals to fractions, e.g. $0.23 = \frac{23}{100}$; use diagrams to compare two or more simple fractions
- Add and subtract simple fractions and those with common denominators; calculate simple fractions of quantities and measurements (whole-number answers); multiply a fraction by an integer
- Understand percentage as the 'number of parts per 100'; calculate simple percentages and use percentages to compare simple proportions
- Recognise the equivalence of percentages, fractions and decimals

Summer Term 9 hours

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Fraction Action ▪ FDP carpets ▪ Fraction OHTs ▪ 60cm number line ▪ Easy decimal ordering cards ▪ Count on & back in halves, fifths & quarters, & in steps of 0.1 & 0.01 or in fractions, decimals & percentages (using stick) <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Simplifying Fractions: v1, v2 ▪ Fractions, Decimals & Percentages: v1, v2 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Numbers and the Number System: Simple fractions <p>Resources</p> <ul style="list-style-type: none"> ▪ Spider diagram – e.g. fractions of 40 or 60 ▪ Fractions images ▪ Multiplication squares ▪ Counting stick ▪ Use fraction walls / Cuisenaire to compare fractions; Extend to comparing those with common denominators – e.g. $\frac{3}{4}$ or $\frac{4}{5}$? ▪ Cuisenaire rods ▪ Washing line / pegs to place fractions between 0 and 1, or 0 and 10 	<p>NRICH</p> <ul style="list-style-type: none"> • Chocolate • Andy's Marbles • Would you Rather? • Forgot the Numbers 	<p>Number line fractions: where should I place $\frac{3}{4}$? What tells you that it is greater than $\frac{1}{2}$? Which side of $\frac{3}{4}$ is $\frac{5}{6}$? Where is $\frac{8}{7}$?</p> <p>Show this fraction as part of a square / rectangle / number line</p> <p>Explain mental methods for finding common percentages of a quantity – e.g. 10%, 5%, 20% etc</p> <p>How many different ways can you shade a 2×3 rectangle of squares to show $\frac{1}{3}$?</p> <p>Use multilink cubes to make some cuboids that show $\frac{1}{3}$. Can this be done with all cuboids?</p> <p>Find six fractions equivalent fractions to ____</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Fractions ▪ Mental calculations ▪ Percentages <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Fractions <p>APP</p> <p>Look for learners doing:</p> <ul style="list-style-type: none"> ▪ L3NNS4* ▪ L4NNS4 ▪ L4NNS5



Previously...

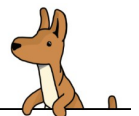
- Read timetables and time using 24-hour clock notation; use a calendar to calculate time intervals (Y5)
- Read, choose, use and record standard metric units to estimate and measure length, weight and capacity to a suitable degree of accuracy (e.g. the nearest centimetre); convert larger to smaller units using decimals to one place (e.g. change 2.6 kg to 2600 g) (Y5)
- Interpret a reading that lies between two unnumbered divisions on a scale (Y5)

- Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa) (Y6)
- Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments (Y6)

Next...

- Convert one metric unit to another, e.g. grams to kilograms; read and interpret scales on a range of measuring instruments
- Distinguish between and estimate the size of acute, obtuse and reflex angles

Suggested Activities		Criteria for Success
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ Walk 1000 metres. Compare 1000 paces with 1000 metres. <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ <u>Metric Units</u>: v1, v2 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ <u>Shape, Space and Measures</u>: Measures <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ <u>Shape, Space and Measures</u>: Interpreting scales <p>Resources</p> <ul style="list-style-type: none"> ▪ <i>Sets of scales</i> ▪ <i>Measuring jugs</i> 		<p>What unit would you use to measure_____?</p> <p>Show me 3 masses (in grams) with a total of 1kg, where all the masses are greater than 200g</p> <p>True/Never/Sometimes: Large containers have a greater capacity than small ones</p> <p>Show me i) an acute angle ii) an obtuse angle</p> <p>What is the same/different about: Drawing a line, drawing an angle</p> <p>Convince me how you decide what each division on the scale represents.</p> <p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Measures <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Measures ▪ Interpreting Measurements <p>APP <i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3SSM5* ▪ L4SSM5* ▪ L5SSM5



Previously...

- Find fractions of numbers, quantities or shapes (e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle) (Y4)
- Use decimal notation for tenths and hundredths and partition decimals; relate the notation to money and measurement; position one-place and two-place decimals on a number line
- Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths

Identify and record the steps or calculations needed to solve a problem or puzzle (Y6)

- Use understanding of place value to multiply and divide whole numbers and decimals by 10, 100 or 1000 (Y5)
- Explain what each digit represents in whole numbers and decimals with up to two places, and partition, round and order these numbers (Y5)
- Use decimal notation for tenths, hundredths and thousandths; partition, round and order decimals with up to three places, and position them on the number line (Y6)
- Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use (Y6)

Next...

- Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1000, and explain the effect
- Compare and order decimals in different contexts; know that when comparing measurements the units must be the same
- Round positive whole numbers to the nearest 10, 100 or 1000, and decimals to the nearest whole number or one decimal place
- Use the order of operations, including brackets
- Strengthen and extend mental methods of calculation to include decimals, fractions and percentages, accompanied where appropriate by suitable jottings; solve simple problems mentally
- Multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers
- Check results by considering whether they are of the right order of magnitude and by working problems backwards

Summer Term 5 hours

Suggested Activities	NRICH	Criteria for Success	Criteria for Success
<p><i>Ensure progression from the previous 'calculation and checking' units in the spring term</i></p> <p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ KPO: 1, 2, 3, 4 - extend to as many numbers between 1 and 100 as can be found ▪ Up or Down <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Mental Maths: v1, v2 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Place Value: v1, v2 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Calculating: Multiplying and dividing <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> • Numbers and the Number System: Place value <p>Resources Place value chart, Number lines, Decimal ordering cards, HTU chart, Gattegno charts, Diene's blocks, Multiplication squares, Division using the number line</p>	<p>NRICH</p> <ul style="list-style-type: none"> • Two Primes Make One Square • What's it Worth? 	<p>What is the quick way to multiply and divide by 4, 8, 16, 32?</p> <p>Show me an example of a number when you divide by 5 gives a remainder of 1</p> <p>What's wrong: $19 \div 3 = 6.1$</p> <p>Show me:</p> <ul style="list-style-type: none"> ▪ a number when multiplied by 10 gives an answer greater than 350 ▪ a number when divided by 100 gives an answer less than 20 <p>True / Never / Sometimes:</p> <ul style="list-style-type: none"> ▪ To multiply by 100, you move the digits two places to the left ▪ To multiply by 100, you move the digits two places to the right ▪ To divide by 100, you move the digits two places to the left ▪ To divide by 100, you move the digits two places to the right ▪ To divide by 100, you move the decimal point two places to the left ▪ To divide by 100, you move the decimal point two places to the right <p>What is the same/different about 46×10, $4600 \div 10$, 46×100 and $4600 \div 100$</p> <p>Convince me:</p> <ul style="list-style-type: none"> ▪ that $7900 \div 10 = 790$ ▪ that $250 \div 10$ and $2500 \div 100$ give the same answer. ▪ how to multiply a number by 10. ▪ how to divide a number by 100. 	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Place value, rounding ▪ Mental calculations ▪ Written calculations <p>Beyond the Classroom</p> <ul style="list-style-type: none"> ▪ Multiplication and division II ▪ Place Value <p>APP <i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3CALC4* ▪ L4NNS3* ▪ L4CALC1 ▪ L4CALC4



Previously...

- Visualise 3-D objects from 2-D drawings; make nets of common solids (Y4)
- Recognise horizontal and vertical lines; use the eight compass points to describe direction; describe and identify the position of a square on a grid of squares (Y4)
- Read and plot coordinates in the first quadrant (Y5)

• **Represent and interpret sequences, patterns and relationships involving shapes (Y6)**

- Identify, visualise and describe properties of rectangles, triangles, regular polygons and 3-D solids; use knowledge of properties to draw 2-D shapes and identify and draw nets of 3-D shapes (Y5)
- Estimate, draw and measure acute and obtuse angles using an angle measurer or protractor to a suitable degree of accuracy; calculate angles in a straight line (Y5)
- Describe, identify and visualise parallel and perpendicular edges or faces; use these properties to classify 2-D shapes and 3-D solids (Y6)
- Use coordinates in the first quadrant to draw, locate and complete shapes that meet given properties (Y6)
- Use 2-D representations to visualise 3-D shapes and deduce some of their properties

Next...

- Use conventions and notation for 2-D coordinates in all four quadrants; find coordinates of points determined by geometric information
- Calculate the surface area of cubes and cuboids

Suggested Activities		Criteria for Success	
<p>Maths Apprentice</p> <ul style="list-style-type: none"> ▪ 3x3, 4x4, 5x5 <i>dotty paper activities</i> ▪ Classify quadrilaterals according to the relationship between their diagonals / angles / sides ▪ KPO: Shape work: Circle ▪ A 3D World <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> ▪ Lines and Angles: v3 <p>KS3 Top-up Bring on the Maths</p> <ul style="list-style-type: none"> • Lines and Angles: v2 <p>Resources</p> <ul style="list-style-type: none"> ▪ 3x3, 4x4, 5x5 <i>dotty paper</i> 	<p>NRICH</p> <ul style="list-style-type: none"> • Square It • Cut Nets • Egyptian Rope • Where Are They? 	<p>Which polyhedra are made from a single kind of polygon? [Platonic Solids]</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> ▪ Construction, loci ▪ Geometric reasoning <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> ▪ L3SSM3 ▪ L4SSM1 ▪ L4SSM3 ▪ L5SSM4



Previously...

- Plan and pursue an enquiry; present evidence by collecting, organising and interpreting information; suggest extensions to the enquiry

- Suggest and test hypotheses (Y6)**
- Suggest, plan and develop lines of enquiry; collect, organise and represent information, interpret results and review methods; identify and answer related questions (Y6)**
- Answer a set of related questions by collecting, selecting and organising relevant data; draw conclusions, using ICT to present features, and identify further questions to ask (Y5)
- Suggest and test hypotheses (Y6)
- Solve problems by collecting, selecting, processing, presenting and interpreting data, using ICT where appropriate; draw conclusions and identify further questions to ask (Y6)
- Suggest, plan and develop lines of enquiry; collect, organise and represent information, interpret results and review methods; identify and answer related questions (Y6)

Next...

- Suggest possible answers, given a question that can be addressed by statistical methods
- Decide which data would be relevant to an enquiry and possible sources
- Plan how to collect and organise small sets of data from surveys and experiments:
 - design data collection sheets or questionnaires to use in a simple survey
 - construct frequency tables for gathering discrete data, grouped where appropriate in equal class intervals
- Collect small sets of data from surveys and experiments, as planned
- Compare two simple distributions using the range and one of the mode, median or mean
- Write a short report of a statistical enquiry, including appropriate diagrams, graphs and charts, using ICT as appropriate; justify the choice of presentation

Summer Term 7 hours

Suggested Activities		Criteria for Success	
<p><i>The aim of the project is: Write a short report of a statistical enquiry and illustrate with appropriate diagrams, graphs and charts, using ICT as appropriate; justify the choice of what is presented. Refer to the previous handling data unit for guidance on appropriate techniques.</i></p> <p>Maths Apprentice</p> <ul style="list-style-type: none"> KPO: This data handling project should involve pupils making hypotheses, collecting data, representing their collected information and interpreting it with reference to the hypotheses stated <p>Y7 Bring on the Maths</p> <ul style="list-style-type: none"> Comparing Statistics: v1 <p>Level 3 Bring on the Maths</p> <ul style="list-style-type: none"> Handling Data: Gathering information <p>Level 4 Bring on the Maths</p> <ul style="list-style-type: none"> Handling Data: Recording data 	<p>NRICH</p> <ul style="list-style-type: none"> Real Statistics It's a Tie 	<p>Concentrate on <i>interpretation</i> as a key element of the project; relating outcomes directly with the hypothesis being tested.</p> <p>Show me how we could record this data</p> <p>Show me how we could represent this data</p> <p>True/Never/Sometimes: The best way to collect information is to ask your friends</p>	<p>Level Ladders</p> <ul style="list-style-type: none"> Processing, representing and interpreting data <p>Beyond the Classroom</p> <ul style="list-style-type: none"> Gathering information Discrete Data <p>APP</p> <p><i>Look for learners doing:</i></p> <ul style="list-style-type: none"> L3HD1* L4HD1* L4HD2 L5HD1

LEARNING REVIEW 3

