**Maths**

**YEAR 9**

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| **SOW** | **Forming and solving equations** | **Straight line graphs** | **Testing conjecture** | **3D shapes** |
| **Knowledge** | 1. Literacy Pre Teach Solve one and two step equations including with brackets.
2. Solve one and two step inequalities including with brackets.
3. Solve inequalities with negative numbers.
4. Solve equations with unknowns on both sides.
5. Solve inequalities with unknowns on both sides
6. Forming and solving equations and inequalities
7. Forming and solving equations and inequalities.
8. Rearrange formulae one step.
9. Rearrange formulae two step.

(Depth) – rearranging more complex formulae  | 1. Literacy Pre Teach Lines parallel to the axes. Using a table of values.
2. Compare gradients and intercepts
3. Understand y = mx + c
4. Write in the form y = mx + c
5. Equation of a line from a graph
6. Equation of a line from a graph
7. Gradient/intercept real-life graphs

Depth)  *Model inverse real-life graphs. Explore perpendicular lines* | 1. Literacy Pre Teach Factors, multiples and primes. True or false.
2. Always, sometimes, never true
3. Show that
4. Explore the 100 grid
5. Conjectures with algebra
6. Expand a pair of binomials
7. Expand a pair of binomials. *Expand three binomials.*
 | 1. Literacy Pre Teach Know names of 2D and 3D shapes. Recognise prisms (including language – vertices, edges and faces)
2. Accurate nets of cuboids and other 3D shapes. Sketch and recognise nets of cuboids and other 3D shapes.
3. Plans and elevations
4. Area of 2D shapes
5. Surface area of cubes and cuboids
6. Surface area of triangular prisms
7. Surface area of a cylinder
8. Volume of cubes and cuboids
9. Volume of prisms and cylinders

(Depth) Volume or cones, pyramids and spheres.  |
| **Skills**  |
| **Vocabulary** | Equation, Inequality, Solution, Unknown, Inverse, Solve, Expand, Satisfy, Reverse, Balance, Coefficient, Variable, Formula, Substitute, Rearrange, Make subject of. | Parallel, Horizontal, Vertical, Straight line, Axis, Equation, Intercept, Linear, Function, Gradient, Slope, Positive, Negative, Coordinate, y-intercept, Perpendicular, reciprocal. | Factor, Multiple, Prime, Common, Odd, Even, Express, True, False, Verify, counterexample, Conjecture, Demonstrate, Prove, Show that. | Dimensions, Cube/cuboid, Cylinder, Cone, Sphere, Pyramid, Tetrahedron, Face, Edge, Vertex, Polygon, Prism, Cross-Section, Net, Area, Plan, Front/side Elevation, Perspective, Solid, Perpendicular, Units. |
| **Does the knowledge above marry up with KO? If not, what needs to be amended?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. |
| **How does this knowledge link to/build on prior knowledge?** | Solving equations (one and two step)Know and use the inequality signsSolve inequalities (one and two step) | Plotting simple straight line graphsUnderstand a linear relationshipLines parallel to the axesRecognise y=x and y= -xSubstitution Use a table of values  | Prime NumbersFactors Multiples FractionsPercentages DecimalsEquivalence of fraction, percentages and decimals Inequality sign | Names of common 2D and 3D shapes.Properties of 2D shapes.Area of a rectangle.Units for measuring area and volume.  |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes | Yes | Yes |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes |

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| **SOW** | Number | Deduction | Pythagoras’ theorem | Using percentages |
| **Knowledge** | 1. Literacy Pre Teach Integers, real numbers and rational numbers (include surds, if possible)
2. Solve problems with integers and decimals
3. Add and subtract fractions
4. Multiply and divide fractions
5. Solve problems with fractions
6. Numbers in standard form
7. Numbers in standard form
 | 1. Literacy Pre Teach Finding missing angles in parallel lines (r)
2. Solve multi step missing angle problems
3. Solve angle problems involving algebra
4. Address conjectures with angles including clear well written explanations
5. Address conjecture with shapes with reasons
6. Link constructions and geometry reasoning (Depth)
 | 1. Literacy Pre Teach Square and square roots (perhaps cover in Do Now). Identify the hypotenuse.
2. Exploring Pythagoras. Determining whether a triangle is right-angled.
3. Calculate the hypotenuse
4. Calculate missing sides
5. Pythagoras’ theorem on coordinate axes
 | 1. Literacy Pre Teach Calculate percentage increase and decrease (using multipliers)
2. Calculate percentage change
3. Reverse percentage problems
4. Non-calculator percentage problems
5. Calculator percentage problems
6. Repeated percentage change
7. Repeated percentage change
 |
| **Skills**  |
| **Vocabulary** | Integer, Real, Rational, Irrational, Root, Square root, Cube root, Surd, Simplify, Positive, Negative, Directed, Inverse, Square, Cube, Operation, Integer, Quotient, Product, Sum, Difference, Decimal, Common factor/multiple, HCF/LCM, Product of primes, Fractions, Numerator, Denominator, Mixed numbers, Common denominator, Improper fraction | Alternate, Corresponding, Construct, Sum, Co-interior, Transversal, Parallel, Regular, Angles at a point, Polygon, Interior, Exterior, Perpendicular | square, square-root, integer, significant figures, decimal places, hypotenuse, right angled triangle, opposite, adjacent, sum, line segment, gradient, quadrant, diagonal, cuboid  | Fraction, Decimal, Percentage, Convert, Equivalent, Increase, Decrease, Reduce, Multiplier, Profit, Loss, Original, Change, Increase, Decrease, Reverse, Repeated, Depreciate.  |
| **Does the knowledge above marry up with KO? If not, what needs to be amended?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. |
| **How does this knowledge link to/build on prior knowledge?** | FactorsMultiplesWritten methods for four operationsSquare rootSquare numbers Product of primesReciprocalMixed NumberImproper Fraction | Basic angle facts Addition and subtraction Solving equations Forming equations. | Square Numbers Square RootsRight-angled triangle Plot coordinates  | Equivalent fractionsBasic percentages (10% / 25% / 50%)Percentage increase / decrease  |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes | Yes | Yes |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes |

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| **SOW** | Maths and Money | Rotation, translation and enlargement | Solving ratio and proportion problems | Rates | Probability |
| **Knowledge** | 1. Literacy Pre Teach Bills and bank statements
2. Value added tax
3. Wages and taxes
4. Exchange rates
5. Unit pricing
6. Simple interest
7. Compound interest
8. Compound interest
 | 1. Literacy Pre Teach Reflection – recognise line symmetry and reflect in a vertical or horizontal line (refer to year 8 unit)
2. Reflection – reflect in a vertical, horizontal or diagonal line (refer to year 8 unit)
3. Rotational symmetry – identify rotational symmetry. Compare and contrast rotational symmetry with lines of symmetry.
4. Rotate a shape – from a point on a shape and away from a shape
5. Translation – introduce vectors and begin to translate points
6. Translate shapes
7. Recognise enlargement and similarity. Positive integer scale factors.
8. Enlarge a shape from a point.
9. Positive fractional scale factor.
 | 1. Literacy Pre Teach Solve problems with direct proportion.
2. Direct proportion and conversion graphs.
3. Solve problems with inverse proportion.
4. Solve ratio problems given the whole or part
5. Solve ‘best buy’ problems
 | 1. Literacy Pre Teach Solve speed, distance, time (Non-calculator)
2. Solve speed, distance, time (Calculator)
3. Interpret distance-time graphs
4. Density, mass and volume
5. Density, mass and volume
6. Flow problems and their graphs
7. Rates of change and their units
 | 1. Literacy Pre Teach Single event probability (May be covered in Do Now’s in previous blocks to avoid revisit)
2. Relative frequency
3. Expected outcomes
4. Independent events and sample space
5. Two-way table
6. Venn diagrams (refer to y7 block)
7. Venn diagrams (refer to y7 block)
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| **Skills**  |
| **Vocabulary** | Total, Debit, Credit, Balance Expense, Bill, Percentage, Interest, Overtime, Deposit, Wages, Rate, Currency, Exchange | Shape, rotational, symmetry, regular, irregular, line, mirror, invariant, clockwise, anticlockwise, centre, translate, vector, move, vertex, vertical, horizontal, similar, ratio, enlargement, scale factor | ratio, multiplier, constant, scale factor, graph, relationship, variable, linear, gradient, inverse, proportional, divide, share, equal parts, equivalent | Speed, Distance, Time, Per, Hours, Minutes, Convert, Rounding, Accuracy, Average, gradient, Axes, Origin, Density, Mass, Volume, Units, Substitute, Rearrange, Constant rate, Straight line, Curve, Flow rate, Prism, Rate of change, Conversions, Imperial, Metric | Event, Outcome, Equally likely, Probability, Biased/unbiases, Fair, Experiment, Trial, Frequency, Relative frequency, Expected, Product, Affect, Independent, At least one, Replacement, Venn diagram, Intersection, Union, Sample space, Two-way table |
| **Does the knowledge above marry up with KO?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. |
| **How does this knowledge link to/build on prior knowledge?** | Finding a percentagePercentage increase / decreaseConversion between units (£ / pence)Mental maths methods | Interpret coordinates from four quadrants. Plot coordinates accurately within four quadrants.  | Ratio bar modelling Best buyScale factorMultiplier Linear  | Understanding of speed, distance, time.Relationship between two quantities can be fraction and ratio.  | Probability scale. Understand how to calculate probability of a single and combined event. Probability is between 0 and 1. |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes | Yes | Yes | Yes |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes | Yes |

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| **SOW** | Algebraic representation |  |  |  |  |
| **Knowledge** | 1. Literacy Pre Teach Recap on basic angle rules – straight line, around a point, triangle, vertically opposite
2. Angles in parallel lines
3. Angels in parallel lines
4. Solving angle problems
5. Angle problems with algebra
6. Conjectures with angles
7. Conjectures with shape
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| **Skills**  |
| **Vocabulary** | Quadratic, Parabola, Curve, Vertex, Turning point, Symmetry, Reciprocal, Exponential, Piece-wise, Discontinuous, Simultaneous, Solution, Intersection, Satisfy, Inequality, Solution set, Test points, Included/excluded |  |  |  |  |
| **Does the knowledge above marry up with KO?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. |
| **How does this knowledge link to/build on prior knowledge?** | Angles on a straight-line sum to 180. Angles around a point sum to 360. Vertically opposite angles are equal.Know the definition of regular.  |  |  |  |  |
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| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes | Yes |