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| **Year 9 Curriculum Overview [2023-2024]****Mathematics** |
| **Autumn Term** |
|  **Autumn Term** | **Knowledge & Understanding** | **Literacy Skills****Opportunities for****developing** **literacy skills** | **Employability Skills****[if any]** | **Assessment Opportunities** |
| **Composites** | **Components****[KEY concepts & subject specific vocab]** | **Formal Retrieval****[if any]** |
| **HT1** | **Reasoning with Algebra**Straight line graphs  | * R - Lines, parallel to the axes, y=x and y=-x
* Using table of values
* Compare gradients
* Compare intercepts
* Understand and use y=mx+c
* Write an equation in the form y=mx+c
* Find the equation of a line from a graph
* Interpret gradient and intercepts of real-life graphs
* Model real-life graphs involving inverse proportion (H)
* Explore perpendicular lines (H)
 | * Retrieval in class starter
* Prior knowledge whiteboard questions
* End of Topic Unit Test Intervention lessons using knowledge organiser material
 | * Key Vocabulary in Retrieval starters
* True and False Tasks
* Problem Solving Tasks
* Blooms Questioning Tasks
 | * Personal skills- Thinking and problem solving- Working together and communicating
* Fundamental skills- Using numbers effectively- Using language effectively
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* Peer and self-assessment
* Feedback and reflective practise
* End of Topic Tests
* End of Term Tests
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|  | **Reasoning with Algebra**Forming and solving equations | * R - Solve one and two-step equations and inequalities
* R - Solve one and two-step equations and inequalities with brackets
* Inequalities with negative numbers
* Solve equations with unknowns on both sides
* Solve inequalities with unknowns on both sides
* Solving equations and inequalities in context
* Substituting into formulae and equations
* Rearranging formulae (one-step)
* Rearranging formulae (two-step)
* Rearrange complex formulae including brackets and squares (H)
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End of Term Tests |
|  | **Reasoning with Algebra**Testing Conjectures | * R - Factors, multiples and primes
* True or false
* Always, sometimes, never true
* Show that
* Conjectures about number
* Expand a pair of binomials
* Conjectures with algebra
* Explore the 100 grid
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| **HT2** | **Constructing in 2 and 3 dimensions**Three dimensional shapes | * Know names of 2-D and 3-D shapes
* Recognise prisms
* Accurate nets of cuboids and other 3-D shapes
* sketch and recognise nets of cuboids and other 3-D shapes
* plans and elevations
* R - Find area of 2-D shapes
* Surface area of cubes and cuboids
* surface area of triangular prisms
* surface area of a cylinder
* volume of cubes and cuboids
* Volume of other 3-D shapes - prisms and cylinders
* Explore volumes of cone, pyramids and spheres (H)
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End of Term Tests |
|  | **Constructing in 2 and 3 dimensions**Construction and congruency | * R - draw and measure angles
* R - construct and interpret scale drawings
* Locus of distance from a point
* Locus of distance from a straight line/shape
* Locus of points equidistant from two points
* construct a perpendicular bisector
* Construct a perpendicular from a point
* Construct a perpendicular to a point
* Locus of distance from two lines
* Construct an angle bisector
* R - Construct triangles from given information
* Identify congruent figures
* Explore congruent triangles
* Identify congruent triangles
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|  | **Reasoning with Number**Numbers | * Integers, real and rational numbers
* Understand and use surds (H)
* R - Work with directed number
* Solve problems with integers
* Solve problems with decimals
* R - HCF and LCM
* R - Adding and subtracting fractions
* R - Multiplying and dividing fractions
* Solving problems with fractions
* R - Numbers in standard form
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| **Spring term** |
| **Spring****Term** | **Knowledge & Understanding** | **Literacy Skills****Opportunities for****developing** **literacy skills** | **Employability Skills****[if any]** | **Assessment Opportunities** |
| **Composites** | **Components****[KEY concepts & subject specific vocab]** | **Formal Retrieval****[if any]** |
| **HT3** | **Reasoning with Number**Using Percentages | * R - Use the equivalence of fractions, decimals and percentages
* R - Calculate percentage increase and decrease
* R - Express a change as a percentage
* Solve 'reverse' percentage problems
* Recognise and solve percentage problems (non-calc)
* R - Recognise and solve percentage problems (calc)
* Solve problems with repeated percentage change (H)
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|  | **Reasoning with Number**Maths and Money | * Solve problems with bills and bank statements
* Calculate simple interest
* Calculate compound interest
* Solve problems with VAT
* Calculate wages and taxes
* Solve problems with exchange rates
* Solve unit pricing problems
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| **HT4** | **Reasoning with Geometry**Deductions | * R - Angles in parallel lines
* Solving angles problems (using chains of reasoning)
* Angles problems with algebra
* Conjectures with angles
* Conjectures with shapes
* Link constructions and geometrical reasoning
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|  | **Reasoning with Geometry**Rotation and translation | * Identify the order of rotational symmetry of a shape
* Compare and contrast rotational symmetry with line symmetry
* Rotate a shape about a point on a shape
* Rotate a shape about a point not on a shape
* Translate points and shapes by a given vector
* Compare rotation and reflection of shapes
* Find the result of a series of transformations
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|  | **Reasoning with Geometry**Pythagoras | * R - Squares and square roots
* Identify the hypotenuse of a right-angled triangle
* Determine whether a triangle is right angled
* Calculate the hypotenuse of a right-angled triangle
* Calculate missing sides in right-angled triangles
* Use Pythagoras' theroem on coordinate axes
* Explore proofs of Pythagoras' theorem
* Use Pythagoras' theorem in 3-D shapes
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| **Summer term** |
| **Summer** **Term** | **Knowledge & Understanding** | **Literacy Skills****Opportunities for****developing** **literacy skills** | **Employability Skills****[if any]** | **Assessment Opportunities** |
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| **HT5** | **Reasoning with Proportion**Enlargement and similarity | * Recognise enlargement and similarity
* Enlarge a shape by a positive integer scale factor
* Enlarge a shape by a positive integer scale factor from a point
* Enlarge a shape by a positive **fractional** scale factor
* Enlarge a shape by a negative scale factor
* Work out missing sides and angles in a pair of given similar shapes
* Solve problems with similar triangles
* Explore ratios in right-angled triangles
 | * Retrieval in class starter
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|  | **Reasoning with Proportion**Solving ratio and proportion questions. | * R - Solve problems with direct proportion
* R - Direct proportion and conversion graphs
* Solve problems with inverse proportion
* Graphs of inverse relationships
* R - Solve ratio problems given the whole or part
* Solve 'best-buy' problems
* Solve problems ratio and algebra
 | * Retrieval in class starter
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|  | **Reasoning with Proportion**Rates | * Know and use mental addition and subtraction
* Solve speed, distance and time problems without a calculator
* Solve speed, distance and time problems with a calculator
* Use distance/time graphs
* Solve problems with density, mass and volume
* Solve flow problems and their graphs
* Rates of change and their units
* Convert compound units(H)
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| **HT6** | **Representation**Probability | * R - Single event probability
* Relative frequency - include convergence
* Expected outcomes
* Independent events
* Use tree diagrams (H)
* Use tree diagrams to solve 'without replacement' problems(H)
* Use tree diagrams to work out probabilities
 | * Retrieval in class starter
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|  | **Representation**Algebraic representation | * Draw and interpret quadratic graphs
* Interpret graphs, including reciprocal and piece-wise
* Investigate graphs of simultaneous equations
* Represent inequalities
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