Maths / Year 9 Foundation / Academic Year 2022 - 2023

THE OLDHAM ACADEMY NORTH

Year 9 - Foundation	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Curriculum Content	**Composite: Number** **Component 1: Number problems and reasoning** **Component 2: Decimals** Adding and subtracting decimals Multiplying and dividing decimals **Component 3: Rounding and estimation** Rounding to decimal places and significant figures Making estimates of calculations **Component 4: Place Value** Writing numbers Estimate calculations **Component 5: Calculating with powers** Squares, Roots and Cubes Number index laws **Component 6: Factors, Multiples and Primes** Highest Common Factor (HCF) Lowest Common Multiple (LCM) Prime factor decomposition Venn Diagram for HCF and LCM Applying HCF and LCM to solve problems	**Composite: Algebra** **Component 1: algebraic notation** Simplifying by collecting like terms Forming an expression Algebraic Index laws Substitution **Component 2: Expanding and Factorising** Expanding linear brackets Factorising linear expressions **Component 3: Formulae** Applying formulae and expressions from other subjects **Composite 2: Graphs Tables and Charts** **Component 1: read statistical diagrams** Grouped frequency table Data collection sheets Time Tables Distance Charts **Component 2: Draw statistical diagrams** Two-way tables Comparative bar charts Composite bar charts	**Composite 1: Graphs Tables and Charts** **Component 1: construct statistical diagrams** Line graphs Time series graph Frequency Polygons Scatter graphs **Component 2: construct and read statistical diagrams** Stem and leaf diagram (back to back) Pie charts Equal class width histograms **Component 3: more statistical diagram** Choosing suitable graphs **Composite 2: Fractions and Percentage** **Component 1: Fractions** Equivalent fractions Simplify fractions Converting between improper fractions and mixed numbers Comparing and ordering fractions Fraction of an amount Four operations with fractions **Component 2: Percentages** Percentage of an amount Simple interest Percentage increase / decrease Understanding VAT **Component 3: FDP** Convert between fractions, decimals and percentages One number as a fraction of another One number as a percentage of another	**Composite: Equations, Inequalities and Sequences** **Component 1: solving equations** Solve equations • with brackets • with an unknown on both sides Form and solve equations **Component 2: Inequalities** Inequalities on a number line Satisfy inequalities Solve inequalities including 2 sided inequalities Graphing inequalities including regions **Component 3: Further Algebra** Change the subject of a formula Know the difference between an expression, equation, formula and identity **Component 4: Sequences** Picture / Pattern sequences Term to term rule of sequences Position to term rule (nth term)	**Composite 1: Angles** **Component 1: Properties of shapes** Congruence in shapes Angles in parallel lines **Component 2: Angles in polygons** Angles in triangles Exterior angles of polygons Interior angles of polygons **Component 3: Shape problem solving and application** Tessellations Solve angle problems using equations Geometrical problems showing reasoning **Composite 2: Averages and Range** **Component 1: Averages** Averages and range from a data set Averages and range from a frequency table **Component 2: Averages from statistical diagram** Averages from stem and leaf diagrams Identify outliers Estimate mean and range from *grouped* frequency table Modal class interval and class interval containing the median **Component 3: Sampling** Stratified Sampling	**Composite: Perimeter Area and Volume** **Component 1: Area and Perimeter** Area and perimeter of rectangles, triangles, Parallelograms and trapezium **Component 2: Units of conversions** Convert between metric units (linear, area and volume) Area of compound and composite shapes Solve problems involving area and perimeter **Component 3: 2D/3D shapes** Reading scales Nets of 3D shapes **Component 4: prisms** Surface area of prisms Volume of prisms **Component 5: Solve shape problems** Convert between volume and measures Solve problems involving surface area and volume

Prior knowledge and skills (from previous year / key stage)	Ordering numbers, Rounding, Formal written methods for the 4 operations, Number properties, Directed numbers	Substitution, Simplifying expressions, Writing and using formulae, Algebraic notation, Order of operations Reading tables, Representing data, Averages, Range	Writing or shading a fraction, 4 operations with fractions, Simplifying and equivalent fractions, Converting between fractions, decimals and percentages, Fraction and percentage of an amount	Inequality notation, Sequences, Pattern sequences, Simplifying expressions, Solving equations, Expanding, Substitution	Addition, Subtraction, Multiplication, Division, Forming expressions, Substitution into formulae, Angles properties, Properties of 2D shapes Averages, Frequency tables, Representing data	Reading scales, 3D shapes, Nets, Area and Perimeter, Solving equations, Substituting into formulae, Metric conversions
Assessment Objectives	Apply numeracy skills to solve problems including justification of methods used and decisions made	Manipulating algebra and formulae to solve problems, including justification of methods used	Representing and interpreting data to justify predictions made. Using a combination of fractions, decimals and percentages to make decisions including justifications of methods used	Using algebraic principles to solve unknown values including justification of methods used	Applying geometric and algebraic principles to solve unknown angles Using averages and range to make comparisons between data sets, including justifying reliability	Solving problems using area, perimeter, surface area and volume including justification of decisions made
Vocabulary / Key Subject Terminology	Function, Inverse, Square root, cube root, Highest Common Factor (HCF), Lowest Common Multiple (LCM)	Term, Collecting like terms, Simplify, Formulae, Brackets, Expanding, Factorising Discrete data, Continuous data, Grouped data	Outliers, Correlations, Relationships, Variables, Line of best fit, Estimates, Interpolation, Extrapolation Mixed numbers, Improper fractions, Numerators, Denominators, Simple interest	Equation, Balance method, Brackets, Formulae, Terms, Term to term, Position to term, Pattern sequences, Terms of n, Integers	Congruent, Similar, Parallel lines, Alternate, Corresponding, Vertically Opposite, Exterior angles, Interior angles, Regular Polygon, Irregular, Tessellate Estimate, Sample, Population, Bias, Random Sample	Parallelogram, Trapezium, Compound shapes, Area, Perimeter, Composite, Formulae, Surface area, Volume, Cross-Section, Capacity, Conversions, Prism.
Assessment 1	Prior knowledge assessment at the commencement of each unit of work	Prior knowledge assessment at the commencement of each unit of work	Prior knowledge assessment at the commencement of each unit of work	Prior knowledge assessment at the commencement of each unit of work	Prior knowledge assessment at the commencement of each unit of work	Prior knowledge assessment at the commencement of each unit of work
Assessment 2	End of unit test followed by WCF and self-assessment (Active Teach)	End of unit test followed by WCF and self-assessment (Active Teach)	End of unit test followed by WCF and self-assessment (Active Teach)	End of unit test followed by WCF and self-assessment (Active Teach)	End of unit test followed by WCF and self-assessment (Active Teach)	End of unit test followed by WCF and self-assessment (Active Teach)
Cross Curricular Links with other Faculties	**Number** **Science** - 7.3 (Energy stores and transfers) **Aspire** - 7.5 (Eco-systems) **British Values – Component 6- Individual Liberty – Gender gap and women in mathematics/STEM**	**Algebra** **Business** - 9.rotation (becoming an accountant) **Science** - 8.2 (mixtures and the changing earth) **British Values – Component 1-6 - Mutual respect – Maths disabilities (e.g., Dyscalculia and other disabilities)**	**Interpreting and Representing data** **English** - Throughout **Business** - Year 8.rotation (becoming an accountant) **Fractions, Ratio and Percentages** **Business** - 10.5 (The economy and business) **British Values – Individual liberty – Use of data to manipulate audience.** **British Values – Democracy-Component 6- The strengths, advantages and disadvantages of democracy, and how democracy works in Britain, in contrast to**	**Equations, Inequalities and Sequences** **Computing** - 10.1 (the NEA) **Health and Wellbeing –** Ongoing **British Values – Component 1 - Individual liberty – Alan Turing rule of coding discussed with students.**	**Angles** **Art** - 9.rotation (arc deco design negative space) **Averages and Range** **Science** - 7.3 (interactions and interdependences) **British Values: Component 3 - Democracy: Maths and the use of data have a significant impact in the democratic decision making and influencing change. Students can look at statistics to justify and argue for particular positions. The development of critical thinking skills using**	**Perimeter Area and Volume** **Modern Foreign Language** - 8.6 (identity and culture) **Art** - 8.rotation (Garden planting design) **British Values – Component 2 – Rule of law. All weighed products must be sold with a metric weight stamped upon them for example a pint of milk is now 568ml of milk.**

			other forms of government in other countries/regions		maths with help develop student resilience.	
Knowledge Organiser content	Key vocabulary, formulae and concepts meet within each unit, including Hegarty Maths clip numbers to promote independent learning opportunities	Key vocabulary, formulae and concepts meet within each unit, including Hegarty Maths clip numbers to promote independent learning opportunities	Key vocabulary, formulae and concepts meet within each unit, including Hegarty Maths clip numbers to promote independent learning opportunities	Key vocabulary, formulae and concepts meet within each unit, including Hegarty Maths clip numbers to promote independent learning opportunities	Key vocabulary, formulae and concepts meet within each unit, including Hegarty Maths clip numbers to promote independent learning opportunities	Key vocabulary, formulae and concepts meet within each unit, including Hegarty Maths clip numbers to promote independent learning opportunities
Extra-Curricular Offer	"Problem of the week" Maths booster sessions Chess club Puzzle club Mastermind club Hegarty Maths club	"Problem of the week" Maths booster sessions Chess club Puzzle club Mastermind club Hegarty Maths club	"Problem of the week" Maths booster sessions Chess club Puzzle club Mastermind club Hegarty Maths club	"Problem of the week" Maths booster sessions Chess club Puzzle club Mastermind club Hegarty Maths club	"Problem of the week" Maths booster sessions Chess club Puzzle club Mastermind club Hegarty Maths club	"Problem of the week" Maths booster sessions Chess club Puzzle club Mastermind club Hegarty Maths club

Maths / Year 10 Foundation / Academic Year 2022 - 2023

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Curriculum Content	**Composite: Graphs** **Component 1: Coordinates** Vertical and horizontal graphs Calculate the midpoint of a line segment **Component 2: Linear Graphs** Plotting straight line graphs Estimates using straight line graphs **Component 3: Equations of lines** Calculate the gradient y= mx+c including naming equations of a line **Component 4: Parallel and Perpendicular lines** Parallel lines Perpendicular lines **Component 5: Real life graphs** including fixed charges Distance –time graphs Rate of change graph Velocity-time graph Using graphs to make predictions	**Composite: Transformations** **Component 1: Translations including column vectors** **Component 2: Reflections** **Component 3: Rotations** **Component 4: Enlargements** **Combining transformations** **Composite: Ratio and Proportion** **Component 1: Writing ratio** Simplifying a ratio [including 1:n n:1]; Equivalent ratio Converting between ratio and fractions **Component 2: Scales** Model scales Scaling when given a ratio plus one other value Ratio which require conversions Using n:1 and 1:n to make comparisons **Component 3: Dividing ratio** Sharing in a given ratio **Component 5: Proportion** Using proportion and ratio to solve problems Exchange rates Recipe proportion Unitary method direct proportion problems Best value problems **Component 6: Inverse and Direct Proportion** Recognising direct proportion including on graphs Using direct proportion graphs to solve problems Worded direct / inverse proportion problems	**Composite: Right-Angles Triangles** **Component 1: Pythagoras** Theorem **Component 2: Trigonometry** (sides and angles) Angles of elevation and depression **Component 3: Problem Solving with Pythagoras and Trig** Solving problems which combine Pythagoras Theorem and Trigonometry*Exact values of sine, cosine, and tangent **Composite: Probability** **Component 1: Probability notation** Probability from equally likely events Probability of an event not happening **Component 2: Calculating outcomes** Mutually exclusive events Exhaustive Probability (sum to 1) Experimental Probability Relative frequency Justifying best estimates (number of trials) **Component 3: Probability from Statistical diagrams 1** Probability from two-way tables and frequency trees Sample space diagram Listing possible outcomes **Component 4: Probability from Statistical diagrams 2** Set notation Venn Diagrams (probability) Independent and dependent probabilities Probability using Tree Diagrams	**Composite: Multiplicative Reasoning** **Component 1: Percentages** Percentage profit / loss More complex one number as a percentage of another Reverse percentage **Component 2: Real life** Income tax, National Insurance and Pension Contribution **Component 3: Percentage Change** Percentage change Repeated percentage change Compound Interest / Depreciation Overtime / Income problems **Component 4: Compound Measures** (including conversions required) Distance/Speed/Time **Component 5: More compound measures** Density/Mass/Volume Pressure/Force/Area Kinematics formulae **Component 6: Direct and Inverse Proportion** Apply algebraic proportion notation including formulae	**Composite: Constructions, Loci and Bearings** **Component 1 : Properties of 3D shapes** Faces, Edges and Vertices Properties of Pyramids Component 2: Planes of symmetry Plans and Elevations **Component 3: Constructing triangles** (SSS, SAS, ASA, RHS) Using and applying scales for reading maps and scale drawings **Component 3: Constructing angles** Accurately constructing angles Constructing perpendicular bisectors including from a point on a line and a point above/below a line Construct an angle bisector **Component 4: Loci** Loci from a point, a line, equidistant from two points and two intersecting lines Shading regions to satisfy a set of requirements **Component 4: Bearings** Revision of angles in parallel lines Problem solving with bearings	**Composite: Quadratic Equations and Graphs** **Component 1: Expanding double brackets** **Component 2: Quadratic Graphs** Recognise a quadratic expression Plot quadratic graphs including identifying line of symmetry and maximum / minimum turning point Identify quadratic graphs as having a parabola **Component 3:** Interpret real life quadratic graphs **Component 4: Solving Quadratics** Using roots to solve quadratic equations from quadratic graphs **Component 5: Factorising and solving quadratics** Factorise quadratic equations including difference of two squares Solve quadratic equations via factorisation

Prior knowledge and skills (from previous year / key stage)	Coordinates, substitution, Scales, Order of operations, Directed numbers, Table method	Plotting straight lines, Refection, Rotation, Translations, Enlargements Writing and sharing ratios, Equivalence	Squaring and square rooting, Triangle properties, Substitution, Rearrange formulae Probability language, Simplifying fractions, Writing probabilities	Metric conversions, Percentage of an amount, Substitution, Using Formulae, Rearranging Formulae	Compass Points, Clockwise/Anti clockwise, Angles facts, Parallel lines angle facts, Symmetry	Collecting like terms, Substitution, Expanding, Factorising
Assessment Objectives	Plotting and interpreting straight line graphs to give solutions to problems, including justification of methods used	Using transformations to interchange between an object and an image. Apply ratio and proportion principles to give justifications to real life problems	Recall and apply formulae to calculate missing sides and angles in triangles Use principles of probability to justify decision based on likely outcomes	Using a well-developed understanding of multiplicative reasoning to solve real life problems	Using advanced motor skills to make scaled drawing to represent solutions	Apply and represent graphically principles of algebra to justify solutions and estimates.
Vocabulary / Key Subject Terminology	Midpoint, Gradient, Parallel Lines, Perpendicular Lines, y-intercept, Vertical, Horizontal	Column Vector, Mirror Line, Centre of rotation, Scale Factor Ratio, Simplify, Proportion, Unit Ratios, Unitary Method, Direct and Inverse proportion	Hypotenuse, Opposite, Adjacent, Sine, Cosine, Tangent, Angle of elevation, Angle of depression Mutually Exclusive, Exhaustive, Experimental probability, Independent, Conditional	Percentage change, Compound interest, Repeated change, Density, Pressure, Kinematic formulae, Velocity, Acceleration, Constant, Initial	Faces, Edges, Vertices, Pyramids, Prisms, Elevation, Hypotenuse, Scale Factor, Net, Construction, Bisector, Loci	Roots, Function, Difference of two squares, Solutions, Quadratic
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Cross Curricular Links with other Faculties	**Straight Line Graphs Computing** – 9.6 (Computer design gamer course) **British Values – Component 1 - Mutual respect** – look at key statistics, key figures such as Stephen Hawking, Thomas Edison and Albert Einstein.	**Ratio and Proportion Modern Foreign Language** - 8.2 (Local area and holiday destination) **British Values – Component 4 - Individual Liberty** – Students can explore individual liberty through a study of numerical constraints.	**Probability Science** - 7.1 (safety skills) **Computing** - 11.2 (logic gates) **British Values – Component 4 - Mutual respect and tolerance** – Celebration of people from a wide variety of backgrounds and cultures.	**Multiplicative Reasoning Humanities** - 10.1 (field work) **Science** - 10.6 (Particle model) **British Values: Component 1: mutual respect and tolerance-** how is tax viewed by different cultures and religions	**Geometry and Measures Humanities** - Throughout KS3 **Computing** - 8.2 (digital imaging) **British Values – Tolerance - component 2** - Use maths to learn about different faiths and cultures around the world. E.g. looking at patterns/shapes within Islam / Hindu religions.	**Graphs Health and Wellbeing** - 7.6 (Methods of training) **British Values: Component 4: mutual respect and tolerance:** The Persian mathematician Muhammad Al-Khwarizmi was one of the greatest of early Muslim mathematicians. He introduced the fundamental algebraic methods of simplifying and solving equations including quadratics that are still used today.

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