KS3 Maths / Year 7 / Academic Year 2022-2023

Year 7	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Curriculum Content	**Composite: Number & Algebra** **Component 1: All four operations** with directed numbers **Component 2: Ordering numbers** including negatives **Component 3: Powers & roots** Square and cube numbers **Component 4: Decimals** - Place value and ordering decimals - Rounding to decimal places and significant figures - Four operations with decimals **Component 5: Fractions** - Equivalent fractions - Ordering and comparing fractions - Simplifying fractions - Adding and subtracting fractions **Component 6: Understand Algebraic notation** **Component 7: Expressions** - Simplify by collecting like terms - Expanding single brackets - Forming expressions	**Composite: Ratio & proportion** **Component 1**: **Multiplying and diving fractions** - Converting between Mixed and improper fractions **Component 2: Correct notation to find and compare parts** - Writing and simplifying a ratio including 1: n; equivalent ratios and when given one value in a ratio **Component 3**: **Formal Division methods to manipulate proportions** - Unitary method to solve proportion (best buys, recipe proportion) **Component 4: Sharing in a given ratio** - When given one value in a ratio **Component 5: Scales and Metric conversions** - Using ratio to convert, simplify and apply to scales and units - Reading and applying scales, convert between metric and imperial **Component 6: Proportion to compare a part with a whole** (Link to FDP) **Component 7: Direct /Indirect proportion problems** - Proportion graphs	**Composite: Number & Geometry and Measure** **Component 1: Mixed Fractions** - Converting between Mixed and improper fractions - Adding and subtracting mixed numbers **Component 2: FDP** - Converting between FDP - Calculating a fraction of an amount **Component 3: Calculating with percentages** - Percentage of amounts, increase /decrease, multipliers, one as a percentage of another and simple interest **Component 4: Calculating area and perimeter of 2D shapes** **Component 5: Working in 3D** - Vertices, edges and faces, nets - Plans and elevations - Isometric drawing **Component 6: Area and Volume** - Calculating surface area - Volume of 3D shapes (including capacity of prisms)	**Composite: Prime numbers, factors and multiple) & Algebra** **Component 1: Factors, Multiples and Primes** - Recognise Factors, Multiples and Prime Numbers. - Product of prime factors. **Component 2: Highest Common factor and lowest common multiple** - Prime factor decomposition - HCF/LCM – Listing method, Calculator Function, Venn Diagram method. - Worded Problems. **Component 3: Formulae, Identities, and expressions** - Function machines - Writing and substituting into formulae/expressions **Component 4: Linear expressions** - Collecting like terms - Expand and Factorise expressions [single brackets] - Challenge: Expanding double brackets **Component 5: Solving Equations** - Solve one step equations - Solve two step equations - Solve with unknowns on both sides [brackets] - Changing the subject [one variable] Challenge: solve with fractions **Component 6: Form and Solve Equations** - Form expressions to solve real life problems - Form and solve equations linked to area and perimeter only	**Composite: Geometry and Measure, angles and Statistics** **Component 1: Calculating measures of central tendency** mean, mode, median and range Comparing data sets using averages **Component 2: Manipulating angles** - Identify angle types and different triangles. - Know and calculate angles facts – angles around a point, angles on a straight line, angles in a triangle. - Challenge: Form and solve Equations involving angle facts. **Component 3: Symmetry** and accurately drawing angles - Measure, draw and estimate angles **Component 4:** Accurately draw triangles - SSS, ASA, SAS, RHS **Component 5**: Display, construct and interpret data using a variety of graphs, tables, and charts	**Composite: Graphical Exploration** **Component 1:** Pattern spotting to generalise a sequence **Component 2:** Term to term rules of sequence (nth term) - Arithmetic sequence [add/subtract] - Geometric [multiply/divide] **Component 3**: Special sequences - Fibonacci sequences - Triangular numbers - Prime and square numbers **Component 4**: Straight line graphs - Line segment notation and midpoint of a line segment - Vertical and horizontal graph [x =a, y=b] - Understand y=x and y=-x - Plotting graphs in the form y=mx+c **Component 5: Scatter Graphs** - Describe correlations - Draw scatter graphs - Interpret scatter graphs
Prior knowledge and skills (from previous year	Understanding place values Shading and writing fractions BIDMAS/BODMAS Calculating through zero Calculate and interpret the mean as an average	Division into equal parts Simplifying using a common factor Plotting graphs Equivalent fractions using common multiples (scaling up / down)	Area and perimeter facts of quadrilaterals and triangles Adding and subtracting fractions. Recalling 3D shapes Applying basic principles of area and numeracy to multi step problems	Algebraic notation Working in the inverse Principles of balancing an equation Prime Numbers Factors and Multiples Angles facts	Use of a protractor, ruler and compass Lines of symmetry Making an estimate of an angle Types of angles (acute, obtuse, right, reflex)	Plotting coordinates Labelling an axis Algebraic notation Substitution into an expression Solving an equation

/ key stage)				Forming an expression		BIDMAS Directed numbers
Assessment Objectives	To apply BIDMAS principles, including use of negative numbers to manipulate algebra and to calculate averages from a variety of data sets.	Demonstrate an understanding of the importance of scaling up or down using the same ratio and proportions, to ensure consistency in desired outcomes, especially with the use of the unitary method	To build upon prior knowledge of area, perimeter and 3D shapes to calculate and justify real world, problem based, scenarios, including working with fractions and mixed numbers.	Use a well-developed understanding of factors, multiples and primes to justify real world problems, including the embedded use of algebraic principles as a strategy to evidence justifications made.	Be confident and competent in the use of advanced motor skills, to make accurate representations of given information, as well as having the ability to justify statements via displaying of data in a variety of ways.	Being able to spot trends and patterns, both with numbers and within patterns. Using well developed motor skills to plot graphs to further spot trends and make predictions.
.Vocabulary / Key Subject Terminology	Averages, Mean, Mode, Median, Range, Negative/Minus, Collecting like terms, Simplifying, Expressions, Expanding, Substitution, Place value,	Scale up / down, Ratio, Direct proportion, Indirect / inverse proportion,	Improper fraction, Mixed number, Trapezium, Parallelograms, Compound shapes, Surface area, capacity, volume, Vertices, Edges and Faces, Multipliers, Prisms,	Highest Common Factor, Lowest Common Multiple, Venn diagram, Prime Number Decomposition, Prime factor tree, Balancing, Inverse operations	Obtuse, Acute, Right Angle, Reflex, Scale, Axis, Labelling, Stem and Leaf, Key, Interpreting, Displaying, Constructions	Ascending, Descending, Finite, Infinite, Sequences, Fibonacci, Midpoint, Line segment, nth term, In terms of n, Beginning point, End point, Function table, Spreadsheet
Assessment 1	30 minutes pre-test based on KS2 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2 prior knowledge, followed by WCF and self assessment
Assessment 2	30 minutes post-test, followed by WCF and self-assessment	End of Term Assessment, followed by comprehensive feedback, following deep marking.	30 minutes post-test, followed by WCF and self-assessment	End of Term Assessment, followed by comprehensive feedback, following deep marking.	30 minutes post-test, followed by WCF and self-assessment	End of Term Assessment, followed by comprehensive feedback, following deep marking.
Cross Curricular Links with other Faculties	**Averages** **Computing** – 8.6 (Databases) **Science** - (throughout) **Humanities** – 7.2 (Measuring development) 7.5 (Weather and Climate) **British Values – Component 1, 2, 4 & 6- Mutual Respect & Tolerance - Celebration of cultural contributions and achievements** **British Values – Individual Liberty – Component 6 - Alan Turing**	**Ratio and Proportion** **Health and Wellbeing** - 9.rotation (responding to a brief) **Humanities** - 7.1 (Geographical skills) **British Values – Component 6- The rule of law** **British Values – Component 1, 2, 4 & 6- Mutual Respect & Tolerance - Celebration of contributions and achievements** https://www.mathscareers.org.uk/article/black-heroes-mathematics/	**Percentages** **Health and Wellbeing** - Methods of training 7.6 **3D Shape** **Science** - 8.1 (Chemistry building blocks) **Art** – KS3.rotation (vessels inspired by Hans Coper) **British Values – Component 3- Individual Liberty** **British Values – Component 4 – Contribution of the Windrush generation to STEM.**	**Multiples and Factors** **Computing** - 11.2 (Data representation) **Equations** **Science** - 9.5/6 (Engineering and automotive) **British Values – Component 3- Individual Liberty – Gender gap and women in mathematics/STEM**	**Constructions** **Art** – 7. rotation (drawing skills) **Graphs (data)** **Science** – 8.2 (mixtures and the change in earth) **British Values – Component 4- Democracy** **British Values – Component 6 - Democracy**	**Sequences** **Computing** - 7.6 (Computer programming training), 8.3 (scratch programming) **Straight Line Graphs** **Computing** – 9.6 (Computer design gamer course) **British Values – Component 2- Mutual Respect & Tolerance - Celebration of cultural contributions and achievements**

	British Vales – Black History Month - Mutual Respect & Tolerance - Celebration of cultural contributions and achievements					**British Values - Financial Resilience Week- The rule of law**
Knowledge Organiser content	Definitions of keywords, formulae and concepts met within averages, negative numbers and manipulation of algebra, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within ratio and proportion, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within percentages, area and volume, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within factors and multiples, and solving equations, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within displaying of data, constructions and mixed numbers with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within sequences and straight-line graphs, with accompanying Hegarty Maths clips, to support independent learning
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

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KS3 Maths / Year 8 / Academic Year 2022 - 2023

Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Curriculum Content	**Composite: Probability** **Component 1: Decimal and fractions operations** - Four operations with decimals - Four operations with fractions - Convert between FDP **Component 2: Events** - Understand language of probability - The probability scale - Writing probability as FDP - Probability facts **Component 3: Comparing likelihoods** - Expected outcomes - Relative frequency - Experimental frequency **Component 4: Drawing and using probability diagrams** - Sample space diagram - Two Way Table **Component 5: Probabilities with sets** - Venn Diagrams (including Set notation) **Component 7: Independent and dependent probabilities** - Frequency trees - Probability trees	**Composite: Ratio and Proportion** **Component 1: Conversion of measure** - Conversion of measures - Currency conversion graphs **Component 2: Compound Measures using formula** (Pressure, Force and Area; SDT) **Component 3: Proportion** - Unitary method - Recipe problems - Best buys - Exchange rates **Component 4: Ratios and fractions** - Writing ratios as fractions **Component 5: Direct and indirect proportion** - Solve direct and inverse proportion problems **Component 6: Percentage Introduction** - Percentage change - Multipliers - Reverse Percentages	**Composite: Algebraic manipulation** **Component 1: Substitution and formula manipulation** - Substitution - Collecting like terms - Index Laws **Component 2: Form and solve expressions from geometry** - Writing expressions - Equations with unknowns on both sides - Expressions, equations and identities - Trial and Improvement **Component 3: Manipulate formulas to calculate missing dimensions** **Component 4: Expanding brackets using geometry facts** - Expand and simplify brackets - Expanding double brackets using geometric facts - Factorise fully **Component 5: Formulae** - Understand and use standard mathematical formulae - Rearrange formulae to change the subject (e.g. Volume, MDV) - Link with ratio and proportion **Component 6: Standard form** - Link with algebraic substitution	**Composite: Number Exploration** **Component 1: Mixed and Improper Fractions** - Simplify fractions - Conversion between mixed and improper fractions - Reciprocals **Component 2: Fractions** - Four operations with fractions including mixed numbers - Fraction of an amount - Reverse fraction of an amount **Component 3: Fraction, Decimals and Percentages** - Ordering a mixture of Fractions, Decimals and Percentages - Solve Problems which require comparisons between FDP - Recurring decimals **Component 4: Percentages** - Percentage of amounts - Increase decrease - Percentages & multipliers - Percentage change - Original amounts Challenge - Reverse percentages - Solve percentage worded problems - Introduce and understand the difference between Simple/Compound Interest	**Composite: Geometry and Measure** **Component 1: Basic Angle Facts** - Angles in a triangle, quadrilateral, on a straight line, around a point, vertically opposite angles. - Forming and solving equations involving angles. **Component 2: Polygon Angle Facts** - Interior and exterior angles in polygons - Challenge - Use formulae and algebra to find any angle in any polygon. - Form and solve equations linked to polygons **Component 3:** Parallel line - Angles within Parallel lines- corresponding, alternate and co interior angles. - Form and solve equations involving parallel line angles **Component 4: Statistics – Charts & Graphs** - Express data in a variety of graphs - Pie chart - Scatter graphs - Frequency polygons - Stem and leaf - Misleading graphs	**Composite: Graphical Exploration** **Component 1: Straight line graphs** - X= a y = b lines - Table of values - Plotting Straight line graphs using y =mx+c **Component 2:** More straight-line graphs - Calculate and interpret gradients of a line - Equation of a line in form of y=mx+c - Mid-point of line segments **Component 3:** Rates of change graphs **Component 4:** Rotations using graphs - Rotate shapes - Describe rotations **Component 5:** Reflections - Draw and describe reflections - **Component 6:** Lines, planes and rotational order of symmetry **Component 7:** Translations - Translating shapes - Describing translations - Basic arithmetic with column vectors - Mixed Transformations **Challenge:** Enlargements -Linear, Area and Volume Scale Factors

Prior knowledge and skills (from previous year / key stage)	Writing fractions, decimals and Percentages Converting between fractions, decimals and Percentages 4 operations with fractions, decimals and percentages Simplifying fractions Fraction and percentage of an amount	Substitution into formulae Multipliers to increase / decrease percentages Plotting coordinates Plotting graphs Equivalence between fractions, decimals and percentage	Solving one and two step equations Expand and Factorise basic linear expressions Properties of shape including recognising when elements are equal Coordinates Drawing axis	Working with fractions, decimals and percentages Fraction of an amount Key conversions between fractions, decimals and percentages Time facts Percentage means “out of 100” Percentage of an amount Multiplying by 10, 100, 1000 etc. Lines of symmetry Plotting lines on a graph (mirror lines)	Basic angle facts including triangles, quadrilaterals, straight lines, around a point. Constructions of triangles Motor skills including use of protractor, compass, ruler. Understanding of direction of North and clockwise/anti clockwise.	Use of spreadsheets Percentage of an amount Percentage increase / decrease Profit / loss Plotting Straight Line Graphs Plotting coordinates Mid-point calculations Re-arranging a formula to change the subject
Assessment Objectives	Use a variety of probability methods, both theoretical and experimental, to calculate and justify the likely outcome of an event occurring	Apply formulae that use the relationship between different factors to answer complicated questions and provide solutions to technical problems. Apply the unitary method to justify statements of proportion, including compound interest and reverse percentages. To be able to enlarge a shape	Confidently make connections between algebraic principles and geometry principles, to solve problems that require students to calculate unknown values. To be able to move images using column vectors, and add and subtract column vectors.	Use prior knowledge of fractions, decimals and percentage and apply this to real world, problem-based, scenarios. Confidently working with percentage and standard form, to support cross-curricular requirements of numeracy. To be able to translate a shape To be able to reflect a shape. To be able to work with principles of symmetry.	Make connections between angle facts and angles on parallel line facts to confidently calculate and justify problems involving bearings, including constructing scale drawings to support justifications	Working with straight-line graphs to calculate gradients, including those that require re-arranging. Interpreting graphs to make estimates and statements of fact. Use graphs to displays results of experiments. To be able to rotate a shape, and use all four transformations to solve problems.
.Vocabulary / Key Subject Terminology	Chance, Exhaustive Independent / Dependent Equally Likely, Outcomes Theoretical, Mutually Exclusive, Experimental Tree Diagram	Compound, Scaling up/down, Unitary, Proportion, Direct, Indirect, Inverse, Investments, Best value, Fixed charge, Multipliers, Repeated, Depreciation, Scale Factor, Linear, Centre of Enlargement	Expressions, Simplify, Index/Indices, Trial and Improvement, Expanding, Factorise, Solution, Profit / Loss, Simple Interest, Translation, Column Vector	Mixed Numbers, Improper fractions, Reciprocals, Convert, Recurring, Standard Form, Vertical, Horizontal, Diagonal, Mirror lines, Plane of symmetry, Rotational order.	Corresponding, Alternate, Vertically Opposite, Co-interior, Regular, Internal, External, Similar, Congruent, Polygon, Bearing, Clockwise, Anticlockwise, Bisector, Perpendicular, Loci, Regions	Gradient, y-intercept, Mid-point, Linear functions, Non-linear Functions, Rotation, Centre of Rotation, Spreadsheets, Transformations.
Assessment 1	30 minutes pre-test based on KS2/ Year 7 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2/ Year 7 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2/ Year 7 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2/ Year 7 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2/ Year 7 prior knowledge, followed by WCF and self assessment	30 minutes pre-test based on KS2/ Year 7 prior knowledge, followed by WCF and self assessment
Assessment 2	30 minutes post-test, followed by WCF and self-assessment	End of Term Assessment, followed by comprehensive feedback, following deep marking. (in line with academy assessment dates)	30 minutes post-test, followed by WCF and self-assessment	End of Term Assessment, followed by comprehensive feedback, following deep marking. (in line with academy assessment dates)	30 minutes post-test, followed by WCF and self-assessment	End of Term Assessment, followed by comprehensive feedback, following deep marking. (in line with academy assessment dates)

Cross Curricular Links with other Faculties	**Probability** **Science** 8.1 (genetics and evolution) **English** – Throughout (Two-way tables) **British Values – Component 2 - The rule of law – Balance of probabilities**	**Ratio and Proportion** **Health and Wellbeing** – 7.rotation (introduction to the kitchen) **Business** - 10.5 (Factors that affect businesses) **British Values – component 6 - The rule of law – Economics and business**	**Algebra** **Computing** - 8.6 (databases) **Number** **Business** - 9. rotation (becoming an accountant), 11.3 (cash flow) **British Values – Component 6 - Mutual respect – Maths disabilities (e.g, Dyscalculia and other disabilities)**	**Number** **Science** - 9.5 (radiography) **Computing** - 9.rotation (becoming an accountant) **Geometry and Measures** **Art** - 8.rotation (Art novo border design decorative design) **British Values – Tolerance - component 7 - Use maths to learn about different faiths and cultures around the world. E.g. looking at patterns/shapes within Islam / Hindu religions.**	**Geometry and Measures** **Humanities** - Throughout KS3 **Computing** - 8.2 (digital imaging) **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 other forms of government in other countries/regions**	**Algebra** **Science** - 9.6 (Engineering) **Financial Resilience week** **Computing** - 7.1 (Microsoft office), 8.6 (database) **British Values – Individual liberty – Component 3 - Graph work to include topics of where individual liberty has been encroached.**
Knowledge Organiser content	Definitions of keywords, formulae and concepts met within probability, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within conversions, compound measures, unitary method and enlargements with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within algebra, percentages, standard form and translations, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within fractions, decimals and percentages and reflection and symmetry, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within geometry and measures, with accompanying Hegarty Maths clips, to support independent learning	Definitions of keywords, formulae and concepts met within work with straight line graphs, gradient and rotations with accompanying Hegarty Maths clips, to support independent learning
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