Year 8 Maths Curriculum Overview

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Unit of Work	Directed numbers Algebraic notation Sequences Coordinates and graphs	Properties of number Measures Area Transformation	Calculating using fractions Solving equations Probability Ratio notation	Rounding and estimation Percentages	Plans elevations and surface area Angles	Volume Charts and graphs Averages
Ethos Links	STEM - use of graphs in many STEM related careers	STEM – Use of area and scale factors within scale drawings Milton Keynes – scale drawings and plans of Milton Keynes	STEM- Use of algebra in many different areas of business and applications of equations STEM – use of probability and how likely events are to happen Milton Keynes – use of probability and how likely events are to happen	STEM - encourage use of rounding and estimation in real life applications STEM – use of percentages in real life context Sustainability – in production of packaging	STEM – Use of plans and elevations and careers where they are relevant	STEM, Sustainability and Milton Keynes – all used in many applications with pie charts
Knowledge	By the end of this unit students will know and understand: *Directed numbers* 1. Solve additive reasoning problems with negative numbers eg 3 - ( ) = 7	By the end of this unit students will know and understand: *Properties of number* 1. Identify and explain whether a number is or is not a multiple of a given integer (divisibility tests) 2. Know and recognise	By the end of this unit students will know and understand: *Calculating using fractions* 1. Appreciate that, for any two numbers there is always another number in between them	By the end of this unit students will know and understand: *Rounding and estimation* 1. Round to a given number of decimal places 2. Round numbers to a given number of significant figures	By the end of this unit students will know and understand: *Plans elevations and surface area* 1. Draw a shape given the plan, elevation and front view 2. Draw the net of any 3D shape	By the end of this unit students will know and understand: *Volume* 1. Understand the definition of a prism and calculate the volume.

	2. Multiply negative numbers 3. Divide negative numbers *Algebraic notation* 4. Expand brackets such as 3(a + 4b) = 3a + 12b and $3p^2(2p + 3b) = 6p^3 + 9bp^2$ 5. Understand that algebraic notation e.g. ab in place of axb, a^2b in place of a x a x b, a/b in place of a÷b 6. Factorise expressions with a single bracket such as 3a + 12b =3(a + 4b) and $6p^3 + 9bp^2=3p^2(2p + 3b)$ and recognise that expanding and factorising	square numbers to $12^2= 144$ 3. Calculate using order of operations (BIDMAS) 4. Understand what a prime number is e.g. the first five prime numbers are 2, 3, 5, 7, 11 5. Write a number as a product of its prime factors e.g. 12 = 2x2x3 6. Find HCF and LCM of two numbers *Measures* 1. Read and use bus/train timetables 2. Convert between metric units of measurements for length, weight and volume *Area* 1. Solve area problems using the inverse in	2. Add and subtract mixed numbers 3. Multiply fractions 4. Divide fractions and understand and use reciprocals *Solving equations* 1. Solve equations with single brackets 2. Understand inequalities and how to label them on a number line 3. Solve one and two step inequalities *Probability* 1. Construct a two-way table 2. Construct sample space and calculate the probabilities of combining two independent events 3. Calculate the probability of an	3. Estimate calculations by rounding to 1 significant figure and know that 1 s.f. is standard procedure for estimating *Percentages* 1. Confidently calculate a percentage increase or decrease of any percentage with a calculator (multiplier method)	(including compound shapes) 3. Calculate the surface area of a prism (non-cylinder) *Angles* 1. Solve problems that require use of a combination of angle facts to identify values of missing angles 2. Identify alternate, corresponding and supplementary/co-interior angles on parallel lines 3. Know and use the correct language to justify calculations based on	2. Calculate the volume of a cylinder *Charts and graphs* 1. Construct and interpret pie charts 2. Know when it is appropriate to use a pie chart and what it is for *Averages* 1. Compare data sets by comparing averages and range 2. Create a frequency table from a given dataset and appreciate the relationship between the two

	are the reverse of one another 7. Collect like terms and simplify expressions with brackets e.g. 10 – 2(3a + 4) = 2 - 6a *Sequences* 8. For decreasing sequences, derive the sequence from the expression for the nth term and vise versa *Coordinates and graphs* 1. Identify and label coordinates in all four quadrants with an appreciation of the relevance of positive and	parallelograms, rectangles and triangles 2. Calculate the area of compound shapes and trapeziums 3. Calculate the area and circumference of circles and basic sectors such as semicircles *Transformation* 1. Construct and describe reflections using horizontal and vertical lines such as x = 1 and y = 4 2. Construct and describe reflections using y = x and y = -x 3. Translate a shape given directions (e.g. 5 left, 2 up) 4. Translate a shape using column vectors 5. Enlarge a shape with a positive scale factor (no	event not happening e.g. If there is a 0.3 chance of raining tomorrow, then the chance of it not raining is 1-0.3 = 0.7 4. Enter values into a Venn diagram *Ratio notation* 1. Solve proportional recipe problems with ratios 2. Share in a given ratio (answer may include decimals) *3.* Solve problems with fractions and ratios		each of the above.	3. Identify the mode of a set of data in a frequency table 4. Identify/calculate the median of a set of data in a frequency table 5. Calculate the mean of discrete data in a frequency table

	negative values 2. Plot 2D shapes using coordinates 3. Identify, understand and draw lines that are parallel to the x and y axis 4. Recognise, understand and use the line y=x 5. Reflect coordinates in the x and y axis 6. Reflect coordinates in y=x 7. Understand the relationship between linear graphs and sequences	centre of enlargement) 6. Enlarge a shape with a positive scale factor given the centre of enlargement 7. Rotate a shape 90, 180 or 270 degrees from the origin 8. Rotate a shape 90, 180 or 270 degrees from any given coordinate				
Skills	By the end of this unit students will be able to: • Use mathematical language and algebraic notation	By the end of this unit students will be able to: • Substitute into formulas to calculate area	By the end of this unit students will be able to: • Find missing parts of a ratio using multiplication and division	By the end of this unit students will be able to: • Round to decimal places and significant figures • Estimate by rounding	By the end of this unit students will be able to: • Apply area calculations and	By the end of this unit students will be able to: • Substitute into formulas to calculate volume

	• Apply multiple representations within algebra • Fluently calculate with directed numbers (add, subtract, multiply and divide) • Notice patterns in sequences and describe them • Draw horizontal and vertical lines • Plot coordinates in all 4 quadrants • Plot coordinates on a graph Learning habits • Making links and applying knowledge • Learning from mistakes • Risk taking • Perseverance • Noticing • Resilience • Communicating - use mathematical language • Justify, explain and reason	• Reflect, rotate, translate, and enlarge shapes • Use vector notation Learning habits • Problem solving • Making links and applying knowledge • Resilience • Thinking • Questioning • Noticing • Concentrating • Self-regulation	• Use the inverse to solve equations • Add and subtract mixed numbers • Draw a sample space diagram Learning habits • Listening • Communicating • Analysis and evaluation • Reasoning and making judgements • Collecting and using data • Noticing • Questioning • Creating, imagining, innovating • Problem solving • Making links and applying knowledge • Creating, imagining and innovating	• calculate percentage increases and decrease • Use a percentage multiplier Learning habits • Noticing • Creating, imagining, innovating • Problem solving • Making links and applying knowledge • Reasoning and making judgements	addition to calculate surface area • Draw a 3D shape using isometric paper • Draw a plan, side and front view of a 3D shape • Identify faces, vertices and edges of 3D shapes • Identify angles on parallel lines • Provide full reasoning when explaining missing angles • Link angle rules and forming and solving equations Learning habits • Problem-solving • Making links and applying knowledge • Thinking, reasoning and making judgements • Communicating • Create, imagine, innovate • Collect and use data • Research • Explain and reason • Analysis and evaluation • Questioning	• Use the formula for volume to solve familiar and unfamiliar problems • Analyse, reason and conclude on results based upon calculations of averages • Use a protractor to construct pie charts • Make comparisons between different types of average • Use a table to calculate averages Learning habits • Problem-solving • Making links and applying knowledge • Thinking, reasoning and making judgements • Analysis and evaluation • Research • Collecting and using data

KS3 Curriculum Overview: Maths

Key Vocabulary	Positive Negative Integer Expression Expand Coefficient Term Constant Horizontal Vertical Line	Area Volume Metric Radius Diameter Circumference Square root Cube root Reflection Rotation Translation Enlargement Centre	Part Whole Scale Mixed number Improper fraction Inverse Equation Sample space	Significant figure Decimal place Decimal point Multiplier	Prism Cross-section Parallel Alternate Corresponding Co-interior Plan Front Side Vertices Edges Faces	Mean Mode Median Range Average Spread Pie chart Proportion Frequency
Assessment	Homework Questioning Self-assessment for Algebraic notation Self-assessment for Sequences Mini assessment for Directed numbers Self-assessment for Coordinates and graphs	Homework Questioning Self-assessment for Properties of numbers Self-assessment for Measures Mini assessment for Area Self assessment for Transformations	Homework Questioning Mini-assessment for Ratio Mini assessment for calculations involving fractions Self-assessment for Solving equations Self-assessment for Probability	Homework Questioning Self-assessment for Rounding and estimation Mini assessment for Percentages	Homework Questioning Self-assessment for Plans and elevations Self-assessment for Angles	Homework Questioning Self-assessment for Volume Mini assessment for Charts and graphs Self-assessment for Averages
Assessment	Formal assessments take place on 3 occasions throughout the year. These assess topics up to that point.					