SUBJECT:	Maths	YEAR GROUP:	Year 8

PURPOSE OF STUDY

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject

THE NATIONAL CURRICULUM FOR MATHS AIMS TO ENSURE THAT ALL PUPILS:

The national curriculum for mathematics aims to ensure that all pupils:
- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

NATIONAL CURRICULUM LINKS

Science: Use of graphs to display data; Use of algebraic formula in chemistry and physics; Use of addition, subtraction, multiplication and division.

Humanities: Use of graphs to display data; Interpretation of data in graphs, table and charts.

English: Use of inference in worded problems; Retrieval of relevant information.

Art: Use of shapes and angles in artists work.

TOPICS COVERED:

- Ratio and Scale
- Multiplicative Change
- Multiplying and Dividing Fractions
- Working in the Cartesian Plane

- Representing Data
- Tables and Probability
- Brackets, Equations and Inequalities
- Sequences
- Indices
- Fractions and Percentages
- Standard Index Form
- Number Sense
- Angles in Parallel Lines and Polygons
- Area od Trapezia and Circles
- Line Symmetry and Reflection
- The Data Handling Cycle
- Measures of Location

INTENT OF SUBJECT:

The study of maths throughout year 8 will build on the pupils learning from KS2 and equip them with the skills needed to become fluent in the areas of maths they require for their journey through each year of school and a goal of completing examinations in the subject at the end of KS4. The maths curriculum also aims to develop a love of the subject and allow pupils to understand the real-life applications of the skills they learn so they are able to continue to use them in their lives beyond school. This will be done through the study of: Algebraic thinking; Place value & proportion; Applications of number; Directed number; Fractional thinking; Lines & angles; Reasoning with number.

SKILLS OVERVIEW BY HALF TERM:

AUTUMN ONE	AUTUMN TWO
- Understand the meaning and representation of ratio - Understand and use ration rotation - Solve problems involving ratios of the form 1 to n or n to 1 - Solve problems involving the ratios of the form m to n - Divide in a given ration - Express ratios in their simplest integer form - Express ratios in the form 1 to n - Compare ratios and fractions - Understand pi as a ratio - Understand gradient as a ratio - Solve problems involving direct proportion	- Work with coordinates in all four quadrants - Identify and draw lines that are parallel to the axis - Recognise and use the line yx - Recognise and use the lines of the form ykx - Link ykx to direct proportion problems - Explore the gradients of the line ykx - Recognise and use the lines of the form yxa - Explore graphs with negative gradients - Link graphs to linear sequences - Plot graphs of the form ymxc - Explore non linear graphs

- Explore conversion graphs - Convert between currencies - Explore direct population graphs - Explore relationships between similar shapes - Understand scale factors as multiplicative representations - Draw and interpret scale diagrams - Interpret maps using scale factors and ratio - Represent multiplication of fractions - Multiply a fraction by an integer - Find the product of a pair of unit fractions - Find the product of a pair of any fractions - Divide an integer by a fraction - Divide a fraction by a unit fraction - Understand and use the reciprocal - Divide any pair of fractions - Multiply and divide algebraic fractions	- Find the midpoint of a line segment - Draw and interpret scatter graphs - Understand and describe linear correlation - Draw and use line of best fit - Identify non linear relationships - Identify different types of data - Read and interpret ungrouped frequency tables - Represent grouped discrete data - Represent continuous data grouped into equal classes - Construct and interpret two way tables - Construct sample spaces for one or more events - Find probabilities from a sample space - Find probabilities from two way tables - Find probabilities from venn diagrams - Use the product rule for finding the total number of possible outcomes
SPRING ONE	**SPRING TWO**
- Form algebraic expressions - Use directed number with Algebra - Multiply out a single bracket - Expand multiple single brackets and simplify - Expand a pair of binomials - Solve equations including with brackets - Form and solve equations with brackets - Understand and solve simple inequalities - Form and solve inequalities - Sole equations and inequalities with unknowns on both sides - Form and solve equations and inequalities with unknowns on both sides - Identify and use formulae expressions, identities and equations - Generate sequences given a rule in words - Generate sequences given a simple algebraic rule - Generate sequences given a complex algebraic rule - Find the rule for the nth term of a linear sequence - Adding and subtracting expressions with indices	- Work with coordinates in all four quadrants - Identify and draw lines that are parallel to the axis - Recognise and use the line yx - Recognise and use the lines of the form ykx - Link ykx to direct proportion problems - Explore the gradients of the line ykx - Recognise and use the lines of the form yxa - Explore graphs with negative gradients - Link graphs to linear sequences - Plot graphs of the form ymxc - Explore non linear graphs - Find the midpoint of a line segment - Draw and interpret scatter graphs - Understand and describe linear correlation - Draw and use line of best fit - Identify non linear relationships - Identify different types of data

• Simplifying algebraic expressions by multiplying indices • Simplifying algebraic expressions by dividing indices • Using the addition and subtraction law for indices • Exploring powers of powers	• Read and interpret ungrouped frequency tables • Represent grouped discrete data • Represent continuous data grouped into equal classes • Construct and interpret two way tables • Construct sample spaces for one or more events • Find probabilities from a sample space • Find probabilities from two way tables • Find probabilities from venn diagrams • Use the product rule for finding the total number of possible outcomes
SUMMER ONE	**SUMMER TWO**
• Understand and use basic angle rules and notation • Investigate angles between parallel lines and the transversal • Identify and calculate alternate and corresponding angles • Identify and calculate with co interior alternate and corresponding angles • Solve complex problems with parallel line angles • Constructions, triangles and special quadrilaterals • Investigate the properties of special quadrilaterals • Identify and calculate with sides and angles in special quadrilaterals • Understand and use the properties of diagonals of quadrilaterals • Understand and use the sum of the exterior angles of any polygon • Understand and use the sum of the interior angles of any polygon • Calculate missing interior angles in regular polygons • Prove simple geometric facts • Construct an angle bisector • Construct a perpendicular bisector of a line segment • Calculate the area of triangle, rectangles and parallelograms • Calculate the area of a trapezium	• Set up a statistical enquiry • Design and criticise questionnaires • Draw and interpret pictograms, bar charts and vertical line charts • Draw and interpret multiple bar charts • Draw and interpret pie charts • Draw and interpret line graphs • Choose the most appropriate diagram for given set of data • Represent and interpret grouped quantitative data • Find and interpret the range • Compare distributions using charts • Identify misleading graphs • Understand and use the mean, median and mode • Choose the most appropriate average • Find the mean from an ungrouped frequency table • Find the mean from a grouped frequency table • Compare distributions using average and the range • Identify outliers

- Calculate the perimeter and area of compound shapes
- Investigate the area of a circle
- Calculate the area of a circle and parts of a circle without a calculator
- Calculate the area of a circle and parts of a circle with a calculator
- Calculate the perimeter and area of compound shapes recap
- Recognise line symmetry
- Reflect a shape in a horizontal or vertical line (2 lessons)
- Reflect a shape in a diagonal line