Maths Year 9 Curriculum overview

The below is intended to provide parents and pupils with a simple overview of Year 8 Maths. Should you have any additional questions please do not hesitate to contact Miss Price. We strongly encourage parents to look through their child's books and talk with them about their studies. In addition to the knowledge quizzes at the end of each unit the pupils will complete 3 larger assessments which will cover the units over a term.

Learning Focus	Assessments
Unit 1: Estimation and Approximation	
Key Skills/ Knowledge: • Understand and use place value • Estimate the size of everyday objects, distances etc. • Rounding to decimal places & significant figures. • Make and justify estimates and approximations of calculations by rounding to suitable significant figures/decimal places. • Estimate an answer before calculating. • Check the reasonableness of answers. • Truncate a number to a given degree of accuracy. • Application of estimation from worded context. • Identify and interpret upper and lower bounds. • Use inequality notation to specify simple error intervals for rounding and truncation. (Writing bounds as an inequality) • **Calculate with bounds, including from worded questions.** • **Choose an appropriate degree of accuracy using calculations of bounds.** • **Estimate powers and roots of any given positive numbers**	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.
Unit 2: Measures	
Key Skills/ Knowledge: • Estimate the size of everyday objects. • Suggest suitable units to estimate or measure length, mass and capacity. • Work out time intervals. • Plan journeys using timetables. • Use units of measure, including compound units. • Convert between imperial units of measure • Convert between units of measure, including compound and area units. • Calculate with time and timetables • Calculate with speed, distance and time. • Construct & interpret distance-time graphs. • Construct & interpret simple velocity-time graphs. • Calculate with mass, density & volume. • Calculate pressure, force & area. • Convert between units of measure including compound units from algebraic contexts. • Exchange rates. • **Understand that gradient of a velocity-time graph is acceleration.** • **Understand area under speed-time graph is distance covered.** • **Understand acceleration-time graphs**.	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.

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Unit 3: Algebraic Manipulation	
Key Skills/ Knowledge: • Understand and use the concepts and vocabulary of expressions, equations, formulae, functions, inequalities, terms, and factors. • Forming algebraic expressions and formulae. • Form an expression to show the area and perimeter of simple shapes. • Use arithmetic operations with algebra. • Multiply a single term over a bracket and factorise a linear expression. • Use functions machines. • Understand and use the concepts and vocabulary of identities. • Expand and simplify over two linear brackets. • Expand a double bracket. • Factorise a quadratic expression where the coefficient of x^2 is 1 • Factorise an expression using the difference of two squares. • Forming quadratic expressions. • Form an expression to show the area and perimeter of complex shapes. • Rearrange formulae including fractions and powers to make a different variable the subject. • **Expand more than two brackets.** • **Factorise a quadratic expression where the coefficient of x^2 is greater than 1.** • **Simplify and manipulate algebraic expressions including algebraic fractions.** • **Rearrange formulae with the subject appearing twice to make a different variable the subject.** • **Algebraic proof.**	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.
Unit 4: Collecting Data and Averages	
Key Skills/ Knowledge: • Complete a tally chart. • Construct and complete frequency tables. • Create and complete grouped frequency tables. • Construct a data collection sheet. • Describe a population. • Complete construct and interpret two-way tables. • Finding averages from a list. • Finding a missing piece of data given the mean. • Finding the total from a frequency table. • Frequency trees. • Compare the mean, median, mode and range as appropriate of two distributions • Understand which measure of average is most appropriate and consider outliers. • Find averages from a bar chart and stem and leaf diagrams. • Finding averages from frequency tables (including grouped).	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.

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• Complete and interpret a table for time series data. • Understand and use all sampling methods including understanding their limitations. • Identify and suggest ways of eliminating sources of bias. • **Capture–recapture method.** • **Complete a cumulative frequency table.** • **Find quartiles and interquartile range.** • **Estimate averages from a histogram.**	
Unit 5: Types of Numbers	
Key Skills/ Knowledge: • Order negative integers. • Use negative numbers in context. • Calculate with negative numbers. • Give the positive and negative square root of a number • Find factors, multiples, HCF & LCM. • Identify primes, factors, multiples, common factors, and common multiples. • Understand divisors as factors • Square, cube and triangle numbers. • Use tests of divisibility • Prime factor decomposition including using product notation. • Use prime factor decomposition to find the HCF or LCM. • **Use prime factor decomposition to decide whether a number is square etc.**	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.
Unit 6: Percentages	
Key Skills/ Knowledge: • Convert between a percentage, fraction and decimal. • Find percentage of amounts without a calculator. • Find percentage of amounts using a calculator. • Increase/Decrease an amount by a percentage. • Interpret percentages as operators. • Write one number as a percentage of another. • Calculate the percentage change eg Profit/Loss. • Use multipliers to find a percentage of an amount and to increase and decrease by a percentage Find the original amount after a percentage change. • Use percentages to find the simple interest over a number of years. • Find the compound interest over a number of years. • Find compound depreciation. • **Use percentage scale factors to find the overall percentage change of multiple changes e.g. APR, why 10% followed by 10% is not a 20% change.**	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.

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Unit 7: Representing Data	

Key Skills/ Knowledge:
 	
• Identify correlation
• Construct, interpret and compare
  • Bar charts
  • Vertical line graphs
  • Pictograms
• Construct, interpret and compare
  • Time series
  • Frequency polygons
  • Pie charts
  • Stem and leaf
  • Scatter graphs
• Know that correlation does not indicate causation.
• Draw estimated lines of best fit and make predictions from scatter graphs
• Interpolate and extrapolate apparent trends and understand the dangers of doing so.
• Find the equation of a line of best fit and interpret it in context.
• **Construct, interpret and compare**
  • **Cumulative frequency diagrams**
  • **Histograms**
  • **Box plots**
	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.

Unit 8: Fractions, Decimals and Percentages	
Key Skills/ Knowledge: • Use fraction notation to describe parts of shapes • Convert between fractions, decimals and percentages. • Simplify and find equivalent fractions. • Finding a fraction of an amount. • Calculate with decimals. • Recognise common recurring decimals as fractions. • Multiply and divide number by powers of ten • Order fractions and decimals. • Calculate with fractions and mixed numbers. • Find reciprocals • Understand an effect of multiplying and dividing by a number between 0 and 1 • Write one number as a fraction of another • **Simplify and manipulate algebraic expressions including algebraic fractions.** • **Solve quadratic equations arising from algebraic fractions** • **Convert between recurring decimals & fractions.**	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.

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Unit 9: Substitution	
Key Skills/ Knowledge: • Substitute into an expression. • Use functions machines. • Substitute positive and negative integers into expressions and formulae, including scientific expressions. • **Work out a value in a formula when it is not the subject** • **Work with general iterative processes e.g. population growth or decay.** • **interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function' (the use of formal function notation is expected) (F and g notation)** • **Find composite and inverse functions.** .	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.
Unit 10: Sequences	
Key Skills/ Knowledge: • Find terms in a sequence. • Generate sequences given term to term, or an nth term. • Recognise and use triangular, square, cube and simple arithmetic progressions. • Calculate nth term of a linear sequence. • Recognise and use Fibonacci, quadratic and simple geometric progressions (rn where n is an integer and r is a rational number >0) sequence. • **Find the nth term of a quadratic sequence**	End of unit assessment – this will be marked, and the pupils will receive feedback in their books.