Year 9 **Foundation Curriculum Overview** **Subject: Mathematics**

Year 9 Overview:

Year 9 is the start of the GCSE course and students build upon the *core skills* learnt in Years 7 and 8 and extend their knowledge with new topics such as Pythagoras and Data Handling. Reasoning skills are developed to ensure understanding.

Autumn Term

Outline of Key Learning	Hegarty Code	Lesson
Indices, powers and roots (1c) a. Evaluate expressions involving squares, cubes and roots b. Add, subtract, multiply and divide numbers in index form c. Cancel to simplify a calculation d. Use index notation for powers of 10, including negative powers	151, 152,153 173 174 173,174	Types of numbers Rules of Indices
Factors, Multiples and Primes (1d) a. Find the prime factor decomposition of positive integers and write as a product using index notation b. Find common factors and common multiples of two numbers c. Find the LCM and HCF of two numbers, by listing, Venn diagrams and using prime factors: include finding LCM and HCF given the prime factorisation of two numbers d. Solve simple problems using HCF, LCM and prime numbers	29,30 31,32 35,167 LCM:34,35,36 HCF: 31,32,167	Factors, multiples and primes HCF and LCM
Pythagoras (12) a. Understand, recall and use Pythagoras' Theorem in 2D, including leaving answers in surd form b. Apply Pythagoras' Theorem with a triangle drawn on a coordinate grid	498-504	Pythagoras Theorem 1

Expanding and Factorising expressions (2a, 2b) a. Manipulate and simplify algebraic expressions by collecting 'like' terms b. Use index notation when multiplying or dividing algebraic terms c. Write and simplify expressions using squares and cubes; d. Simplify expressions involving brackets, i.e. expand the brackets, then add/subtract e. Recognise factors of algebraic terms involving single brackets f. Factorise algebraic expressions by taking out common factors	156, 157 168,169 170,171	Simplify Expressions Multiplying Terms Expand and simplify brackets Factorising (single bracket)
Expressions and substituting into formulae (2c) a. Substitute numbers into expressions involving brackets and powers b. Substitute positive and negative numbers into expressions c. Derive a simple formula, including those with squares, cubes and roots d. Substitute numbers into a formula	155,782,785 784 783	Substitution and rearranging formulae

Spring Term		
Outline of Key Learning	**Hegarty Code**	**Lesson**
Representing Data (3a, 3b) a. Sort, classify and tabulate data for grouped, discrete and continuous data, use inequalities for grouped data, and introduce ≤ and ≥ signs b. Construct tables for time–series data c. Work out time taken for a journey from a timetable d. Design and use two-way tables for discrete and grouped data e. Draw and interpret; pictograms, dual bar graphs, line graphs, histograms with equal class widths and stem and leaf	392, 393 450 - 452 422 – 433	Time Series and 2-Way Tables Tables, Bar Charts, Pictograms

Fractions (4a) a. Compare fractions, use inequality signs, compare unit fractions b. Convert between mixed numbers and improper fractions c. Add and subtract fractions and write the answer as a mixed number d. Multiply and divide an integer by a fraction	60 63 – 66 67 70, 72	+/- Fractions +/- Mixed Numbers x/÷ Fractions
Fractions, Decimals and Percentages (4b) a. Compare and order fractions, decimals and integers, using inequality signs b. Express a given number as a percentage of another number c. Convert between fractions, decimals and percentages d. Order fractions, decimals and percentages	46 52, 55 82, 83	FDP Equivalents
Percentages (4c) a. Calculate amount of increase/decrease b. Use percentages to solve problems, including comparisons of two quantities using percentages c. Use percentages in real-life situations, including percentages greater than 100% d. Use a multiplier to increase or decrease by a percentage in any scenario where percentages are used	88 – 90 97, 98	Percentages Percentage Increase/Decrease
Pie Charts & Scatter graphs (3c, 3d) a. Construct pie charts for categorical data and discrete/continuous numerical data b. Interpret simple pie charts using simple fractions and percentages c. Understand that the frequency represented by corresponding sectors in two pie charts is dependent upon the total populations represented by each of the pie charts d. Draw and Interpret scatter graphs e. Draw the line of best fit on a scatter diagram by eye, and understand what it represents f. Use the line of best fit make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing	424 – 426 427 – 429 453, 454	Pie Charts Scatter Graphs and Correlation

Summer Term		
Outline of Key Learning	**Hegarty Code**	**Lesson**
Equations and Inequalities (5a, 5b) a. Solve linear equations, with integer coefficients, in which the unknown appears on either side or on both sides of the equation b. Solve linear equations which contain brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution c. Rearrange simple equations d. Substitute into a formula, and solve the resulting equation e. Show inequalities on number lines and write down whole number values that satisfy an inequality f. Solve an inequality such as $-3 < 2x + 1 < 7$ and show the solution set on a number line g. Use inequality notation to specify simple error intervals due to truncation or rounding	186 287 265-6 268	solving linear equations equations with brackets rearrange equations inequalities on a number line solving inequalities
Sequences (5c) a. Find the nth term for a pattern, linear and arithmetic sequence b. Use the nth term of an arithmetic sequence to decide if a given number is a term in the sequence, or find the first term over a certain number c. Continue a geometric progression and find the term-to-term rule, including negatives, fraction and decimal terms; d. Continue a quadratic sequence and use the nth term to generate terms	198 247	finding nth term nth term in descending patterns continuing quadratic sequences
Properties of Shapes, angles in polygons (6a. 6b) a. Classify quadrilaterals and triangles by their geometric properties b. Use geometrical language appropriately and give reasons for angle calculations c. Calculate and use the sums of the interior angles of n-sided polygons d. Explain why some polygons fit together and others do not	823-6 561-2 812-4	quadrilaterals/triangles finding missing angles interior angles fitting shapes together