YEAR 9: AUTUMN TERM

	STARTER ACTIVITY OBJECTIVES From previous teaching programmes.	**CORE** From the Level 8 teaching programme	**EXTENSION** From future teaching programmes.
Number 1 (3 hours) Proportional Changes	• Use percentage changes to solve problems. • Interpret and use ratio in range of contexts. • Recognize when fractions or percentages are needed to compare proportions and solve problems. ***Investigation 2:2 p34.***	• Calculating original quantities after proportional changes. ***Ex 3:2 p63-65.*** • Repeated proportional changes. ***Discussion Ex 3:3 p65. Ex 3:4 p66-68.*** • Understand and use proportionality and calculate the result of any proportional change using multiplicative methods. ***Chapter Review p69-71.***	• Direct & indirect proportion
Algebra 1 (6 hours) Formulae and functions.	• Use formulae to generate sequences. • Find the next term and the nth term of linear sequences. • Find the next term and the nth term of quadratic sequences. • Find the next term and the nth term of other sequences.	• Transforming formulae. ***Discussion Ex 8:1 p158. Ex 8:2 p158/159.*** • Transforming formulae involving powers and roots. ***Discussion Ex 8:3 p160. Ex 8:4 p161/162.*** • Using formulae. ***Discussion Ex 8:5 p163. Ex 8:6 p163-165.*** • Expressing one formula in terms of another. ***Ex 8:7 p166.*** • Using function notation. ***Discussion Ex 8:8 p167. Ex 8:9 p167/168.*** ***Chapter Review p184-188 Q3,12,15,19.***	• Sequences defined iteratively. • Quadratic formula.
Handling data 1 (6 hours) Probability.	• Identify all the mutually exclusive outcomes of an experiment. • Know that the sum of all probabilities of all mutually exclusive outcomes is 1. • Estimate probabilities based on experimental data and use relative frequency as an estimate of probability.	• The addition principle. ***Ex 18:1 p440-441. Review 1 & 2 p441.*** • Independent events. ***Discussion Ex 18:2 p442-443.*** • The multiplication principle. ***Discussion Ex 18:3 p446. Ex 18:4 p446-448. Review 1 & 2 p448.*** • Using the addition & multiplication principles. ***Ex 18:5 p450-451. Review 1 & 2 p451. Investigation18:6 p451-452. Games 18:7 p453.*** ***Chapter Review p454-459.***	• Non mutually exclusive events (Venn diagrams). • Non independent events (with or without tree diagrams). • Conditional probability.
Shape, space and measures 1 (3 hours). Similar Shapes. **Investigation using IT** (3 hours)	• Construct triangles with ruler, protractor & compasses (SAS, ASA or SSS). • Pythagorean triples	• Recognising similar shapes. ***Discussion Ex 14:1 p332. Ex 14:2 p334-335.*** • Using similar shapes to find unknown lengths. ***Ex 14:4 p339-342.Investigation 14:6 p344.*** ***Chapter Review p345-348.*** • Solve substantial problems by breaking them into simpler tasks, using a range of efficient techniques, methods and resources, including ICT; use trial and improvement where a more efficient method is not obvious. ***My Rich Aunt.***	• Know from experience of constructing them that triangles given SSS, SAS, ASA & RHS are unique but SSA & AAA aren't.

YEAR 9: AUTUMN TERM

	STARTER ACTIVITY OBJECTIVES From previous teaching programmes.	**CORE** From the Level 8 teaching programme	**EXTENSION** From future teaching programmes.
Number 2 (6 hours) Standard Form.	• Multiplying and dividing powers. • Calculating with powers of the same number.	• Negative Powers. ***Discussion Ex 6:1 p103. Ex 6:2 p103. Discussion Ex 6:3 p104.*** • Standard Form. ***Ex 6:4 p106-107.*** • Multiplying and dividing numbers in standard form. ***Ex 6:5 p108-110. Discussion Ex 6:6 p111.*** • Adding and subtracting numbers in standard form. ***Discussion Ex 6:7 p111. Ex 6:8 p111-112.*** • Using the calculator to work in standard form. ***Discussion Ex 6:9 p113. Ex 6:10 p114.*** ***Chapter Review p115-119.***	
Algebra 2 (6 hours) Straight line graphs y = mx + c.	• Recognize that equations of the form y = mx + c correspond to straight line graphs. • Use a graphical method to solve simultaneous equations.	***Investigation 9:1 p190. Discussion Ex 9:2 p192/193. Ex 9:3 p193-196.*** • The line equation y = mx + c. ***Ex 9:5 p200/201.*** • Rearranging line equations into the form y = mx + c. ***Discussion Ex 9:6 p203. Ex 9:7 p203/4.*** • Horizontal and vertical lines. ***Discussion Ex 9:9 p205.*** • Finding equations of given lines. ***Ex 9:10 p207/8.*** ***Chapter Review p209-212.***	• Graphs of curves. • Using graphs to solve equations. • Graphs of lines related by translation, reflection and enlargement.
Shape, space and measures 2 (6 hours) Trigonometry.	• Pythagoras' Theorem. • Bearings-from scale drawing and from calculation.	• Naming the sides of a triangle. ***Investigation & Discussion Ex 15:1 p350. Ex 15:2 p352.*** • The ratios sine, cosine and tangent. ***Discussion Ex 15:3 p353/354. Ex 15:4 p355. Ex 15:5 p356.*** • Finding the length of a side of a right angled triangle. ***Ex 15:7 p359-361. Review 1 & 2 p362.*** • Finding the size of an angle. ***Discussion Ex 15:8 p362. Ex 15:9 p364/365.*** • Applications of Trigonometry. ***Ex 15:11 p367/368. Ex 15:12 p370-373.*** ***Chapter Review p374-380.***	• Similar and congruent triangles. • Trigonometry in 3D. • Calculations with non right angled triangles.
Handling Data 2 (3 hours) Cumulative Frequency	• Mode, median, mean and range.	• Analysing data using quartiles and IQR. ***Discussion Ex 17:1 p415. Ex 17:2 p416. Review 1 & 2 p417.*** • Cumulative frequency graphs. ***Ex 17:3 p420-424. Discussion Ex 17:4 p426. Ex 17:5 p428/429.*** ***Chapter Review p430-436.***	• Comparing sets of data. • *Standard deviation.*

YEAR 9: SPRING TERM

	STARTER ACTIVITY OBJECTIVES From previous teaching programmes.	**CORE** From the Level 8 teaching programme	**EXTENSION** From future teaching programmes.
Number 3 (6 hours). Calculation.	• Multiplying and dividing by numbers between 0 and 1. • Enter directed numbers and perform calculations using the four operations. • Solve linear equations with negative solutions.	• Calculating with powers and roots. ***Puzzle 5:1 p82. Ex 5:2 p84.*** • Evaluating formulae (involving decimals, fractions and decimals) ***Ex 5:3 p86-89.*** • Calculating with indices involving the use of the rules of indices. ***Ex 5:6 p92/93. Investigation 5:7 p94.*** • Finding reciprocals and using them to solve equations. ***Discussion Ex 5:8 p94. Ex 5:9 p95. Ex 5:11 p97.*** ***Chapter Review p98-101.***	• Zero, negative and fractional indices. • Fractional and decimal forms of numbers. • Rational and irrational numbers.
Algebra 3 (6 hours) Expressions and Quadratic Functions.		• Expanding algebraic expressions of the form px(ax+by). ***Ex 8:11 p171. Review 1 & 2 p171.*** • Factoring algebraic expressions into the form px(ax+by). ***Ex 8:13 p173/174. Review p174.*** • Expanding algebraic expressions of the form (px+qy)(ax+by), simplifying the result. ***Ex 8:15 p176. Review p176.*** • Factorising quadratic equations. ***Ex 8:17 p178/179. Review p179.*** • Solving quadratic equations and solving problems that involve quadratic equations. ***Ex 8:19 p181. Ex 8:20 p182-184.*** ***Chapter Review p184-188..***	• Solving quadratics where the squared coefficient is not 1. • Factorising by grouping.
Solving problems and investigation (6 hours)	• Identify the necessary information to solve a problem.	• Solve increasingly demanding problems and evaluate solutions; explore connections in mathematics across a range of contexts: number, algebra, shape, space and measures, handling data. ***Investigation 1:1 p33. Discussion Ex 1:2 p34. Ex 1:3 p38/39.*** ***Algebraic Investigation: Lines Crossovers & Regions.***	• Generate fuller solutions to increasingly demanding problems.

Revision Programme (15 hours)		• Practice KS3 papers (CGP papers & real past papers). • Use of Test Base material. • Chapter Review material. • CGP workbooks. ***KS3 SAT's***	

YEAR 9: SUMMER TERM

	STARTER ACTIVITY OBJECTIVES From previous teaching programmes.	**CORE** From the Level 8 teaching programme	**EXTENSION** From future teaching programmes.
Number 4 (6 hours). Fractions.	• Link ratio to fractional notation. • Recognise when fractions are needed to compare proportions and solve problems.	• Proper and improper fractions, mixed numbers. ***Discussion Ex 2:1 p42. Discussion Ex 2:2 p43. Ex 2:3 p43.*** • Multiplying fractions. ***Discussion Ex 2:4 p44/45. Ex 2:5 p46/47.*** • Dividing fractions. ***Discussion Ex 2:6 p47. Ex 2:7 p48/49. Investigation 2:8 p49.*** • Adding and subtracting fractions. ***Ex 2:9 p51.Discussion Ex 2:10 p52. Ex 2:11 p53.*** • Calculations using all four operations. ***Ex 2:12 p54/55. Ex 2:14 p57. Puzzle 2:15 p58.*** ***Chapter Review p58-60.***	• Rational and irrational numbers.
Algebra 4 (6 hours) Graphs of some special functions and real life situations.	• Plot the graphs of linear functions on paper. • General linear graph of the form y=mx+c.	• Plotting curves and exploring computer generated graphs. ***Investigation and discussion Ex 11:2 p237/238.*** ***<u>Use of omnigraph throughout this topic.</u>*** • Recognising graphs of linear, quadratic, cubic and reciprocal functions. ***Ex 11:4 p241-244.*** • Sketching graphs of linear, quadratic, cubic and reciprocal functions. ***Ex 11:7 p250. Investigation 11:8 p251.*** • Discuss and interpret a range of graphs arising from real life situations. ***Discussion Ex 11:9 p252. Ex 11:10 p253-255. Discussion Ex 11:13 p257-259. Ex 11:14 p259-262.*** ***Chapter Review p265-272.***	• Construct functions arising from real life situations and plot their corresponding graphs. • Using graphs to solve equations. • Using s-t and v-t graphs.
Shape, space and measures 3 (3 hours) Dimensions.	• Know and use the formulae for the area and circumference of a circle. • Calculate the volume of a prism and a cylinder.	• Dimensions for length area and volume. ***Discussion Ex 13:1 p323. Ex 13:2 p325/326.*** ***Chapter Review p327-330.***	• Similar shapes, scale factors and congruency.
Handling Data 3 (3 hours) Tree Diagrams.	• The addition and multiplication principles.	• Drawing tree diagrams. ***Discussion Ex 19:1 p462. Ex 19:2 463.*** • Using tree diagrams to calculate probability. ***Ex 19:3 p466-469.*** ***Chapter Review p470-472.***	• Tree diagrams for non independent events.

Any remaining time can be used to

- Review KS3 exams
- Undertake investigations.
- Touch on ideas that are of general interest and not necessarily within the National Curriculum.