THE ABBEY SCHOOL
A BUSINESS & ENTERPRISE ACADEMY

Mathematics

Year 9 Foundation
Scheme of Work

Subject leader: K Ellender

Topics by term	Topic overview for Year 9					
	Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Topics taught	**1F Number** 1a. Written calculations 1b. Decimals 1c. Place value 1d. Factors and multiples 1e. Squares, cubes and root 1f. Index notation Knowledge recall / Quiz	**2F Algebra** 2a. Simplifying expressions 2b. Expand & Factorise 2c. Substitution & Formulae 2d. Using Expressions and Formulae Knowledge recall / Quiz **3F Data** 3a. Frequency Tables 3b. Two Way Tables *Continue in Term 3 …*	**3F Data** 3c. Representing Data 3d. Time Series 3e. Stem & Leaf Diagrams 3f. Pie Charts 3g. Scatter diagrams Knowledge recall / Quiz **7F Averages** 7a. Averages from discrete data 7b. Averages from other representations 7c. Estimating averages 7d. Sampling Knowledge recall / Quiz	**4F Fractions and percentages** 4a. Working with Fractions 4b. Operating with Fractions 4c. Fractions & Decimals 4d. Fractions & Percentages 4e. Calculations with Percentages Knowledge recall / Quiz	**5F Equations and inequalities** 5a. Solving linear equations 5b. Further Linear equations 5c. Representing and solving inequalities 5d. Formulae 5e. Sequences Knowledge recall / Quiz	**6F Angles** 6a. Angle properties in Geometry 6b. Angles in parallel lines 6c. Angles in polygons 6d. Angle problems with algebra 6e. Pythagoras' Theorem Knowledge recall / Quiz

	Vital prerequisites	Vital prerequisites	Vital prerequisites	Vital prerequisites	Vital prerequisites	Vital prerequisites
	Year 7 and Year 8 number skills required. Simple addition, subtraction, multiplication and division skills. Students need to know what factors and multiples are and be comfortable in working with primes, squares, cubes and roots within calculations. Students should also have a solid understanding of what negative numbers are and what rules of addition, subtraction, multiplication and division there are.	Basic knowledge of function machines from Year 7 and Year 8. Understanding of collecting like terms, multiplication of basic algebraic terms including those of higher powers and division of algebraic terms. Year 7 and 8 expanding and factorising into a single bracket. Substituting positive and negative numbers into simple formulae covered in Year 7	**3F – Data** Pie charts introduced in term 1 of year 8. Basic pie charts drawn and interpretations made with simpler diagrams. Scatter graphs in Year 8 (Term 2) are looked at and correlation is discussed. Links with Time Series very well. Stem and leaf also looked at in Year 8 and are built on in Year 9. Students will look at using stem and leaf diagrams to find averages from a set of data. **7F – Averages** Averages last looked at in Year 7 and are seen for the first time (explicitly) during this term. Students are expected to know the difference between the mean, median, mode and range and should be able to calculate them from a simple list of data.	Topics 4 and 5 in Year 7 Topics 6, 8 and 9 in Year 8 Students should have an understanding of the equivalence of fractions, decimals and percentages and should be able to carry out simple calculations with fractions and decimals. This includes mixed numbers. They should also be able to calculate percentages with or without a calculator.	**Year 7, Term 2 – Expressions, functions and formulae.** Students should be comfortable with function machines, simplifying expressions, writing expressions, substituting into formulae and writing formulae. **Year 8, Term 3, Topic 4 – Expressions and equations.** Students should have covered algebraic powers, expressions and brackets, factorising expressions, one and two-step equations.	**Year 7, Term 5, Topic 8 – Lines and Angles** Students should have covered measuring and drawing angles, angle facts, accurate drawings and labelling angles and sides. *Understanding of solving equations will also be needed from Year 8* **Year 8, Term 5, Topic 7 – Lines and angles** Students should have covered angles in parallel lines, exterior and interior angles of polygons, solving more complex geometric problems and constructions.
	Why are we teaching this now?	**Why are we teaching this now?**	**Why are we teaching this now?**	**Why are we teaching this now?**	**Why are we teaching this now?**	**Why are we teaching this now?**
	Links to harder topics in later years. Students need to be able to work in standard form (Year 11) and carry out calculations with larger numbers. Index notation links to laws of indices and solving harder linear equations. Powers of two and three link to quadratic and cubic graphs.	Links to solving linear equations chapter (Y9 Term 5) Harder algebra topics will be seen in years 10 and 11 such as expanding and factorising quadratic equations, solving equations involving algebraic fractions, substituting into the quadratic formula and using the nth term of a sequence.	**3F – Data** Reading graphs in every-day life is essential. Many forms of a graph/diagram are presented to students and they need to know how to read them. Furthermore, being able to read and unpick harder graphs link together with Science well where they need to present their data/findings in a variety of ways. **7F - Averages** Taught early in year 9 to develop the problem solving aspect that tends to appear in GCSE questions. Links to other topics such as frequency polygons and cumulative frequency diagrams.	**Year 11, Term 1, Chapter 18F – Fractions, indices and standard form.** Students practise calculations with mixed numbers early into term 1. They need to understand the idea of a reciprocal. **Year 10, Term 4, Chapters 14F – Multiplicative Reasoning.** Students will need a fundamental understanding of percentages so that they can tackle problems involving growth and decay, compound interest, simple interest, compound measures and direct and inverse proportion.	**Year 10, Term 2, Chapter 9F – Linear graphs.** Students need to be comfortable with substitution so that they are able to successfully plot a linear graph. **Year 11, Term 2, Chapter 16F – Quadratic Equations.** Students will eventually need to be able to expand a quadratic, factorise a quadratic, plot a quadratic graph and solve a quadratic equation. **Year 11, Term 4, Chapter 20F – Further algebra** Students need a fundamental understanding of algebra to access this chapter, which looks into non-linear graphs, simultaneous equations, changing the subject and mathematical arguments.	**Year 10, Term 1, Chapter 8F – Perimeter, Area and Volume.** Students may be asked to apply their knowledge from this chapter in Year 9 to assist with their first topic in Year 10. Students may require Pythagoras/Trigonometry to calculate a missing length to then calculate a perimeter, area or volume. **Year 10, Term 4, Chapter 12F – Right Angled Triangles** Students need to cover Pythagoras' Theorem again as well as trigonometric ratios, exact angles and harder trigonometry problems. This chapter is then revised again in Term 1 of Year 11.

Contents

This symbol indicates that there are aspects of this curriculum area that pupils have previously practised. Pupils will be revisiting earlier content as part of their consolidation or in order to ensure knowledge is secure before expanding into new learning. References to these earlier SOL are noted for teachers to check specific objectives and content.

Edexcel Foundation 1MA1							
Specification References	**Big questions**	**Topic area: Main Items**	**Learning Objectives /Outcomes** **All: grades 1-3** **Most: grades 4-5** **Examples**	**Key Terms/ concepts Literacy Numeracy**	**Assessment and homework tasks**	**Resources**	**Personal Development Curriculum links (SMSC, British Values, PSHE)**
Term 1							
	Topic 1: Ch1 - Number (6 weeks)						
N1 N3 N6	How do you calculate with ANY number? Yr7, Yr8 Ch1, 6	1a. Written calculations 1b. Decimals	Apply the four operations, including formal written methods. Use priority of operations with positive and negative numbers, including basic calculations with negative numbers. Simplify calculations by cancelling and use inverse operations. Recognise and understand symbols such as =, <, >, ≠, √ Add, subtract, multiply and divide decimal numbers. Divide by a decimal number. **Gatsby Benchmarks: Careers** Use real-life contexts with basic integer and decimal calculations wherever possible to help students to engage and relate learning to everyday and working life. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)	Integer BIDMAS Root Square Cube Decimal place Round Significant Estimate Multiple, Factor Prime, Product HCF, LCM, Power Square, Cube Root, Surd Base, Index, Power See command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • The four operations, including decimals and negatives. • Calculating using the order of operations Practical problems involving all four operations. Multistep problems in a range of real-life scenarios such as money and costs with reasoning, where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Purposeful Practice Book Ch1F • Edexcel Foundation Linear Course Text Book Ch1 • Edexcel Higher Linear Course Text Book Ch1 • Common misconception information Scientific calculators Directed numbers drills - Directed Number Patterns (mathsbot.com) Year 9 Term 1 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment. Make 100 (Nrich)	By maintaining high standards of behaviour, including mutual respect and tolerance for different ideas to their own, class teachers will be promoting British values. Throughout the year, students should be encouraged to actively listen to understand the viewpoint of others when learning involves opinions, interpretation of fact and alternative methods. **Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in personal finance/planning. Relatable examples within the context of outcomes listed could include: Calculating with money as

						Key & exemplar questions – WRM - SOL topics	decimals for costs, profits and unit prices. Bank accounts and budgeting/financial planning with basic arithmetic.
N2 N13, N14, N15	How and why do we estimate? Yr7, Yr8 Ch 6	1c. Place value	Round to the nearest integer; Round to a given number of decimal places Round to a given number of significant figures. Estimate answers to calculations. Use one calculation to find the answer to another.		Pupils are expected to complete purposeful exercises and repeated practice on: • Rounding to decimal places • Rounding to significant figures • Estimating answers by rounding Practical problems involving estimating. Multistep problems in a range of real life scenarios such as money and costs with reasoning, where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Purposeful Practice Book Ch1F • Edexcel Foundation Linear Course Text Book Ch1 • Edexcel Higher Linear Course Text Book Ch1 • Common misconception information Scientific calculators Key & exemplar questions – WRM - SOL topics Year 9 Term 1 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.	**Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in personal finance/planning. Relatable examples within the context of outcomes listed could include: Long term and short term savings and budgeting projections with estimating and rounding. Cost calculations with estimating,
N4 N5 N3 N6 N7	How do you use primes and powers?	1d. Factors and multiples	Recognise 2-digit prime numbers. Write a number as the product of prime factors in index notation. Find factors and multiples of numbers. Find common factors and common multiples of two numbers.		Pupils are expected to complete purposeful exercises and repeated practice on: • Finding the prime factor decomposition	• Purposeful Practice Book Ch1F • Edexcel Foundation	

	Yr7, Yr8 Ch1	1e. Squares, cubes and root 1f. Index notation 1.g Standard form (If required)	Find the HCF and LCM of two numbers. Find the HCF and LCM by listing, Venn diagrams and using prime factors: include finding LCM and HCF given the prime factorisation of two numbers; Find square roots and cube roots. Understand the relationship between squares, cubes and roots. Evaluate expressions involving squares, cubes and roots: -add, subtract, multiply and divide numbers in index form; -cancel to simplify a calculation; Recognise powers of 2, 3, 4 and 5. Understand surd notation on a calculator. Use index notation for powers of 10 Use the laws of indices Convert numbers into standard form and vice versa;		• HCF and LCM • Finding squares, cubes and roots of numbers • Using the different laws of indices Multistep problems in a range of real life scenarios such as timetables, packaging with the uses of multiples. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Linear Course Text Book Ch1 • Edexcel Higher Linear Course Text Book Ch1 • Common misconception information Key & exemplar questions – WRM - SOL topics Scientific calculators Manipulatives for prime number representations and multiplication Prime Factor Tiles (mathsbot.com) Visual representation between HCF and LCM composition - Prime Factors, HCF and LCM (mathsbot.com) Consecutive Chains Problem (Resoureaholic) Sieve of Eratosthenes (mathsbot.com) Year 9 Term 1 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3	**Gatsby Benchmarks: Careers** Use real-life contexts multiple/factor calculations wherever possible to help students to engage and relate learning to everyday and working life e.g. bus routes and transportation planning, packaging calculations with LCM. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)

						style questions for assessment.	
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Multiple operations Missing digits Counter arguments Mental methods when dividing by decimals Emphasis on presentation for multistep problems Entering negative numbers correctly into the calculator			Knowledge Recall Lesson – Unit 1 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch1F Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 2							
	Topic 2: Ch2 – Basic algebra (4 weeks)						
A1 A4 N1 N4 A1 A3 A4 A6	How do we use and interpret algebraic expressions ? Yr7, Yr8 Ch4	2a. Expressions and Simplifying 2b. Expanding brackets and Factorising	Use correct algebraic notation. Write and simplify expressions. Use the index laws algebraically. Multiply and divide expressions. Multiply a constant over a single bracket. Simplify expressions with more than one bracket. Recognise factors of algebraic terms. Factorise algebraic expressions. Use the identity symbol ≡ and the not equals symbol ≠	Expression, identity, term, 'like' terms, index, power, collect, substitute, , linear, simplify expand, bracket, factor, factorise equation, formula, substitute expression, formula, See command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Collecting like terms and simplifying by multiplying • Expanding and factorising single brackets. Practical problems involving the representations of everyday situations algebraically. Plenary style questions – White Rose Maths - Assessment Papers	• Pearson's GCSE Maths F 9-1 Textbook: Ch2F • Purposeful Practice Book Ch2F • Edexcel Higher Linear Course Text Book Ch5 • Common misconception information Manipulatives for algebraic representations and multiplication - Algebra Tiles (mathsbot.com) Algebra Discs (mathsbot.com) Year 9 Term 2 Knowledge Organiser for key terms, recall and low stakes quizzing.	**Gatsby Benchmarks: Careers** Use expressions to represent real life situations to help students to engage and relate algebra to everyday and working life. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)

					https://www.missbsresources.com/ > Algebra > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets Key & exemplar questions – WRM - SOL topics	Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment. Like terms search - @sgiekAHS Find the gaps - Median Don Steward Factorising worksheet – UEA	
A1 A2 A7 A21 A5	What is a formulae and how do we use them in Science? Yr7 Ch3	2c. Substitution and formulae 2d. Using Expressions and Formulae	Substitute numbers into expressions. Recognise the difference between a formula and an expression Substitute numbers into expressions with brackets and powers. **The Abbey Lens:** **Science – Formulae in physics** **Sports Science – BMI formula.** Substitute numbers into a simple formula. **USE THE SCIENTIFIC FORMULAE SHEET – SET 1.** Write expressions and simple formulae to solve problems. **It may be possible to introduce solving simple equations or the expansion of double brackets at this stage if pupils are confident in preparation for Ch5.**		Pupils are expected to complete purposeful exercises and repeated practice on: • Substituting into expressions and formulae • Writing expressions and formulae from real life situations Practical problems involving the use of science formulae. GCSE PHYSICS Equations - A complete printable list - GCSE SCIENCE Multistep problems in a range of real life scenarios involving the calculation of values from formulae. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Algebra > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Pearson's GCSE Maths F 9-1 Textbook: Ch2F • Purposeful Practice Book Ch2F • Edexcel Higher Linear Course Text Book Ch5 • Common misconception information Year 9 Term 2 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment. Key & exemplar questions – WRM - SOL topics	
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation.			Knowledge Recall Lesson –	

			The problems in the textbook should be used, as well as exam style questions. Further examples could include, but should not be limited to: Contextual algebra, Vocabulary differences in questions Lots of concrete examples when writing expressions, e.g. 'B' boys + 'G' girls. Plenty of practice should be given and reinforce the message that making mistakes with negatives and times tables is a different skill to that being developed. Include substitution into the kinematics formulae given, i.e. $v = u + at$, $v^2 - u^2 = 2as$, and $s = ut + \frac{1}{2}at^2$.			Unit 2 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch2F Knowledge Quiz – Shared area		
Begin Topic 3: Ch3 – Graphs tables and charts							
	Topic 3: Ch3 - Graphs, tables and charts (2 weeks + 3 weeks)						
G14, S2, S4, S5 S6	How can you extend your knowledge of displaying data from year 7 and 8? Yr7, Yr8 Ch3	3a. Frequency Tables 3b. Two Way Tables	Recognise types of data: primary secondary, quantitative and qualitative, discrete and continuous. Design and use data-collection sheets for grouped, discrete and continuous data, use inequalities for grouped data, and introduce ≤ and ≥ signs; Interpret and use distance tables/timetables. Complete two-way tables for a data set / problem. Construct two-way tables for a data set / problem		See details below.	See details below.	**Gatsby Benchmarks: Careers** Use real-life contexts wherever possible to help students to engage and relate learning to everyday and working life, and explore representing the world in a Mathematical way. All graphical representations should be able to be given a context or career link in this unit. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 3							
	Topic 3: Ch3 - Graphs, tables and charts (2 weeks + 3 weeks)						
G14, S2, S4, S5 S6	How can you extend your knowledge of displaying data from	3c. Representing Data	Draw and interpret comparative/composite bar charts. Interpret and compare data shown in a bar/line chart. Identify errors in charts. **Abbey Lens:**	Discrete, continuous, mean, average, greater than, less than, qualitative, quantitative, probability	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.**	• Pearson's GCSE Maths F 9-1 Textbook: Ch3F · • Purposeful Practice Book Ch3F	**SMSC and BV** Use recent and relevant statistical representations in the media for discussion and context.

	year 7 and 8?  Yr7, Yr8 Ch3	3d. Time Series 3e. Stem and Leaf Diagrams 3f. Pie Charts 3g. Scatter diagrams	**Geography – Tables and charts to show population increases/decreases over time.** **Business – Tables and charts to show consumer habits.** **History – Historical trends.** Produce line graphs for time–series data. Interpret trends from time series data. Construct stem and leaf diagrams and back to back stem and leaf diagrams. Draw circles and arcs to a given radius; Construct pie charts for categorical data and discrete/continuous numerical data; Interpret simple pie charts using simple fractions and percentages; From a pie chart: find the mode; find the total frequency; 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. Plot and interpret scatter graphs. Identify outliers and ignore them on scatter graphs; Draw the line of best fit on a scatter diagram by eye, and understand what it represents; Use the line of best fit make predictions; interpolate and extrapolate apparent trends whilst knowing the limitations; Distinguish positive, negative and no correlation using LOBF. Use LOBF to predict values of variables given values of another; Interpret scatter graphs in terms of the relationship between two variables; Interpret correlation in terms of the problem; Understand that correlation does not imply causality; State how reliable their predictions are, i.e. not reliable if extrapolated. **Abbey Lens:** **Science – Scientific data. Explore key differences in LOBF between science and Maths.**	mean, median, mode, range, average, , data, trend, sample, population, estimate stem and leaf, frequency, table, sort pie chart, scatter graph, line of best fit, correlation, positive, negative,	Pupils are expected to complete purposeful exercises and repeated practice on: • Drawing charts and tables to represent data • Using charts and tables to interpret data Multistep problems in a range of scenarios with graphical readings and interpretation to form reasoning where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Data > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Edexcel Higher Linear Course Text Book Ch11 • Common misconception information Scientific calculators Printed tables and charts (E.g. printed pie charts, bar chart templates, etc) Year 9 Term 3 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment. Mathsjam Jars – nrich On the Road – nrich Bee aware – Median Don Steward Key & exemplar questions – WRM - SOL topics	Home - Office for National Statistics (ons.gov.uk) Initial opportunities to discuss data connections to individual liberty and the rule of law. Activity 1.1 - Democracy and Law – General Elections British values maths resources **Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in the personal financial planning. Re latable examples within the context of outcomes listed could include: Interpreting and plotting graphs in financial contexts

		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. The problems in the textbook should be used, as well as exam style questions. Further examples could include, but should not be limited to: Misleading tables and graphs, Contextual data, Comparing pie charts, Decision for the most appropriate chart or table given a data set. State the mode, smallest value or largest value from a stem and leaf diagram. Constant reminders of the importance of drawing a line of best fit. Support with copy and complete statements, e.g. as the ___ increases, the ___ decreases.			Knowledge Recall Lesson – Unit 3 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch3 Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
	Topic 4: Ch7 – Averages (2 weeks)						
S2, S4, S1	How can you use your knowledge of averages for tables and charts? Yr7 Ch1	7a. Averages from discrete data 7b. Averages from other representations 7c. Estimating averages 7d. Sampling	Calculate the mean mode, median and range from a list. Compare sets of data using the mean and range. Identify outliers. Recognise the advantages and disadvantages of each type of average. Find the mode, median and range from a stem and leaf diagram. Find the median from a frequency table. Calculate the mean from a frequency table. Estimate the mean of grouped data Estimate the range from a grouped frequency table. Find the modal class, Understand that the expression 'estimate' will be used where appropriate, when finding the mean of grouped data using mid-interval values Recognise types of data: primary secondary, quantitative and qualitative, know which type of representation is appropriate; Understand how data sources may be biased & how to avoid it;	Mean, median, mode, range, average, outlier, stem and leaf, key, frequency, frequency, table, estimate, class, midpoint discrete, continuous, qualitative, quantitative, data, sample, population, bias, primary, secondary, interval,	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Finding the mean, median, mode and range • Designing data sets to meet average criteria values • Finding averages from frequency tables Multistep problems in a range of scenarios with reasoning, where necessary.	• Pearson's GCSE Maths F 9-1 Textbook: Ch7F • Purposeful Practice Book Ch7F • Edexcel Higher Linear Course Text Book Ch11, 17 • Common misconception information Scientific calculators Year 9 Term 3 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on	**SMSC and BV** Maths and the use of data have a significant role in democratic decision-making and influencing change. Students may hear statistics quoted to justify and argue for particular positions. The development of critical thinking skills using maths will help build student resilience and provides many opportunities to explore democracy and the rule of law. This may take the form of studying general or local election results, where relevant or simply just analysing the use of each 'average' to determine the advantages / disadvantages. Students should be encouraged to

			Understand the need for sampling and why a sample may not be representative of a population; **Abbey Lens:** **Opportunity to use 'averages' in the context of other subject areas. E.g. Scientific data, Geographical averages** Our World in Data		Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Data > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets Key & exemplar questions – WRM - SOL topics	practice questions and AO1/AO2/AO3 style questions for assessment. Mean from a list of data - algebra - Craig Barton via variationtheory.com Venn rich tasks - mathsvenns.com Wipe out - Median Don Steward	share and explore various opinions.
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. The problems in the textbook should be used, as well as exam style questions. Further examples could include, but should not be limited to: State the median, mode, mean and range from a small data set. Extract the averages from a stem and leaf diagram. Estimate the mean from a table of various scenarios.			Knowledge Recall Lesson – Unit 7 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch7 Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 4							
	Topic 5: Ch4 – Fractions and percentages (6 weeks)						
N1, N2, N3, N12, R3, S2, N8, N10, R9	How do we perform the 4 operations with fractions? Yr7, Y 8 Ch8	4a. Working with Fractions 4b. Operating with Fractions	Use diagrams to find equivalent fractions or compare fractions; Write fractions to describe shaded parts of diagrams; Express a given number as a fraction of another, using very simple numbers, some cancelling, and where the fraction is both < 1 and > 1; Write a fraction in its simplest form and find equivalent fractions; Order fractions, by using a common denominator; Compare fractions, use inequality signs, compare unit fractions; Convert between mixed numbers and improper fractions; Add and subtract fractions. Multiply whole numbers, fractions and mixed numbers.	Decimal, percentage, inverse, addition, subtraction, multiplication, division, fractions, mixed, improper, recurring, integer, decimal, terminating, VAT, increase, decrease, multiplier, profit, loss See command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Using the four operations involving fractions.	• Pearson's GCSE Maths F 9-1 Textbook: Ch4F · • Purposeful Practice Book Ch4F • Edexcel Higher Linear Course Text Book Ch4, 7, 12 • Common misconception information Key & exemplar questions – WRM - SOL topics	**SMSC & BV** Activity 2.2– Respect and Liberty. If Britain were 100 people. (Involves FDP calculations) .British values maths resources **Gatsby Benchmarks: Careers** Use real-life contexts with fractions wherever possible to help students to

		4c. Fractions with Decimals	Simplify calculations by cancelling. Divide a whole number by a fraction. Divide a fraction by a whole number or a fraction. Convert fractions to decimals and vice versa. Use decimals to find quantities. Write one number as a fraction of another.		• Use the four operations with mixed numbers • Convert fractions and decimals Practical problems involving the use of fractions in everyday situations. Multistep problems in a range of scenarios with reasoning, where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Scientific calculators Manipulatives for fraction representations and relations to equivalents - Fraction Wall (mathsbot.com) Year 9 Term 4 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment. Fraction Practice, magic squares – Median Don Steward. Countdown Fractions – nrich. Folding Fractions - nrich	engage and relate learning to everyday and working life. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)
N12, R9	How can you use and apply your knowledge of percentages to the real world? Yr7, Yr8 Ch10	4d. Fractions with Percentages 4e. Calculations with Percentages	Convert percentages to fractions and vice versa. Write one number as a percentage of another. Convert percentages to decimals and vice versa. Find a percentage of a quantity, including over 100. Using multipliers Use percentages to solve problems. Calculate simple interest Calculate percentage increase/decrease with multipliers. Use percentages in real- life situations. Calculate VAT. Calculate simple interest and income tax. Calculate percentage change.		Pupils are expected to complete purposeful exercises and repeated practice on: • Convert fractions, decimals and percentages • Calculate percentages of amounts, increases and decreases (with and without multipliers) Practical problems involving the use of fractions and	• Pearson's GCSE Maths F 9-1 Textbook: Ch4F · • Purposeful Practice Book Ch4F • Edexcel Higher Linear Course Text Book Ch4, 7, 12 • Common misconception information Scientific calculators	**Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in personal finance/planning. Relatable examples within the context of outcomes listed could include: Percentages – including taxation,

			If you have additional lessons, you may wish to extend ratio work, as listed in the year 9H SOL.		percentages in everyday situations. Multistep problems in a range of scenarios with reasoning, where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Manipulatives for fraction equivalents representations and relations to equivalents - Fraction Wall (mathsbot.com) Year 9 Term 4 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.	sales, inflation, interest rates, loans. Percentage change problems including price and salary changes. **SMSC & BV** Students might explore and discuss the extent of individual liberty bearing in mind legal constraints that are numerical in nature, e.g.,taxation levels, or the financial links to education choices and careers.
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. The problems in the textbook should be used, as well as exam style questions. Further examples could include, but should not be limited to: Shading diagrams, where the partitioning does not match the fraction needed. Use of the fractions button on the calculator Use of real life examples where possible. Comparisons of values involving fractions, decimals and percentages. Banking calculations and comparison questions. Reading information from a variety of tables and diagrams, particularly for special offers.			Knowledge Recall Lesson – Unit 4 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch4 Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 5							
	Topic 6: Ch5 – Equations and inequalities (6 weeks)						
N1, A3, A5, A17, A21, N15, N16, A7 A7, A23, A24, A25 , A22,	How can we use and interpret expressions, equations and sequences? Yr8 Ch4	5a. Solving linear equations 5b. Further Linear equations	Identify an expression/equation/formula/identity Understand and use inverse operations. Use a function machine. Rearrange simple linear equations Two step solving equations Solve linear equations, with integer coefficients, in which the unknown appears on either side or on both sides of the equation;	solve, represent, substitute, bracket, expand, linear, equation, balance, accuracy inequality, solve, represent, integer, substitute, change, subject, expression, identity, equation,	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful	• Pearson's GCSE Maths F 9-1 Textbook: Ch5F · • Purposeful Practice Book Ch5F • Edexcel Higher Linear Course	**Gatsby Benchmarks: Careers** Use repeated reinforcement that a situation with an unknown variable can be represented and solved with an algebraic equation

		5c. Representing and solving inequalities 5d. Formulae 5e. Sequences	Solve linear equations which contain brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution; Solve linear equations in one unknown, with integer or fractional coefficients; Use correct notation to show inclusive and exclusive inequalities. Solve simple linear inequalities. Write whole numbers, which satisfy an inequality. Represent inequalities on a number line. Solve two sided inequalities Substitute values into a formula to solve equations. Change the subject of the formula. **USE THE SCIENCE FORMULAE SHEET. (Equation set 1 and 2)** Know the difference between an expression, equation and identity. **The Abbey Lens:** **Science – Use scientific formula required for GCSE.** Recognise and extend sequences Use the nth term to generate terms of a sequence. Find the nth term of an arithmetic sequence	arithmetic, geometric, function, sequence, *n*th term, derive, quadratic, triangular, cube, square, odd, even, See command words.	exercises and repeated practice on: • Solving equations involving one step, two steps and fractions. • Solving equations with brackets and with variables on both sides. • Express inequalities on number lines and vice versa. • Solving linear inequalities • Solving double inequalities. • Substitution into a formula • Rearranging formulae to change the subject. • Extending sequences • Calculating the nth term of a sequence • Using and interpreting the nth term of a sequence Multistep problems in a range of scenarios with reasoning, where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ >Algebra > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets Key & exemplar questions – WRM - SOL topics	Text Book Ch10, 15, 18 • Common misconception information Scientific calculators Manipulatives for visual balancing representations Equation Solver (mathsbot.com) Printed number lines for inequalities Year 9 Term 4 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment. Puzzles that you could use algebra to solve - Median Don Stewar Equations exercises from the 1950s (Resourceaholic) Solving linear equations - Cazoom Maths Sequences Search - Tristan Jones Sequences forwards and backwards - mathspad.co.uk	wherever possible to help students to engage and relate learning to everyday and working life. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com) **SMSC and BV** Demonstrate the use of patterns and sequences including the Fibonacci sequence and the Golden ratio within the wider world, including links to art, design and science. It is an opportunity to investigate another area of the history and discoveries within the subject at the end of term.

		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. The problems in the textbook should be used, as well as exam style questions. Further examples could include, but should not be limited to: Select an expression/equation/formula/identity from a list; Is 'x' a term of the sequence…? Writing and solving equations from written, contextual problems, including area and perimeter. Writing and solving inequalities from written, contextual problems.			Knowledge Recall Lesson – Unit 5 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch 5 Knowledge Quiz – Shared area		
Term 6							
	Topic 7: Ch6 – Angles (6 weeks)						
G1, G3, G4, G5, G6, G11	How do you calculate any angle and justify your answer? Yr7, Yr8 Ch7	6a. Angle properties in Geometry 6b. Angles in parallel lines 6c. Angles in polygons	Use letter notation for a line and angle; Recall the properties and definitions of special types of quadrilaterals, including symmetry properties; List the properties of each or identify a given shape; Given information on coordinate axes, complete the shape; Classify quadrilaterals by their geometric properties with correct terms; Understand and use the angle properties of quadrilaterals; Recall and use angles at a point, on a straight line, right angles, and vertically opposite angles; Distinguish between scalene, equilateral, isosceles and right-angled triangles; Derive and use the sum of angles in a triangle for missing angles; Use geometrical language appropriately and give reasons for angle calculations; Understand and use the angle properties of triangles, use the symmetry property of isosceles triangle to show that base angles are equal; Use the side/angle properties of isosceles and equilateral triangles; Show step-by-step deduction when solving problems; Understand and use the angle properties of intersecting lines; Understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices; Understand and use the angle properties of parallel lines.	rotational symmetry, vertices, edge, face, sides, triangle, perpendicular, isosceles, scalene, clockwise, anticlockwise, obtuse, acute, reflex, quadrilateral, triangle, regular, irregular, two-dimensional, three-dimensional, measure, line, angle, order, intersecting parallel, corresponding, alternate, co-interior, quadrilateral, angle, polygon, interior, exterior, proof, tessellation, hexagons, heptagons, octagons, decagons, See command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Finding missing angles on lines, around a point, in a triangle and in a quadrilateral. • Finding corresponding, alternate and co-interior angles. • Finding interior and exterior angles. • Algebraic angle problems • Repeated written reasoning and practice on using the correct formal notation. Multistep problems in a range of scenarios with reasoning, where necessary.	• Pearson's GCSE Maths F 9-1 Textbook: Ch6F . • Purposeful Practice Book Ch6F • Edexcel Higher Linear Course Text Book Ch2 • Common misconception information Scientific calculators Rulers and protractors for lower sets Year 9 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.	**Gatsby Benchmarks: Careers** Use real-life contexts once knowledge is secure to help students to engage and relate learning to everyday and working life. E.g. Engineering, architecture, design processes. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)

		6d. Angle problems with algebra	Find missing angles using corresponding and alternate angles Recognise and name pentagons, hexagons, heptagons, octagons and decagons; Understand 'regular' and 'irregular' as applied to polygons; Use the sum of angles of irregular polygons; Calculate and use the sums of the interior angles of polygons; Calculate and use the angles of regular polygons; Use the sum of the interior angles of an *n*-sided polygon; Use the sum of the exterior angles of any polygon is 360°; Use the sum of the interior angle and the exterior angle is 180°; Explain why some polygons fit together and others do not; Find the number of sides in a polygon, given information about the exterior and interior angles. Solve angle problems using equations. Solve geometric problems showing reasoning If time permits, it may be an opportunity to introduce Trigonometric ratios as an introduction to work covered in Ch12.		Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Let's draw some diagrams - Teachit Maths Flowers - Median Don Steward Quadrilaterals Always Sometimes Never - Lisa Bejarano Death Star Angles - dooranran on TES Key & exemplar questions – WRM - SOL topics	
	How do we calculate sides for right angled triangles?	6e. Pythagoras' Theorem	Understand, recall and use Pythagoras' Theorem in 2D, including leaving answers in surd form; Apply Pythagoras' Theorem with a triangle drawn on a coordinate grid; Given 3 sides of a triangle, justify if it is right-angled or not; Calculate the length of a line segment AB given pairs of points;	Hypotenuse, scalene, isosceles, equilateral, triangle, square	Starter quizzes for the term should include: Required prior knowledge Mixed skills practice Focused accuracy drills Knowledge gap support Look, cover, write, check. Pupils are expected to complete purposeful exercises and repeated practice on: • Pythagoras' Theorem Practical problems involving Pythagoras' Theorem Plenary style questions –	• Pearson's GCSE Maths F 9-1 Textbook: Ch12 • Purposeful Practice Book Ch12F • Edexcel Higher Linear Course Text Book Ch19 • Edexcel Foundation Linear Course Text Book Ch31 • Common misconception information Pythagoras visualisation	**SMSC & BV** Pythagroas' Theorem is an opportunity to discuss the cultural influence of mathematics on ancient societies and the varied contributions of other cultures to modern mathematics from an historical perspecitve. BBC - Historic Figures: Pythagoras Pythagoras (st-andrews.ac.uk)

					White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	- Pythagorean theorem water demo - YouTube Pythagorean stacks (equationfreak.blogspot.com) Pythagoras and surd form (Median Don Steward). How many ways can we write 1 million? - mathspad.co.uk Large and Small - Nuffield Foundation Year 9 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. The problems in the textbook should be used, as well as exam style questions. Further examples could include, but should not be limited to: Name all quadrilaterals that have a specific property. Use geometric reasoning to answer problems giving detailed reasons. Find the size of missing angles at a point or at a point on a straight line			Knowledge Recall Lesson – Unit 6 – Shared area. Pearson's KS3 Maths 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch6 Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							

Use of Big Questions and Lesson Questions

Please refer to the department document on using Big Questions as part of The Abbey Lesson – "What does an Abbey Lesson look like in Maths?".

Big Questions are designed to build upon pupils' prior knowledge and link topics across KS2, 3 and 4. Big Questions will connect a series of learning outcomes, as opposed to focussing on individual objectives. All students, regardless of ability will be exposed to the same knowledge within reason, but able to explore Mathematical concepts to varying depths and wider applications. The spectrum of the Big Question focus allows for this to happen. This is where Lesson Questions are used to tailor the approach, level of detail and depth of knowledge to suit the ability, attainment, and confidence of individual classes.

Common Misconceptions Notes

Ch1F

Students may write statements such as 150 – 210 = 60.
Significant figures and decimal place rounding are often confused.
Some students may think 35 877 = 36 to two significant figures.
The order of operations is often not applied correctly when squaring negative numbers and many calculators will reinforce this misconception.
10^3, for example, is interpreted as 10×3.

Ch2F

Any poor number skills involving negatives and times tables will become evident.
Incomplete expansion of brackets e.g. $3(x + 4) = 3x + 4$.
The convention of not writing a coefficient with a single value, i.e. x instead of $1x$, may cause confusion.
Some students may think that it is always true that $a = 1$, $b = 2$, $c = 3$.
If $a = 2$ sometimes students interpret $3a$ as 32.
Making mistakes with negatives, including the squaring of negative numbers.

Ch3F

Students struggle to make the link between what the data in a frequency table represents, so for example may state the 'frequency' rather than the interval when asked for the modal group.
Same size sectors for different sized data sets represent the same number rather than the same proportion.
Lines of best fit are often forgotten, but correct answers still obtained by sight.
Interpreting scales of different measurements and confusion between x and y axes when plotting points.

Ch7F

Often the $\sum(m \times f)$ is divided by the number of classes rather than $\sum f$ when estimating the mean.

Ch4F

The larger the denominator the larger the fraction.
Incorrect links between fractions and decimals, such as thinking that 1/5 = 0.15, 5% = 0.5, 4% = 0.4, etc.
It is not possible to have a percentage greater than 100%.
Student are set with the notion that It is not possible to have a percentage greater than 100%.

Ch5F

Rules of adding and subtracting negatives.

Inverse operations can be misapplied.
When solving inequalities, students often state their final answer as a number quantity and either exclude the inequality or change it to =.

Ch6F
Pupils may believe, incorrectly, that perpendicular lines have to be horizontal/vertical or all triangles have rotational symmetry of order 3.
Some students will think that all trapezia are isosceles, or a square is only square if 'horizontal' or a 'non-horizontal' square is called a diamond.
Incorrectly identifying the 'base angles' (i.e. the equal angles) of an isosceles triangle when not drawn horizontally.
Pupils may believe, incorrectly, that all polygons are regular.

GCSE – Command Words

Please note that this table is not exhaustive but uses the most commonly used command words. These should be highlighted, explained and demonstrated when giving out problem solving work and GCSE questions.

Command word	**Comments**
Write down... Write...	No working will be needed
Find...	Some working will be needed but will be minimal
Work out...	Used interchangeably with 'calculate', it will be necessary to do some working out
Calculate...	Used interchangeably with 'work out' but use of 'calculate' suggests that a calculator will be needed, it will be necessary to do some workings.
Explain...	Explanation needed – may be a sentence or could be a mathematical statement
Give a reason...	Clear reasons needed; if geometrical reasons then must link into working
Draw...	Implies accuracy is important
Sketch...	Less formal than 'draw'...(no accurate measurements needed)
Complete...	Usually means that some values need filling in, for example, on a probability tree diagram or a table of values
Show...	All working needed to get to the required answer must be shown
Prove...	More formal than 'show', all steps must be present and, in the case of a geometrical proof, reasons must be given
Prove algebraically...	Algebra must be used in the proof
Describe...	Words needed to describe, for example, a transformation
Justify...	Show all working or give a written explanation
Expand...	Remove brackets
Expand and simplify...	Remove brackets and simplify

Factorise...	Straight forward factorisation
Factorise fully...	More complex factorisation, more than one factor to consider
Simplify...	Simplify the given expression
Simplify fully....	Likely to be more than one stage needed to simplify expression
Solve...	Solve an equation / inequality

General Resources Bank

Teachers will select the resources required for individual lessons. These will be fit for purpose for their class in order to promote the best progress and understanding for individual objectives, whilst still working towards the Big Question.

A **sample** list of resource materials is given as a starting point or for new ideas and are used by the department:

- Pearson's Edexcel 9-1 Textbook Series 1 and 2 - ActiveLearn (pearsonactivelearn.com)
- Pearson's Purposeful Practice book - ActiveLearn (pearsonactivelearn.com)
- MathsBox - Mathsbox
  - A wide-ranging selection of mixed quizzes, repeated practice and differentiated questions for use in the classroom, including short term cover work.
- MathsBot - MathsBot.com - Tools for Maths Teachers
  - Interactive tools and activites to aid the teaching of mathematics. Hundreds of randomly generated questions and answers and Mathematics Manipulatives for mastery.
- Corbett maths Corbettmaths – Videos, worksheets, 5-a-day and much more
  - Video tutorials, questions, revision resources and puzzles.
- Maths 4 Everyone - Maths Worksheets [Primary and Secondary] (maths4everyone.com)
  - Carefully thought-out questions that are designed for the different stages of learning a topic. Typically, there is one sheet that focuses on the First Steps, and then other sheets that contain questions which help students to Strengthen and then Extend their understanding.
- Go Teach Maths - Go Teach Maths: 1000s of free resources
  - Animated PowerPoint slides to demonstrate a mathematical method within lessons and supporting activities with an individual or paired consolidation focus.
- Maths Genie – Maths Genie • Learn GCSE Maths for Free
  - GCSE revision videos, exam style questions and solutions.
- Oak Academy - Oak National Academy (thenational.academy)
  - Online lessons and resources to support independent study – particularly useful for students who are having to spend significant amounts of time outside of the classroom.
- Mr Barton – Variation Theory - Variation Theory

- A collection of high-quality, sequences of questions and examples using key principles from Variation Theory. Holds questions and examples constant, together with the mathematical behaviour of *reflect, expect, check, explain*.

- Dr Frost Maths - DrFrostMaths.com
  - A diverse set of free teaching resources and tools including downloadable teaching slides/worksheets for KS3-5, teaching videos and an online platform for whiteboard practice and exam questions.
- Edexcel Exam Wizard- ExamWizard :: Index
  - ExamWizard is a free exam preparation tool containing a bank of past Edexcel exam questions, mark schemes and examiners' reports for a range of GCSE subjects.

- Additional Maths Blogs and other online resources include:

  Solvemymaths
  Resouraholic
  Colleenyoung.wordpress
  missquinnmaths.wordpress
  Just Maths
  Mathed Up
  Miss B resources
  Boss Maths
  SavemyExams
  Nrich
  Pret Homework
  BBC Bitesize
  GCSE POD

Assessments/ Quizzes / Walking Talking Mocks / Pre-Public Examinations

Through the GCSE syllabus, pupils are assessed regularly to monitor progress, understanding and make predictions.

- **Formal Graded Assessments**

Formal assessments will occur once a term, during week 3 for monitoring purposes and formal feedback. It will be a mixed topic assessment to mimic the mixed topics they will need to answer for their end of year and public examinations. It is to support a more active attitude to revision in small, manageable tasks, as well as allowing students to revisit topics in a formal setting and identify gaps in knowledge.

- **Topic Quizzes**

Other assessment will be end of unit quizzes to assess recent learning and conducted when learning of that sequence is concluded.

For an improved response to revision and independent study, students are expected to undertake guided revision tasks through the year before assessments as part of their homework. Staff will support students with effective techniques and resources offered where required. These revision homework tasks will consist of:

- *Directions to important online videos and tasks to consolidate knowledge or expose students to a higher-level task or topic.*
- *Pre-prepared practice questions on the relevant topics, such as the Active Learn assessment materials and Hegarty Maths.*
- *GCSEPOD with videos and related questions.*

- **Walking, Talking Mocks**

Year 11 will have a Walking Talking Mock as a method of revisiting public exam formats and good exam technique. During the WTM, the teacher will model an approach to questions on an examination paper and guide students to complete it, with a large focus on areas that students struggle with and/or do not perform their best. Dates TBC following the publication of the exam schedule.

- **End of Year Assessments**

GCSE Public Examinations – dates to follow.

Consolidation and Review Activities

As part of each chapter of work, the students will need to undertake consolidation and review activities of their learning before moving on to new topics. This will be done as a Knowledge Recall activity.

This should consist of the following:

a. Revisiting the Big Questions, answered with new knowledge and connections reinforced. The focus here is on questioning of students and consolidation the sequences of lessons from the chapter.

b. Problem solving / literacy based questions with emphasis placed on highlighting key words and data, before undertaking problems as a sequence of steps. This is only if appropriate for the topic and required as additional work to lesson content.

c. Depending out the outcome of the Knowledge Recall, students can be directed on to either the strengthen exercise for any gaps in understanding or the extension activity work.

A topic quiz will then be set to assess understanding.

Starter activities should include topics identified in PIT from earlier assessments, as well as a constant revision of previous topics for assessment for learning.

Homework

Mathematics homework is designed and set to promote students' understanding and their ability to use mathematics in a variety of situations.

Homework should be set once per week and consist of:

- Online homework through Hegarty Maths *Trial beginning in September 2021.
- Preparation and Revision for assessments and quizzes, with particular reference to the Knowledge Organisers.
- Written homework when the teacher feels it is necessary or beneficial
- Past paper practice
- Research or Investigative Tasks.

It is expected that KS4 students will undertake a minimum of 45 minutes homework per week.

All students are given individual logins to a variety of virtual learning environments, which give them access to video tutorials, practice questions and answers. The main programmes being used are: Hegarty Maths, GCSE POD, Active Learn

For the majority of the time, homework will support in-class learning and reinforce topics that students have studied recently within the classroom.

If students fail to complete homework, staff will follow procedures outlined in the Behaviour Policy.

SMSC/ ICT/ Cross Curricular Connections

The programme of study is designed to encourage the development of wider problem solving as the mathematical knowledge of the student advances. Students must look for action points and next steps that are not explicit, in order to solve increasingly complex problems.

Lessons should :

- Value listening and respecting the viewpoint of others in problem solving.
- Promote the discussion of mathematical understanding and challenge assumption.
- Support students to question information and data that they are presented with.
- Discourage jumping to conclusions.
- Seek opportunities to build self-confidence.
- Include questions chosen based on prior lack of confidence,
- Encourage collaborative learning in the classroom – in the form of listening and learning from each other and paired discussion.
- Develop powers of logic, reasoning and explanation.
- Build competence – every student is good at something, and students struggle when connections between their strengths are not obvious or of a clear use.
- Allow choices to promote self-determination, and deal with the consequences, however minor. Giving authentic (not false) choices doesn't have to be complex—for example, choices around how to complete a multi-step problem.

Staff will seek out opportunities to encourage these values within individual lessons.

Staff should also seek out opportunities to link learning to other subjects as part of the ongoing cross -curricular cohesion project. This is ongoing but some existing links are referred to in this document as examples. By maintaining high standards of behaviour, including mutual respect and tolerance for different faiths and beliefs and encouraging learners to respect the protected characteristics, class teachers will be promoting British values. Specific examples relating to the British Values are detailed in certain chapters.