Maths	Autumn Term		Spring term		Summer term	
Year 7	1	2	3	4	5	6
Topic Summary	**Algebraic Thinking**	**Place value and proportion**	**Applications of Number**	**Directed Number & Fractional Thinking**	**Lines and Angles**	**Reasoning with number**
Thinking Hard	**Acquiring knowledge:** Algebra is an abstract concept so introducing this new skill set including all the notation is challenging from outset. Algebra is used extensively throughout the entire curriculum and so a good bedrock of knowledge needs to be developed.	**Not fearing failure:** Calculating in other bases - converting between numbers and binary using an entirely new counting system and performing calculations with this new system	**Development of literacy:** Interpretation of what the problems are and converting it from a worded problem into a numerical working and solution	**Creating independence:** Competence with multiple representations and being able to choose the best representation for each scenario	**Being Creative:** using angles and compasses to create their own geometric designs.	**Mastery of Learning:** Shows a greater depth of understanding to make conjectures
Developing Character	**Grit:** Systematic approach to tackling work/presenting work. Learning what is seen as the "scary" part of Secondary Mathematics	**Curiosity:** exploring different place values and it's uses in different civilisations as well as within computers	**Optimism:** Problem solving and improving accuracy	**Self Control:** Making real life connections with abstract concepts	**Mindfulness:** Accuracy of drawings, measuring etc. Promotes mindfulness exploring geometric art	**Self Assurance:** Proof and making conjectures. How can you prove this?
Understanding Diversity	**No limits to your destination:** rules of algebra, universal language and problem solving tool. BQ: Who invented algebra? Link to Muhamad ibn Musa al-Khwarizmi.	**Acquiring culture capital:** the invention of zero and development of different base systems. Big Question: What is zero in Roman numerals? (the lack of zero in counting systems pre-773AD.	**Being a world citizen:** Gelosia method/Napier's Bones and the Japanese line method for multiplication.	**Awareness of where you live:** naval references of sea level and temperature. Mary Rose. Our climate is temperate, however, in other parts of the world the "minus" temperatures can be more extreme. Big Question: What is the coldest country in the world? (Russia).	**Understanding mental and physical diversity:** Cultural applications of geometric art around the world. BQ: Why are there 360 degrees in a full turn? (Blame the Babylonians!)	**Understanding democracy:** Developing a theory and being able to prove your point?
Literacy Reading, Oracy	Reading 1 The Pattern Shortcut Reading 2: Palindromes and other pretty patterns	Reading 1 Bees are able to understand mathematics Reading 2: How many hairs are there on an adult humans head?	Reading 1: Animals that can do maths understand more than we think. Reading 2: Do more people go to football matches at the weekend than go to church (links to RSHE)	Reading 1: F1gur471v3ly 5p34k1ng (how your brain can read words made of numbers) Reading 2: Energy, climate and the environment	Reading 1 - How old is your dog? Reading 2: Why do science fiction writers like primes?	Reading 1: Inside the race to find the first billion-digit prime number Reading 2: Worried about shark attacks or terrorism
Gatsby, Careers	Concept of 'input/ operation/ output to every aspect of modern life (mobile phones)	Coding, programming. Importance of place value in careers - show video of Priti Patel (MP)	Credit and debit: working with money	Meteorologist	Engineering, design, art - how to become a aircraft engineer (bitesize)	Economist, financial advisor, - How to become a management accountant
Mental and Physical Well-being	Learning effective methods of problem-solving useful as a framework for solving real-life problems	Developing confidence in solving unfamiliar problems through a logical process	Logical thinking puzzles etc., keep the mind active		Enjoyment of art to promote mental well-being	Teaches systematic approach to problem solving in mathematics which can be transferred into interpersonal issues of wider life
Cross-Curricular Links	Introducing the use of calculators efficiently - Cross curricular multi subject including rearranging and substitution which are particular used in Science and Engineering. Inequalities used in Computing for logic commands **SMSC -** Social - Partner talk. Cultural - algebra as universal language.	Binary - the main computer language - is used regularly in Computer Science. Pie charts introduced looking at proportion which are used throughout Science, Geography and other subjects. **SMSC -** Cultural understanding Understanding the origins of place value	Development of techniques involving addition, subtraction, multiplication and division which are used through many different subjects. Fractions and percentages amounts can be used to help in Financial Education & Food Tech. **SMSC -** Understanding of methods of calculating throughout different cultures. Interesting discussions on religion come from reading 2.	**SMSC** - Focus on respecting classmates and classroom culture. Science and SMSC link to the environment from Reading 2.	Art introduces colour wheels and geometric tools. Links to Engineering by introducing compass work which can be used for detailed schematics involving curves. **SMSC** - Cultural - Looking at geometric art from across the world	Making a conclusive and structured argument. Need for evidence. Logical Thinking. Similar to paragraph structure in English as well as History. **SMSC** - Social Convince me of ..., why is that true. Focus on reasoning
Extra-Curricular Links	Coding, robotics	Gaming, coding	Cooking and baking, Model Making	Working out - counting reps and tracking weight loss/gain	Orienteering, navigation, woodworking, snooker/pool	Games of chance, chess
Precise Learning Endpoints Students will learn/ be able to:	1. Use and interpret algebraic notation. 2. Substitute into simple expressions. 3. Understand key vocabulary: term, expression, equation, coefficient, inequality and factor. 4. Know that a coefficient can be a fraction. 5. Simplify to maintain equivalence (collecting like terms). 6. Form and solve one step equations. 7. Model situations or procedures by translating them into an algebraic expression or formula and using graphs. 8. Generate terms of a sequence from either a term to term rule or position to term rule.	1. Understand and use place value for integers, decimals and measures. 2. Round to powers of 10 and 1sf. 3. Work interchangeably with terminating decimals and their equivalent fractions (e.g.: 3.5 and 7/2). 4. Define percentage as "number of parts per hundred". 5. Interpret percentage change as a fraction or a decimal. 6. Find the median and range from a set of data.	1. Use the four operations with integers and decimals. 2. Use conventional notation for the priority of operations. 3. Use a scientific calculator. 4. Change freely between related standard units. 5. Derive and apply formulae to calculate and solve problems involving: perimeter and area of rectangles, parallelograms and triangles. 6. Solve problems with line chart and bar graphs. 7. Find the mean from a set of data.	1. Order positive and negative integers. 2. Use a number line and inequality symbols. 3. Understand the concept and vocabulary of factors and multiples. 4. Use the four operations with directed number. 5. Add and subtract fractions and mixed numbers. *6. Form and solve two step equations.*	1. Draw and measure line segments and angles. 2. Describe, sketch and draw using conventional geometric terms and notations (including parallel and perpendicular lines). 3. Use the standard conventions for labelling the sides and angles of a triangle ABC. 4. Derive and illustrate properties of triangles and quadrilaterals using appropriate language and technologies. 5. Apply the properties of angles at a point, adjacent angles on a line and vertically opposite angles. 6. Construct and interpret pie charts.	1. Understand and use the concept of a prime number. 2. Be able to find HCF & LCM of two or more numbers. 3. Prime factorisation including product notation and the unique factorisation property. 4. Use integer powers and associated real roots. 5. Understand that the probabilities of all possible outcomes sum to one. 6. Use the probability scale. 7. Calculate simple probability.

Maths	Autumn Term		Spring term		Summer term	
Year 8	1	2	3	4	5	6
Topic Summary	**Proportional Reasoning**	**Representations**	**Algebraic Techniques**	**Developing Number**	**Developing Geometry**	**Reasoning with Data**
Thinking Hard	**Mastery of Learning**: Linking to real world situations i.e. baking in bulk, best buys, purchasing. Using recipes from around the world as examples when teaching proportional reasoning.	**Development of Literacy**: Development of new terminology and the etymology of the words. Development of Literacy new language and terminology : Use Maths in terms of everyday life, Example Squircle (name of the Instagram logo) Reuleaux triangle	**Not fearing failure**: Working in the abstract world and having confidence to do so . Confidence by solving problems:	**Acquiring knowledge:** looking at financial Maths and additional applications of number. Learning about compound interest and % Multipliers - Use Exponential Growth - Use a penny doubling every day for a Month. How long before you are a Millionaire ?	**Being creative:** Architects use geometry to study and divide space as well as draft detailed building plans. Builders and engineers rely on geometric principles to create structures safely.	**Creating Independence:** to be able to collect and analyse data through an independent statistical enquiry. When analyzing data, the goal is to turn information into insights and in order to create insights about the right things, we must ask the right questions. We use critical thinking to evaluate data.

Developing Character	**Kindness:** how and when could sharing amounts in a given ratio be more fair than sharing equally?	**Grit:** Developing a systematic approach to solving problems	**Self Assurance:** How creating an equation can help us solve problems systematically. Understanding how sequences follow patterns. Mathematics teaches students to be disciplined and obey the rules.	**Gratitude:** Being aware that we live in a developed country with financial stability	**Mindfulness:** Creating repeated patterns using reflection systematically - linking to interior and textile design.	**Curiosity:** Creating a statistical enquiry and becoming aware of how statistics can be manipulated.
Understanding Diversity	**Awareness of where you live:** Conversion graphs - different currencies. Exploring maps, (understanding of scale). Exploring maps, (understanding of scale). Using a map of Cowplain & relating distance & size to London.	**Understanding environmental diversity:** Looking at graphs and diagrams of different locations	**Being a world citizen:** introduction to some of the Greek alphabet	**No limits to your destination:** Financial systems across the world. Bank accounts, mortgages.	**Cultural Capital:** Explore uses of tessellation - Fashion, Interior design. Buildings (e.g. the Gherkin, Temple of Kandariya), Traditional African Fabrics	**Diversity, present and future** Comparative to another country
Literacy Reading, Oracy	Reading 1: What's the best way to cut a cake Reading 2: How can I get a meal ready on time ?	Reading 1: Why animals can recognise number, but only humans can do maths Reading 2: Without learning to think statistically, we'll never know when people are bending the truth	Reading 1: How much water is flushed down London toilets each day Reading 2: Something about nothing	Reading 1: How many tennis balls are used at Wimbledon Reading 2: Crime fighting maths	Reading 1: What is it about bees and hexagons? Reading 2. For these artists, Maths is their muse	Reading 1. How hard is it to scramble a Rubik's cube? Reading 2: England's crop circle controversy
Gatsby, Careers	Finance, construction, pharmaceuticals	Medicine, Statistician, Data analyst across numerous industries	Stem careers - lots of careers involve logical thinking and having to follow a process to get to a successful outcome	Business, Banking, Accountancy - founding a startup company (bitesize)	Fashion industry, Architecture, graphic design, Engineering, Architecture, Product Design	Data analyst, Big Data, Marketing (SEO), Business (financial/sales data), Actuary, Academia/Research, Research and Development, Scientific Research, Small Business Owner, Media, Politics, Civil Servant, Data Scientist, Project Manager
Mental and Physical Well-being	Calculations in relation to health diets	What is the probabilities of various illnesses?	Developing analytical processing skills	Building confidence in using numbers and learning about real-life financial scenarios : savings, loans, debt, bank accounts, mortgages	Construction/Assembly (flat packs) - creative	Better understanding of statistics given in news and advertising allowing for better informed decisions and less anxiety from understanding.
Cross-Curricular Links	Links to geography through maps and map reading, Food Tech when baking and altering recipes. Links to engineering with scale drawings. Will link to science looking at what affect the increase of one variable may have. **SMSC -** Moral sharing isn't always equal, looking at ratio in wills for inheritances. Link to colour wheel in art covered in Y7	Use Science & RSHE knowledge of healthy eating and human biology with maths skills to solve some problems:	Links to computing through using a sequence of steps to solve a problem. Lots of subjects may use and refer to 'unknowns' within the context of their topics.	Personal development, Financial Education & business studies **SMSC** Morality - tax, interest rates,	Art, Engineering **SMSC -** Cultural geometric art	Links to data analysis in Science as well as critical reasoning. **SMSC** Social looking at real life data
Extra-Curricular Links	Shopping, Baking, Modelling	Reading graphs. Healthy living	Solving puzzles, crosswords, logical problem solving	Part-time job, savings, shopping	Design	The ability to reason and understand data allows for a more well rounded worldly understanding
Precise Learning Endpoints Students will learn/ be able to:	1. Multiply and divide fractions. 2. Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs (e.g.: conversion graphs). 3. Use and interpret scale factors, scale diagrams and maps. 4. Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction. 5. Use ratio notation including reduction to simplest form. 6. Share in a given ratio. *7. Find the circumference of a circle (ratio of diameter to circumference).*	1.Work with coordinates in all four quadrants. 2. Recognise, sketch and produce graphs of linear functions. 3. Construct and use sample spaces to find probabilities of more than one event. 4. Enumerate sets and unions /intersections of sets systematically , using tables, grids and Venn diagrams. 5. Recognise different types of data and construct and interpret frequency tables (grouped and ungrouped) and two-way tables. 6. Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate this using scatter graphs.	1. Rearrange and simplify expressions. 2. Substitute values into more complex expressions involving indices. 3. Multiply a term over a single bracket. 4. Take out common factors from an algebraic expression. 5. Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors. 6. Recognise geometric sequences and appreciate other sequences that arise.	1. Write and compare numbers in standard form. Round 2. numbers to dp and sf. 3. Use standard units of time. 4. Use rounding to estimate and calculate resulting errors. 5. Calculate with money. 6. Express one quantity as a fraction of another. 7. Express one quantity as a percentage of another. 8. Compare two quantities using percentages. 9. Work with percentages greater than 100%.	1. Derive and apply formulae to calculate and solve problems involving: area of trapezium, circle and compound shapes. 2. Recognised and describe symmetry. 3. Identify properties of and describe the results of reflections applied to given figures. 4. Derive and illustrate properties of circles and other plane figures using appropriate language and technologies. 5.Understand and use the relationship between parallel lines and alternate and corresponding angles. 6. Derive and use the sum of angles in a triangle and use this to deduce the sum of angles in any polygon and to derive properties of regular polygons.	1. Collect data and construct and interpret multiple bar charts and line graphs. 2. Understand that graphical representations can be misleading. 3. Find the mode from a set of data. 4. Identify outliers and compare distributions using statistical measures.
Maths	**Autumn Term**		**Spring term**		**Summer term**	
Year 9	**1**	**2**	**3**	**4**	**5**	**6**
Topic Summary	**Reasoning with Algebra - Straight Line Graphs**	**Constructing in 2d & 3D**	**Reasoning with number**	**Reasoning with Geometry**	**Reasoning with Proportion**	**Representations**
Thinking Hard	**Creating independence** through the teaching of proof and conjectures. Following a systematic approach to problem solving by continually interleaving with real life examples and developing a creative and independent approach to thinking.	**Developing Literacy:** focusing on Mathematical names and properties of shapes. Acquiring knowledge by seeing the historical evolution of Shape names, formula, and Mathematicians (eg: Pythagoras). Building confidence by knowing when and how to apply formulae.	**Changing the world** having a solid understanding of financial numeracy and matters. Interleaving the relationship between world events and currency fluctuations. Understanding how numbers are applied to see the world and make decisions (e.g.: Climate Change, COVID).	**Being creative:** Enjoying the links between Pythagoras's Right Hand Triangles and building, seeing how Euclid's Golden Ratio is all around us in real life.	**Curiosity:** by understanding Inverse proportion students develop the knowledge to apply mathematical concepts to everyday life. E.g.: more workers on a job reduce the time to complete the task. Speed and time relationships.	**Mastery of learning**: Variety of ways to pictorially represent problems and Challenge Data not just accept
Developing Character	**Self-Assurance**: A systematic approach to solving equations, making and testing conjectures.	**Kindness:** Developing Spatial awareness.	**Optimism:** Developing financial awareness	**Mindfulness:** Creating patterns using rotations and translations and understanding congruence.	**Gratitude:** How proportion can be used to interpret the value of the things we can buy.	**Grit:** Representing data effectively so that statistical results can be easily interpreted.
Understanding Diversity	**Respecting human rights:** What is inequality?	**Diversity in thinking.** Comparing geometric thinking with algebraic thinking	**Acquiring cultural capital**: understanding the tax system	**Being a world citizen**: Did Pythagoras really discover the theorem?	**Awareness of where we live**: Currency Calculations and the impact of taxation on prices	**Understanding democracy**: Life chances depending on where in the world you live

Literacy Reading, Oracy	Reading 1. Conjecture Generator Reading 2. Why do clever people get things wrong	Reading 1. Stephen Hawking article about artificial intelligence Reading 2: How to make the world's roundest football	Reading 1: A complete guide to Maths in cybersecurity Reading 2. Why do we pay tax?	Reading 1. Is mathematics real? Reading 2. Why bother calculating pi to 86.8 trillion digits	Reading 1. Fantastic fractals Reading 2: If I drop a feather and a football, which hits the ground first?	Reading 1: Cows versus human - which emits the most methane? Reading 2: Statistical illiteracy isn't a niche problem. During a pandemic, it can be fatal. (highlights the importance of mathematical knowledge. (BQ why do we learn maths?))
Gatsby, Careers	STEM Opportunities emphasised. Logical way of working all careers	Animation , architecture, fashion design	Business Financial Education	Animation , architecture, fashion design - life as a director of a wholesaler fashion company (bitesize)	Travel international business. Science, chemistry, STEM opportunities	GATSBY - STEM Opportunities - formula one engineer (bitesize)
Mental and Physical Well-being	Learning effective methods of problem-solving useful as a framework for solving real-life problems	Teaches systematic approach to problem solving in mathematics which can be transferred into interpersonal issues	Logical way of working/thinking needed for all careers	Confidence in problem solving and construction	Understanding food/cosmetics and day to day processing	Deciphering visual representations - Business reports/statistical modelling etc.
Cross-Curricular Links	Science, Geography.	Engineering.	Standard Form in Science. **SMSC** Social and moral understanding how special deals can be used to manipulate spending habits . Why do we pay tax	Engineering. **SMSC -Cultural -** Understanding that the same properties apply to shapes across the world	Science. **SMSC** Understanding of proportion, the value of labour	Art - Computing - Visual representation.
Extra-Curricular Links	Gaming, Chess, processing	Design - theme parks	Data presentation - Modelling	Design - Fashion - Graphic	Cooking	Visual Presentation - Computing
Precise Learning Endpoints Students will learn/ be able to:	1. Rearranging and simplifying more complex expressions and equations (including changing the subject of a formula). 2. Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement). 3. Calculate and interpret gradients and intercepts of linear equations graphically, algebraically and numerically.	1. Derive and apply formulae to calculate and solve problems involving: surface area and volume of cuboids, cylinders and other prisms. 2. Draw and measure line segments and angles in geometric figures. 3. Derive and use standard ruler and compass constructions. 4. Use the properties of faces, surfaces, edges and vertices of 3D shapes to solve problems. 5. Interpret mathematical relationships geometrically and algebraically.	1. Appreciate the infinite nature of the sets of integers, real and rational numbers. 2. Calculate highest common factors and lowest common multiples using the prime factorisation method. 3. Use the four operations with fractions and mixed numbers. 4. Having an understanding of some financial mathematics, such as Best Buys, Interest, Bills & Bank statements. 5. Interpret fractions and percentages as operators. 6. Solve problems involving percentage change including increase, decrease and original amount.	1. Identify properties of and describe the results of translations and rotations applied to given figures. 2. Use Pythagoras' Theorem to solve problems involving right angled triangles. 3. Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides including Pythagoras' Theorem, and use known results to obtain simple proofs.	1. Solve problems involving direct and inverse proportion. 2. Use compound units such as speed, unit pricing and density to solve problems.	1. Expanding products of two or more binomials. 2. Change the subject of a formula. 3. Rearrange a linear equation to the form y = mx + c. 4. Find approximate solutions to contextual problems from given graphs of a variety of functions including piecewise linear, exponential and reciprocal equations. 5. Recognise, sketch and produce graphs of quadratic functions. 6. Use quadratic graphs to estimate values of y for given values of x and vice versa. 7. Recognise arithmetic sequences and find the nth term. 8. Compare experimental and theoretical probability. 9. Generate theoretical sample spaces for single and combined events and use these to calculate theoretical probabilities.

Maths	**Autumn Term**		**Spring term**		**Summer term**	
Year 10	**1**	**2**	**3**	**4**	**5**	**6**
Topic Summary	**Similarity**	**Developing Algebra**	**Geometry**	**Proportions and Proportional Change**	**Delving Into Data**	**Using Number**
Thinking Hard	Mastery of Learning: Trigonometry. Understanding the ergonomic ratios and link to similarity, deeper learning than just application.	Being creative: Simultaneous Equations. Using abstract thinking to solve real life problems.	Acquiring knowledge: Describing movement. Vectors working in abstract. Formulas to learn and remember	Development of literacy: Creating diagrams from worded questions to help find probabilities.	Changing the world: Understanding the influence of statistics in the real world	Creating Independence: Interleaved unit of all number from previous years. Literacy being tested, and high standards of oracy needed.
Developing Character	Grit: Developing Calculator skills for tough trigonometry topics.	Self-Control: Finding solutions to difficult multi-step problems using algebraic techniques.	Curiosity: Developing a deeper understanding of the world around us by exploring bearings, scale maps and vectors.	Gratitude: How ratio, proportion, and rates of interest impact our economic well-being.	Mindfulness: Building on previous skills by creating effective data collection, representation and interpretation.	Self Assurance: Working on and improving mental arithmetic skills with different types of numbers.
Understanding Diversity	**World citizen:** The laws of shapes are universal. Explore how different cultures have used these throughout history	**No limits to your destination:** Algebraic thinking, developing logical and analytical thought processes throughout the modern world	**Awareness of where you live:** Bearings and vectors. Orienteering and directions	**Understanding environmental diversity:** growth and decay problems	**Understanding democracy:** Understanding the influence and impact of data analysis on government, politics, media, and decision making	**Acquiring cultural capital:** abstract study of surds
Literacy Reading, Oracy	Reading 1: How is trigonometry used in Architecture? Reading 2: Why do cauliflowers look so odd?	Reading 1: paralympic games Reading 2: probably magic	Reading 1: Less is more: The quest for minimal surfaces Reading 2: How are circles used in real life?	Reading 1 - Celebrating a new pie record Reading 2 - Gauss the most brilliant mathematician of his time	Reading 1: luck and statistics Reading 2: football statistics	Reading 1: Ineligible to serve - Getting a job Reading 2: - is life unbounded?
Gatsby, Careers	Design, architecture (linked to reading 1), animation, games development. Employability skills - following a process to get a successful outcome. Inputting data into a calculator.	Logical thinking, building blocks for future careers	STEM - Aerospace, engineering	Financial Education /Business (% Change)	One of the fastest growing industries. Data Science, Social Media analytics, Business, Politics, Media, Government, Academic and Scientific Research	STEM - science/physics/engineering (bounds, accuracy etc.), Financial Analysis (sequences, indices)
Mental and Physical Well-being	Learning effective methods of problem-solving useful as a framework for solving real-life problems	Logical thinking puzzles etc., keep the mind active, promoting positive mental health	How environmental design can have an impact on our wellbeing. Ensuring we are surrounded by pleasing architecture.	Healthy eating, meal preparation etc.	Tracking health data, sleep analysis	Maths of nature
Cross-Curricular Links	Art, Graphics, Engineering. **SMSC** imaging a world without trigonometry what things in our every day culture would no longer exist?	Physics, Engineering.	Art, Engineering	Geography, Science, **SMSC** Morality probability and gambling	Geography, Psychology (central tendency), Business. **SMSC -** Social understanding how statistics can be manipulated	Numerical foundation for a majority of subjects. Reading 1: SMSC unfairness
Extra-Curricular Links	Illustration	Puzzles	Orienteering	Baking	News, current affairs, video game statistics, sports	Shopping, basic financial maths (non-calculator methods)

Precise Learning Endpoints Students will learn/ be able to:	1. Compare lengths, areas and volumes using ratio notation and/or scale factors; make links to similarity (including trigonometric ratios). 2. Interpret and use scale factors for enlargements. 3. Know and use the criteria for congruence of triangles. 4. Apply the concepts of similarity and congruence to solve problems. 5. Use Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right angled triangles. 6. Know the exact values for Sin, Cos and Tan for the required angles.	1. Factorising quadratics (including the difference of two squares). 2. Solve two simultaneous equations in two variables algebraically and find approximate solutions using a graph. 3. Solve linear inequalities and represent the solution on a number line. 4. Translate situations/procedures into an algebraic expressions or formulae, solve and interpret the solution.	1. Identify and apply circle definitions and properties. 2. Calculate arc lengths, angles and areas of sectors of circles. 3. Calculate surface area and volume of cylinders, cones (pyramids) and spheres. 4. Describe translations as 2D vectors. 5. Interpret and use bearings. 6. Apply addition and subtraction of vectors. 7. Complete multiplication of vectors by a scalar to both diagrammatic and column representations of vectors.	1. Identify and work with fractions in ratio problems. 2. Find and interpret simple and compound interest and repeated percentage change. 3. Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions. 4. Set up solve and interpret the answers in growth and decay problems including compound interest. 5. Calculate the probability of independent and dependent combined events including using tree diagrams and other representations. 6. Use a probability model to predict the outcome of future experiments. 7. Apply the property that the probability of an exhaustive set of mutually exclusive events sum to one.	1. Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling. 2. Construct and interpret tables and line graphs for time-series data. 3. Interpret, analyse and compare the distributions of data sets through appropriate graphical representation involving discrete, continuous and grouped data using appropriate measures of central tendency (including modal class) and spread. 4. Use and interpret scatter graphs: recognise correlation and know that it does not imply causation; draw lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing.	1. Apply and interpret limits of accuracy when rounding or truncating. 2. Calculate with numbers in standard index form. 3. Calculate with powers and roots and indices. 4. Work with exact answers (e.g.: in terms of pi). 5. Simplify expressions involving sums, products and powers including the laws of indices. Recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences and simple geometric progressions. 6. Add, subtract, multiply and divide algebraic fractions. Form and solve equations and inequalities with fractions.

Maths	Autumn Term		Spring term		Summer term	
Year 11	1	2	3	4	5	6
Topic Summary	**Graphs**	**Algebra**	**Reasoning**	**Revision and Communication**		
Thinking Hard	Development of literacy: Talking like a mathematician. Knowing and using the correct terminology	Not fearing failure: Quadratic Equations. Composite and Inverse Functions.	Mastery of learning: Revision of geometric, algebraic and numerical reasoning	Creating independence: Drawing all knowledge together.		
Developing Character	**Curiosity:** How graphs can represent real-life situations and how they can help to interpret future events.	**Optimism:** Having a deeper understanding of equations, formulae, inequalities and functions and how to manipulate them.	**Self-Assurance:** Using our knowledge of Number, Geometry and Algebra to conjecture, prove and reason.	**Grit:** Keep on going - nearly there!		
Understanding Diversity	**Acquiring cultural capital:** Real life graphs	**No limits to your destination:** working in the abstract	**Awareness of where you live:** Naval and Stem links promoted	**Becoming a word citizen:** Preparation for leaving Cowplain		
Literacy Reading, Oracy	Reading 1: Maths in a minute Reading 2: Graphs in everyday life	Reading 1: The golden ratio Reading 2: A universal equation for the shape of a perfect egg	Reading 1: Too big to write but not too big for Graham Reading 2: The Calculated shortcut	Reading 1: How clubs approach transfers Reading 2: The colourful mathematician who helped design the atomic bomb		
Gatsby, Careers	Statisticians (Office for National Statistics), Marketing and Sales	Engineering	Business management, Law, Government & Politics	You can be anything you set your mind to!		
Mental and Physical Well-being	Sleep analysis, Graphene health data.		Sometimes our emotions can rule our reasoning. Using our intelligence to understand our feeling and our reasoning to help us stay calm.	Understanding how physical well being can have a positive effect on mental well-being in order to be able to revise more effectively.		
Cross-Curricular Links	Also studied and applied in Science. Interleaving opportunities . Finding gradient of tangent in Science	Kinematics formulas already met and used in Science, interleaved opportunity. Also used in substitution earlier as random formulas	Certain units such as m/s used in Science. Science cover this spring year 10. Opportunities to discuss and link back to	STEM		
Precise Learning Endpoints Students will learn/ be able to:	1. Use the form y = mx + c to identify parallel lines. 2. Find the equation of a line through two given points, or through one point with a given gradient. 3. Recognise, plot and interpret graphs (linear, quadratic, cubic, reciprocal, real-life (e.g.: SDT), etc.). 4. Identify roots, intercepts and turning points of quadratic graphs graphically.	1. Interpret simple expressions as functions with inputs and outputs. 2. Substitute into kinematics formulae. 3. Simplify and manipulate algebraic equations including those involving surds. 4. Know the difference between an equation and an identity. 5. Form and solve quadratic equations (find and interpret roots).	1. Interpret the gradient of a straight line graph as a rate of change. 2. Construct, recognise and interpret graphs and equations that illustrate direct and inverse proportion. 3. Understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y. 4. Convert between related compound units (speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts. 5. Proving geometric facts. 6. Apply circle theorems (Angles between radius and chord, radius and tangent, 2 tangents from a point, alternate segment theorem) 7. Simplify complex expressions. 8. Use sequence rules 9. Solve complex simultaneous equations (quadratic/equation of a circle) 10. Formal algebraic proof. 11. Understand capture recapture	1. Apply systematic listing strategies. 2. Prove equivalence numerically. 3. Solve problems involving growth and decay (including compound interest). 4. Construct and interpret plans and elevations of 3D shapes. 5. Apply statistics to describe a population.		