Maths Curriculum Plan – Overview

Maths at Kingstone High School embeds key knowledge and skills by delivering content in small manageable steps, repeated application of the skills and knowledge over time, making connections between topics, and teaching for mastery. The intent is that this builds a comprehensive understanding for students’ future success in maths, so that no matter their ability each student can demonstrate confidence in their maths.

Small Steps: following an adapted White Rose Maths scheme of work the maths curriculum focuses teaching in small steps that form a path of progress within a block of learning. This ensures students are not overwhelmed and supports using a lower cognitive load focused on the key knowledge and skills in each lesson. These small steps are delivered in the form of a Key Question, and Path of Progress that maps the lesson’s learning into a short-term learning journey.

Application: knowledge and skills are applied to varying topics and in novel contexts throughout the course of a block. For example a student may learn the knowledge of what a ‘term’ or ‘expression’ is and looks like, they will then be asked to practice the skill of ‘collecting like terms’ or ‘form an expression’. This is in turn applied into worded, pictoral or geometric contexts such as ‘Write an expression for the perimeter of this shape’ or ‘Danny has *x* 5p coins and *y* 10p coins. Write an expression for the total amount *T* he has.’. This path is followed through each block starting with knowledge, using it in a skill, and applying it within a context. As students progress through school the focus is increasingly on fluency across a range of mathematical skills to be applied into different contexts.

Connections: the curriculum is based around building a confident mathematician that can spot connections between common mathematical structures, and not simply memorise methods. Blocks focus on the mathematical structure of a problem and the connected topics around it. This intent is to support students in method selection by teaching appropriate representations of the mathematical structure inherent in the topic. By using similar representations student will develop increasingly high-resolution schema of their maths by making connections and synthesis of knowledge of skills. For example in Year 8 students take knowledge of coordinates, function machines and expressions, the skills of substitution and plotting coordinates, and connect these previously separate areas of maths into ‘Plotting graphs in the form y = mx + c’.

Mastery: we use visuals and representations to aid students’ understanding, as a picture or model can often replace a lot of isolated methods or procedures. Through KS3, students will use manipulatives or draw out pictures of some of their problems to help embed the mathematical structure into their thinking. This is then built on at KS4 using pictoral prompts. Students will face both variety of questions and banks of questions to build fluency within a topic.

**Assessment Opportunities**

**Formative Assessment:**

Within the maths department we utilise many opportunities to check understanding of students through a block and throughout lessons. Use of *whiteboards* is commonplace as these allow immediate feedback, provide content for class discussion and help iron out misconceptions before they form into wrong thinking. *Starters* into lessons include recap and retrieval. For example *Flashback 4’s* make use of the ‘Last lesson, last week, last month, last year’ model of retrieval and recap. *Skills checks* focus on 10 skills to build up each half term. *Numeracy* starters help to build numerical calculation dexterity. *Questioning* and *class discussion* are vital elements for teachers of assessing students’ abilities and understanding. Students are expected to be able to talk about their maths.

**Summative Assessment:**

Students will undertake Key Assessments at three points during the year, one per term. The Key Assessment will assess on more than one topic and are designed to support a deeper understanding and embedding of key knowledge. In addition to the key assessments, students complete *block assessments* of key knowledge as well as a *termly assessments* covering the entirety of the term’s learning. Block assessments are mostly sat two at a time to encourage students to revise and increase the spacing for retrieval. This ultimately supports recall and preparation for undertaking the GCSE in Year 11. Block assessments are the same regardless of ability throughout Years 7-9, as this supports students to be Grade 5 Ready and continue their learning for KS4. End of Term assessments are divided into CORE or Foundation and Higher. This allows for students to still experience success whilst focusing on what are still key knowledge and skills to be retained.

In Year 10, block and end of term assessments divide into Higher and Foundation assessments, dependent on what is an aspirational best fit for the student to work towards. During Year 11 students move to taking regular short past papers to retrieve previous learning, alongside formative assessment in lesson to ensure learning of new content is still occurring.

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|  | **Term** | **Duration** | **Topic** | **Key Skills, Content or Knowledge** | **Summative Assessment** | **Blended Learning** | **SMSC Links & British Values** |
|  | Autumn 1 and Autumn 2 were complete following the White Rose scheme of learning. Following a change in the Spring term the curriculum was modified to follow the scheme of work shown below: | | | | | | |
| **Year 7** | **Spr. 1** |  |  |  |  |  |  |
| **6 wks** | **1 week** | **2D Shapes: Line and shape properties** | * Line properties * Shape properties * Symmetry | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Appreciation of mathematical patterns in nature and art.  **British Values:**  Individual Liberty: Encouraging creative thinking in problem-solving.  **Careers:**  Architecture, Graphic Design, Engineering  **Topic Misconceptions:**  All lines are straight and have the same properties; shapes with the same number of sides are always the same. |
|  | **1 week** | **Perimeter and Area: Perimeter** | * Finding perimeters from grids * Finding the perimeter of rectangles and simple shapes * Finding the perimeter of compound shapes | **Key Assessment 1.**  An assessment designed to interleave prior and current learning. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Understanding fairness in resource allocation (e.g., fencing a garden).  **British Values:**  Rule of Law: Following measurement rules for fairness.  **Careers:**  Construction, Surveying, Landscape Design  **Topic Misconceptions:**  The perimeter is the same as the area; only the sides of a shape contribute to the perimeter; perimeter is the area of a shape. |
|  | **2 weeks** | **Perimeter and Area: Area** | * Finding areas using grids * Finding the area of rectangles * Finding the area of compound shapes * Finding the area of triangles * Finding the area of compound shapes containing triangles | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Teamwork in measuring and calculating real-world spaces.  **British Values:**  Democracy: Valuing different methods and strategies in calculations.  **Careers:**  Architecture, Urban Planning, Interior Design  **Topic Misconceptions:**  Area is always the same for all shapes with the same perimeter; area is calculated the same way for every shape. |
|  | **1 week** | **Coordinates: Coordinates and shapes** | * Reading and plotting coordinates * Solving shape problems involving coordinates | Joint block test during week 3 – 40 minutes.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Working collaboratively on plotting and navigation tasks.  **British Values:**  Mutual Respect: Understanding different perspectives in positioning.  **Careers:**  Navigation, Geography, Game Design  **Topic Misconceptions:**  Coordinates only work for specific shapes; coordinates are only for large-scale maps and not useful for smaller shapes or regions. |
|  | **1 week** | **Factors, multiples and primes: Factors and multiples** | * Finding the lowest common multiple * Finding factors and using divisibility tests * Finding the highest common factor | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Developing accuracy and precision in numerical work  **British Values:**  Encouraging precision and careful calculation  **Careers:**  Engineering, Data Analysis, Accounting  **Topic Misconceptions:**  Factors are always smaller than the number; multiples can only be found by counting up in equal steps; factors cannot be larger than the number they are factors of. |
| **Spr. 2**  **7 wks** | **1 week** | **Factors, multiples and primes: Primes** | * Finding prime numbers * Prime factor decomposition |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual: Recognizing the beauty of mathematical patterns.  **British Values:**  Individual Liberty: Encouraging independent problem-solving.  **Careers:**  Computer Science, Data Analysis, Finance  **Topic Misconceptions:**  All numbers greater than 1 are prime; primes can be evenly divided by other numbers; a prime number can have more than two divisors. |
|  | **2 weeks** | **Fractions: Writing and comparing fractions** | * Finding fractions of shapes * Constructing fractions * Finding equivalent fractions * Simplifying fractions * Ordering fractions * Converting between mixed numbers and improper fractions | Joint block assessment during week 6 – 40 minutes.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Understanding historical contributions to prime number theory.  **British Values:**  Democracy: Valuing the contribution of different cultures to mathematics.  **Careers:**  Cryptography, Cybersecurity, Coding  **Topic Misconceptions:**  Fractions can only be compared by looking at the numerator; fractions with the same denominator are always the same size; larger fractions are always greater than smaller ones. |
|  | **2 weeks** | **Fractions: Adding and subtracting fractions** | * Adding and subtracting fractions * Adding and subtracting mixed numbers | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Understanding fair sharing and proportions in society.  **British Values:**  Mutual Respect: Appreciating different methods to solve problems.  **Careers:**  Business, Science, Economics  **Topic Misconceptions:**  Fractions can be added or subtracted directly without considering a common denominator; subtracting a larger fraction from a smaller one always results in a negative fraction. |
|  | **1 week** | **Brackets: Single brackets** | * Using the distributive law * Expanding single brackets * Expanding single brackets and simplifying expressions * Factorising into one bracket |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Working collaboratively on order of operations.  **British Values:**  Individual Liberty: Encouraging independent and logical thinking.  **Careers:**  Engineering, Coding, Accountancy  **Topic Misconceptions:**  Brackets are not necessary when performing calculations; you can ignore the order of operations if the calculation seems simple. |
| **Su. 1**  **4 wks** | **2 weeks** | **Y7 Sum 1: Constructing, measuring and using Geometric Notation** | * Use labelling conventions for shapes, lines and angles * Draw and measure line segments * Understand an angle is a measure of a turn and classify types of angle * Draw and measure angles up to 360' * Identify perpendicular and parallel lines * Recognise types of triangles and quadrilaterals * Identify polygons up to a decagon * Construct triangles using SSS, SAS and ASA * Construct more complex polygons * Interpret pie charts using proportion * Interpret pie charts accurately using a protractor * Draw pie charts | Joint block test during week 2 – 40 minutes  **Key Assessment 2.**  An assessment designed to interleave prior and current learning |  | **SMSC:**  Cultural: Recognizing the historical significance of geometric methods.  **British Values:**  Rule of Law: Following precise guidelines in mathematical construction.  **Careers:**  Architecture, Engineering, Design  **Topic Misconceptions:**  Geometric notation is not important if you understand the shapes; geometric constructions can be done without clear notation. |
|  | **2 weeks** | **Y7 Sum 2: Developing Geometric Reasoning** | * Understand and use sum of angles at a point * Understand and use sum of angles on a straight line * Understand and use the equality of vertically opposite angles * Know and apply the sum of angles in a triangle and quadrilateral * Solve angle problems using properties of triangles and quadrilaterals * Solve complex (multi-step) angle problems * Find and use the angle sum of any polygon (H) * Investigate angles in parallel lines (H) * Understand and use parallel line angles rules (H) * Use known facts to obtain simple proofs (H) | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual: Appreciating the structure and logic in the universe.  **British Values:**  Democracy: Encouraging reasoned arguments and proofs.  **Careers:**  Physics, Architecture, Engineering  **Topic Misconceptions:**  Geometric reasoning only applies to simple shapes; you don’t need to follow strict reasoning steps to solve geometric problems. |
| **Sum 2**  **7 wks** | **2 weeks** | **Y7 Sum 4: Sets & Probability** | * Identify and Represent Sets * Interpret and create Venn Diagrams * Understand the intersection and union of sets * Understand the complement of a set (H) * Know and use the vocabulary of probability * Generate samples spaces for single events * Calculate the probability of a single event * Understand and use the probability scale * Know that the sum of probabilities for all possible outcomes is 1 | Joint block test during last week of half-term.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Considering fairness in probability-based decisions.    **British Values:**  Rule of Law: Understanding chance and risk in decision-making.  **Careers:**  Statistics, Risk Analysis, Insurance  **Topic Misconceptions:**  Probability always predicts exact outcomes; sets are only for whole numbers or integers; events in probability are always equally likely. |
|  | **2 weeks** | **Y7 Sum 5: Prime Numbers & Proof** | * Find and use multiples * Identify factors of numbers and expressions * Recognise and identify prime numbers * Recognise square and triangular numbers * Find common factors and the HCF * Find common multiples and the LCM * Write a number as a product of prime factors * Use a Venn diagram to find HCF and LCM * Make and test conjectures * Use counterexample to disprove a conjecture | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Recognizing contributions of different cultures to prime number theory.  **British Values:**  Individual Liberty: Encouraging deep, independent thinking in proofs.  **Careers:**  Cybersecurity, Mathematics Research, Data Science  **Topic Misconceptions:**  Every number greater than 1 is prime; prime numbers can be divided by other numbers; all prime numbers are odd. |
| **Sum 2** | **3 weeks** | **Assessment and Drop Down** |  |  |  |  |

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| **Year 8** | **Aut. 1**  **8 wks** | **3 weeks** | **Working in the Cartesian Plan** | * Work with coordinates in all four quadrants * Identify and draw lines parallel to axes (x = a, y = b) * Recognise and use the line y = x * Recognise and use lines of the form y = kx * Link y = kx to direct proportion problems * Explore the gradient of the line * Recognise y = x + a * Explore negative gradients inc. x + y = a * Link graphs and sequences * Plot graphs of y = mx+c * Explore non-linear graphs * Find the midpoint of a line segment | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Collaboration in coordinate geometry problems. Moral: Ethical use of graphs in real-world applications.  **British Values:**  Rule of Law: Graphs provide structure and fairness in problem-solving. Democracy: Visual representation of data for decision-making.  **Careers:**  Engineer, Architect, Data Analyst, Urban Planner  **Topic Misconceptions:**  Coordinates are always positive; the origin is the top-left corner; all quadrants are the same size. |
|  | **2 weeks** | **Ratio and Scale** | * Understand meaning and representation of ratio * Use ratio notation * Solve problems starting with 1:n * Solve problems with ratio in the form m:n * Divide in a given ratio * Express ratios in their simplest integer form * Express ratios in the form 1:n * Compare ratios and fractions * Understand pi as a ratio * Understand gradient as a ratio | Joint block test end - 40 mins. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Understanding scale in maps and architecture. Moral: Fair proportioning in sharing and resources. .  **British Values:**  Democracy: Fair distribution and scaling in economics. Rule of Law: Consistency in measurements and scaling  **Careers:**  Architect, Graphic Designer, Cartographer, Economist  **Topic Misconceptions:**  Ratios are only used with whole numbers; scale always means enlargement or reduction; ratios can be used for non-proportional quantities. |
|  | **2 weeks** | **Multiplicative Change** | * Solve direct proportion problems * Explore conversion graphs * Convert between currencies * Explore direct proportion in graphs * Explore relationships between similar shapes * Understand scale factors as multiplicative representations * Draw and inter[ret scale diagrams * Interpret maps using scale factors and ratios | **Key Assessment 1.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual: Growth patterns in nature (e.g., exponential growth). Social: Impact of inflation and pricing  **British Values:**  Individual Liberty: Understanding economic growth and personal finance. Democracy: Inflation and wage growth patterns.  **Careers:**  Financial Analyst, Economist, Pharmacist, Biologist  **Topic Misconceptions:**  Multiplicative change always results in a larger number; multiplication and division are interchangeable in change. |
|  | **1 week** | **Representing Data** | * Draw and interpret scatter graphs * Understand and describe linear correlation * Draw and use line of best fit * Identify non-linear relationships * Identify different types of data * Read and interpret ungrouped frequency tables * Read and interpret grouped frequency tables * Represent grouped discrete data * Represent continuous data grouped into equal classes * Construct and interpret two-way tables | End of term assessment (penultimate week of term) | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Ethical data representation. Cultural: Use of data in different societies and economies.  **British Values:**  Rule of Law: Ethical data representation. Mutual Respect: Understanding cultural differences in data analysis.  **Careers:**  Statistician, Market Analyst, Data Scientist, Journalist  **Topic Misconceptions:**  Data can only be represented in one way (e.g., only using bar charts); data representation is the same for all types of data. |
| **Au.2**  **6 wks** | **1 week** | **Representing Data** | Continued for Autumn 2. |  |  |  |
|  | **2 weeks** | **Tables and Probability** | * Construct sample spaces for one or more events * Find probabilities from a sample space * Find probabilities from two-way tables * Find probabilities from Venn Diagrams * use the product rule for finding total number of possible outcomes | Joint block test - 40 mins.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Fairness in probability (e.g., gambling awareness). Social: Decision-making based on probability.  **British Values:**  Moral: Probability in fair decision-making (e.g., lotteries). Democracy: Understanding chance in elections and policies.  **Careers:**  Actuary, Risk Analyst, Insurance Underwriter, Data Scientist  **Topic Misconceptions:**  Probabilities in tables must always add up to 1; probability tables are only useful for discrete events. |
|  | **2 weeks** | **Multiplying and Dividing Fractions** | * Represent multiplication of fractions * Multiply a fraction by an integer * Find the product of a pair of unit fractions * Find the product of a pair of any fractions * Divide an integer by a fraction * Divide a fraction by a unit fraction * Understand and use the reciprocal * Divide any pair of fractions * Multiply and divide improper and mixed fractions * Multiply and divide algebraic fractions |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Fair division and sharing. Social: Group activities involving fractions.  **British Values:**  Mutual Respect: Fair distribution of resources. Rule of Law: Accuracy in mathematical division.  **Careers:**  Baker, Chef, Engineer, Financial Advisor  **Topic Misconceptions:**  You add the numerators and denominators when multiplying fractions; dividing fractions is the same as multiplying by the reciprocal. |
| **Spr. 1**  **6 wks** | **1 week** | **Brackets** | * Understand expansion of a bracket is a multiplicative operation * expand a number over a single bracket * expand a variable over a single bracket * expand a term over a single bracket and simplify powers * expand two linear expressions and simplify | Short assessment of a large range of skills and applications of brackets. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Logical thinking in structured problem-solving. Moral: Importance of following mathematical rules.  **British Values:**  Rule of Law: Following algebraic rules to maintain consistency. Democracy: Logical problem-solving.  **Careers:**  Computer Programmer, Engineer, Mathematician, Accountant  **Topic Misconceptions:**  Brackets only apply to expressions with numbers; brackets don’t affect the order of operations when simplifying. |
|  | **3 weeks** | **Equations** | * Understanding the equals sign means both sides are the same * Understand the value of ‘x’ is known as a ‘solution’ * Solve one step equations including solutions as fractions * Solve two step equations * Solve equations with brackets | Short assessment of a large range of skills and applications of solving equations.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual: Finding patterns and relationships in the universe. Social: Collaboration in solving equations.  **British Values:**  Individual Liberty: Problem-solving autonomy. Rule of Law: Structured approach to equations.  **Careers:**  Engineer, Computer Scientist, Financial Analyst, Mathematician  **Topic Misconceptions:**  Equations always have one solution; equations with variables on both sides can't be solved. |
|  | **2 weeks** | **Fractions and Percentages** | * Convert fluently between key fractions, decimals and percentages * Calculate key fractions, decimals and percentages of an amount without a calculator * Calculate fractions, decimals and percentages of an amount using calculator methods * Convert between decimals and percentages greater than 100% * Percentage decrease with a multiplier * Calculate percentage increase and decrease using a multiplier * Express one number as a fraction or a percentage of another without a calculator * Express one number as a fraction or a percentage of another using calculator methods * Work with percentage change * Choose appropriate methods to solve percentage problems * Find the original amount given the percentage less than 100% * Find the original amount given the percentage greater than 100% * Choose appropriate methods to solve complex percentage problems |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Fair taxation and financial ethics. Social: Budgeting and personal finance.  **British Values:**  Moral: Ethical financial decisions. Individual Liberty: Personal financial management.  **Careers:**  Financial Advisor, Tax Consultant, Business Analyst, Economist  **Topic Misconceptions:**  Fractions and percentages are the same thing; converting fractions to percentages always involves multiplying by 100. |
| **Sp.2**  **7 wks** | **1 week** | **Sequences** | * Generate sequences given a rule in words * Generate sequences given a simple algebraic rule * Generate sequences given a complex algebraic rule * Find the rule for the nth term in a linear sequence | Joint block test with Indices after teaching both units.  End of term assessment (penultimate week of term) | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual: Fibonacci sequence in nature. Cultural: Historical mathematical developments.  **British Values:**  Mutual Respect: Historical contributions to sequences. Democracy: Predicting trends in elections and finance.  **Careers:**  Data Analyst, Mathematician, Cryptographer, Biologist  **Topic Misconceptions:**  Sequences always increase; there is no difference between a sequence and a series. |
|  | **1 week** | **Indices** | * Adding and subtracting expressions with indices * Simplifying algebraic expressions by multiplying indices * Simplifying algebraic expressions by dividing indices * Using the addition law for indices * Using the addition and subtraction law for indices * Exploring powers of powers | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual: Exploring patterns in the universe. Cultural: Contributions of various mathematicians.  **British Values:**  Rule of Law: Consistent mathematical rules. Individual Liberty: Exploration of mathematical patterns.  **Careers:**  Physicist, Astronomer, Engineer, Data Scientist  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | Indices always make numbers bigger; you can add indices when multiplying numbers with different bases. | |
|  | **1 week** | **Inequalities** | * Understand use of the four inequality symbols and use with place value questions * Find integer solutions to simple inequalities * Solve one and two-step inequalities * Solve inequalities with unknowns on both sides | Short assessment of a large range of skills and applications of inequalities.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Ethical use of inequalities in real life (e.g., wage gaps).  **British Values:**  Democracy: Fair use of inequalities in wage calculations.  **Careers:**  Lawyer, Financial Analyst, Data Scientist, Economist  **Topic Misconceptions:**  Inequalities can only be true or false; inequalities behave the same as equations. |
|  | **1 week** | **Forming and Solving Equations** | * Understand difference between an expression, equation and a formula. * Form simple expressions and equations from pictoral representations or worded problems. * Form and solve multi-step equations including unknowns on both sides from worded problems and geometric problems. * Form and solve equations from geometric problems including area and perimeter. | Short assessment of a large range of skills and applications of forming and solving equations.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Problem-solving in groups.  **British Values:**  Rule of Law: Ensuring fair outcomes.  **Careers:**  Lawyer, Financial Analyst, Data Scientist, Economist  **Topic Misconceptions:**  Every equation has only one solution; you can solve any equation by just isolating one variable. |
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| **Spr. 2** |  |  |  |  |  |
|  | **1 week** | **Standard Index Form** | * Investigate positive powers of 10 * Work with numbers greater than 1 in standard form * Investigate negative powers of 10 * Work with numbers between 0 and 1 in standard form * Compare and order numbers in standard form * Mentally calculate with numbers in standard form * Add and subtract numbers in standard form * Multiply and divide numbers in standard form * Use a calculator to work with numbers in standard form * Understand and use negative indices * Understand and use fractional indices | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Scientific applications of indices. Social: Technological advancements using indices.  **British Values:**  Rule of Law: Standardization in scientific calculations. Democracy: Equal access to knowledge.  **Careers:**  Scientist, Engineer, Computer Scientist, Astronomer  **Topic Misconceptions:**  Standard index form is only for very large or very small numbers; you can convert any number to standard index form without considering its magnitude. |
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| **Su. 1** | **2 weeks** | **Angles in Parallel Lines and Polygons** | * Understand and use basic angles rules and notation * Investigate angles between parallel lines and the transversal * Identify and calculate with alternate and corresponding angles * Identify and calculate with cointerior angles * Solve complex problems with parallel lines and angles * Construction of triangle and special quadrilaterals * Investigate the properties of special quadrilaterals * Identify and calculate with sides and angles in special quadrilaterals * Understand and use sum of exterior and interior angles of any polygon * Calculate missing interior angles of regular polygons * Prove simple geometric facts * Construct angle and perpendicular bisectors | Joint block test with Area of Trapezia and Circles after teaching next unit.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Angles in architecture across different cultures. Moral: Accuracy in design and construction.  **British Values:**  Cultural Respect: Angles in historical architecture. Rule of Law: Consistent mathematical principles.  **Careers:**  Architect, Engineer, Surveyor, Designer  **Topic Misconceptions:**  All angles in parallel lines are supplementary; all interior angles in polygons add up to 180°. |
|  | **2 weeks** | **Area of Trapezia and Circles** | * Calculate area of triangles, rectangles and parallelograms * Calculate area of a trapezium * Calculate perimeter and area of compound shapes * Investigate area of a circle * Calculate area of a circle and parts of a circle with and without a calculator * Calculate the perimeter and area of compound shapes inc. circles | Joint block test with Angles in Parallel Lines and Polygons  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Historical significance of circle calculations. Social: Engineering and design applications.  **British Values:**  Cultural Respect: History of geometric calculations. Democracy: Fair distribution in design.  **Careers:**  Architect, Engineer, Mathematician, Product Designer  **Topic Misconceptions:**  The area of a trapezium is the same as the area of a rectangle; the formula for the area of a circle involves multiplying the radius twice. |
| **Su.2** | **1 week** | **Lines of Symmetry and Reflection** | * Recognise line symmetry * Reflect a shape in a horizontal or vertical touching the shape * Reflect a shape in a diagonal line | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural: Symmetry in global architecture and art. Spiritual: Beauty of mathematical symmetry in nature.  **British Values:**  Mutual Respect: Cultural appreciation of symmetry. Individual Liberty: Artistic expression through symmetry.  **Careers:**  Graphic Designer, Architect, Biologist, Mathematician  **Topic Misconceptions:**  All shapes have only one line of symmetry; reflection means just flipping the shape in any direction. |
| **Su.2** | **2 weeks** | **Measures of Location** | * Understand and use the mean, median andmode * Choose most appropriate average * Find the mean from an ungrouped freuqnecy table (H) * Find mean from grouped frequency table (H) * Identify Outliers * Compare distributions using averages and the range | Block test – 20 minutes  **Key Assessment 3.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social: Use of statistics in decision-making. Moral: Ethical use of averages and data interpretation.  **British Values:**  Democracy: Use of statistics in government. Rule of Law: Accuracy in reporting data.  **Careers:**  Statistician, Data Scientist, Market Researcher, Psychologist  **Topic Misconceptions:**  Measures of location (mean, median, mode) are always the same; the mean is always the best measure of central tendency. |
|  |  | **2 weeks** | **Data Handling Cycle** | * Set up a statistical enquiry * Design and criticise questionnaires * Draw and interpret pictograms, bar charts and vertical line charts * Draw and interpret multiple bar charts * Draw and interpret pie charts * Draw and interpret line graphs * Choose most appropriate diagram for given set of data * Represent and interpret grouped quantitative data * Find and interpret the range * Compare distribution using charts * Identify misleading graphs | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral: Responsible data collection. Social: Impact of statistical findings on society.  **British Values:**  Rule of Law: Ethical data collection and analysis. Democracy: Impact of data on policy-making.  **Careers:**  Statistician, Economist, Data Analyst, Research Scientist  **Topic Misconceptions:**  Data handling always involves collecting, processing, and presenting data in a linear order; data handling cycle doesn't need review or adjustments. |

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|  | **Term** | **Duration** | **Topic** | **Key Skills, Content or Knowledge** | **Summative Assessment** | **Blended Learning** | **SMSC Links & British Values** |
| **Year 9** | **Au.1** | **1 weeks** | **Introduction** | * Recap: Four operations and algebra. |  |  |  |
| **8 wks** | **2 weeks** | **Forming and Solving Equations** | * One and two step equations and inequalities * Equations and inequalities with brackets * Using negative numbers in inequalities * Solve equations with unknowns on both sides * Solve inequalities with unknowns on both sides * Equations in mathematical contexts (perimeter, area etc) * Formulae and equations using substitution * Rearrange formulae (one-step) * Rearrange formulae (two-step) * Rearrange complex formulae (H) | Joint block test with straight line graphs around week 4-5.  **Key Assessment 1.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Logical reasoning, problem-solving skills  **British Values:**  Encourages rule-following and logical structuring  **Careers:**  Engineering, Programming, Data Science  **Topic Misconceptions:**  Equations can only have one solution; only linear equations exist; you can ignore signs when solving equations. |
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|  | **2 weeks** | **Testing Conjectures** | * Factors, multiples, primes (r) * True/False * Conjectures about number * Expand a pair of binomials * Conjectures about algebra * Explore the 100 grid (forming patterns) * Expand three binomials (H) | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Encouraging critical thinking and evaluation  **British Values:**  Challenging ideas and forming reasoned arguments  **Careers:**  Research, Law, Scientific Analysis  **Topic Misconceptions:**  A conjecture must always be true in all cases; testing conjectures is unnecessary if the answer seems reasonable. |
|  | **2 weeks** | **Straight Line Graphs** | * Use a table of values (R) * Compare gradients and intercepts * Understand and use y = mx+c * Write equations in the form y = mx+c * Find equation of a line from a graph * Interpret gradient and intercept in real-life graphs * Model real-life graphs involving inverse proportion * Explore perpendicular lines |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Real-world applications in geography and physics  **British Values:**  Developing fair analytical skills  **Careers:**  Architecture, Cartography, Physics  **Topic Misconceptions:**  The slope of a line is always positive; the equation of a straight line is always y = mx + b; lines cannot be vertical. |
| **Aut. 2** | **1 week** | **Three-dimensional Shapes** | * Know names of 2d and 3d shapes (R) * Recognise prisms, edges, vertices, faces etc (R) * Draw accurate nets of cuboids and other 3D shapes * Recognise nets of prisms * Plans and elevations * Find area of 2d shapes (R) * Surface area of cubes/cuboids/ triangular prisms * Surface area of cylinders * Volume of cubes and cuboids * Volume of prisms * Volume of spheres, pyramids, cones (H) | Block test – 20 minutes.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Understanding geometry in nature and architecture  **British Values:**  Respect for cultural contributions in architecture  **Careers:**  Architecture, 3D Modelling, Design  **Topic Misconceptions:**  All 3D shapes have the same properties; only cubes are 3D shapes; volume and surface area are the same. |
| **Au.2** | **2 weeks** | **Three-dimensional Shapes** | * Continued for Au.1 |  |  |  |
| **6 wks** | **3 weeks** | **Constructions and Congruency** | * Draw and measure angles (R) * Construct and interpret scale drawings (R) * Locus from a point * Locus from two points * Construct perpendicular bisector * Construct perpendicular from a point * Locus from two lines * Construct angle bisector * Construct triangles * Identify congruent shapes * Identify and explore congruent triangles | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Developing precision and accuracy  **British Values:**  Precision and following logical steps  **Careers:**  Engineering, Technical Drawing, Surveying  **Topic Misconceptions:**  All constructions need to be perfect, and any minor error ruins the figure; congruent shapes must be exactly the same. |
|  | **1 week** | **Assessment/ Review** |  |  |  |  |
| **Sp.1**  **6 wks** | **3 weeks** | **Percentages** | * Use the equivalence of fractions, decimals and percentages * Calculate percentage increase and decrease * Express a change as a percentage * Solve 'reverse' percentage problems * Recognise and solve percentage problems (NC) * Recognise and solve percentage problems (C)   Solve problems with repeated percentage change | Joint block test with Number around week 4-5. 40 minutes.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Financial literacy and responsible spending  **British Values:**  Responsible financial decision-making  **Careers:**  Finance, Business, Economics  **Topic Misconceptions:**   |  | | --- | |  |   Percentages always refer to the whole; converting a percentage to a decimal is always a simple division by 100. |
|  | **2 weeks** | **Numbers** | * Integer, real and rational numbers * Understand and use surds * Work with directed number * Solve problems with integers * Solve problems with decimals * HCF and LCM * Adding and subtracting fractions * Multiplying and dividing fractions * Solving problems with fractions * Numbers in standard form | Joint block test with percentages around week 4-5. 40 minutes.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Exploring the universality of numbers  **British Values:**  Respect for mathematical heritage across cultures  **Careers:**  Finance, Data Science, Cryptography  **Topic Misconceptions:**  All numbers are positive; fractions are less than whole numbers; negative numbers don't have real-world applications. |
|  | **1 week** | **Banking and Finances** | * Solve problems with bills and bank statements * Calculate simple interest * Calculate compound interest * Solve problems with VAT * Calculate wages and taxes * Solve problems with exchange rates * Solve unit pricing problems | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Economic understanding and planning  **British Values:**  Ethical considerations in finance and banking  **Careers:**  Banking, Investment, Accounting  **Topic Misconceptions:**  The interest on a loan is always calculated the same way; monthly payments are always the same amount for different loans. |
| **Spr. 2** | **2 weeks** | **Pythagoras Theorem** | * Squares and square roots * Identify the hypotenuse of a right-angled triangle * Determine whether a triangle is right-angled * Calculate the hypotenuse of a right-angled triangle * Use Pythagoras Theorem on coordinate axes * Explore proofs of Pythagoras' Theorem * Use Pythagoras Theorem in 3D-shapes |  |  |  |
| **7 wks** |  | **Pythagoras Theorem** | Block test. 20 minutes.  **Key Assessment 2.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Historical significance in architecture and navigation  **British Values:**  Respect for ancient mathematical discoveries  **Careers:**  Architecture, Engineering, Physics  **Topic Misconceptions:**  The Pythagorean theorem only works for right-angled triangles with whole-number sides; it is only applicable in 2D shapes. |
|  | **2 weeks** | **Deduction** | * Angles in parallel lines * Solving angles problems (using chains of reasoning) * Angles problems with algebra * Conjectures with angles * Conjectures with shapes * Link constructions and geometrical reasoning | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Using logic and reasoning in mathematics  **British Values:**  Promoting structured thinking and reasoning  **Careers:**  Mathematical Research, Logic in AI  **Topic Misconceptions:**  Deductive reasoning can only be applied to math problems, not real-world scenarios; conclusions from deduction are always true. |
|  | **2 weeks** | **Rotation and Translation** |  |  |  | **SMSC:**  Cultural: Appreciating the historical and global contributions of different cultures to geometric transformations, such as Islamic art and architecture.  **British Values:**  Individual Liberty: Encouraging independent exploration of transformations through creative problem-solving.  **Careers:**   |  | | --- | |  |  |  |  |  | | --- | --- | --- | | Architecture, Engineering, Computer Graphics, Game Design, Robotics, Animation, CAD (Computer-Aided Design).  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | Rotations can only be made by 90 degrees; translations only happen along horizontal or vertical lines. | | |

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|  | **Su.1**  **4 wks** | **2 weeks** | **Probability** | * Single event probability (R) * Relative frequency - including convergence * Expected Outcomes * Independent Events * Use Tree Diagrams (H) * Use Tree Diagrams without replacement (H) * Use Diagrams to work out Probabilities | Joint block test with statistics recap - 40 minutes  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Understanding risk and uncertainty in decision-making  **British Values:**  Understanding fairness in probability scenarios  **Careers:**  Statistics, Actuarial Science, Gaming Industry  **Topic Misconceptions:**  Probability always adds up to 1 for every event; if something hasn't happened yet, it's impossible for it to occur. |
|  | **1 week** | **Statistics recap** | * Mode, Median, Range (R) * Choosing Appropriate average given the data * Mean from tables * Missing mean problems * Interpreting Charts and Graphs | Joint block test with statistics recap - 40 minutes  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Interpreting real-world data and trends  **British Values:**  Making informed decisions based on statistics  **Careers:**  Market Research, Data Analytics  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | The mean is always the best measure of central tendency; the range provides enough information to describe a set of data. | |
|  | **1 weeks** | **Ratio and proportion** | * Solve problems with direct proportion (R) * Direct proportion and conversion graphs * Solve problems with inverse proportion * Graphs of inverse relationships (H) * Solve ratio problems given whole or part or difference * Solve best buy problems * Solve problems involving ratio and algebra (H) | Joint block test with statistics recap - 40 minutes  End of term assessment |  | **SMSC:**  Proportional reasoning in everyday life  **British Values:**  Equality and fairness in ratios and sharing  **Careers:**  Cooking, Fashion Design, Engineering  **Topic Misconceptions:**  Ratios always involve whole numbers; you must always find the lowest common denominator; proportion problems always involve two numbers. |
| **Su.2**  **7 wks** | **1 week** | **Ratio and proportion** | * Continued for Su.1 |  |  |  |
|  |  |  | * SDT problems without a calculator (fractions) * SDT problems with a calculator * Use distance-time graphs * DMV problems * Rates of flow problems * Rates of change and units * Convert compound units | Joint block test with statistics recap - 40 minutes  **Key Assessment 3.**  An assessment designed to interleave prior and current learning |  |  |
|  | **1 week** | **Rates** | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Understanding real-world speed and flow rates  **British Values:**  Understanding efficiency and productivity  **Careers:**  Logistics, Supply Chain Management  **Topic Misconceptions:**  Rates are the same as simple percentages; the term "rate" only refers to time-related problems. |
|  | **2 weeks** | **Enlargement and Similarity** | * Recognise enlargement and similarity * Enlarge a shape by a positive SF * Enlarge a shape by a positive SF from a point * Enlarge a shape by a positive fractional SF * Enlarge by a negative scale factor (H) * Work out missing sides and angles in a pair of similar shapes * Solve problems with similar triangles * Explore ratios in right-angled triangles | Block test – 20 minutes.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Exploring scale in art and design  **British Values:**  Appreciating symmetry and proportional reasoning  **Careers:**  Graphic Design, Architecture, Engineering  **Topic Misconceptions:**  Enlargement always results in shapes with the same dimensions; similar shapes are identical in size. |
|  | **1 week** | **Algebraic Representation** | * Drawing non-linear graphs * Interpreting quadratic graphs * Investigate graphs of simultaneous equations * Represent simple inequalities on a graph |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Using algebra in practical problem-solving  **British Values:**  Understanding patterns in different contexts  **Careers:**  AI Development, Programming, Economics  **Topic Misconceptions:**  Algebraic expressions always have a fixed form; solving equations is the only use for algebraic representation. |
|  | **2 weeks** | **End of Year Review/ Drop down** |  |  |  |  |

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|  | **Term** | **Duration** | **Topic** | **Key Skills, Content or Knowledge** | **Summative Assessment** | **Blended Learning** | **SMSC Links & British Values** |
|  | **Au.1**  **8 wks** | **1 week** | **Review of prior learning.** |  |  |  |  |
| **Year 10** |  | **3 weeks** | **Representing Solutions and Equations and Inequalities** | * Understand meaning of 'solution' in mat * Form and solve one and two step equations * Form and solve one and two step inequalities * Show solutions to inequalities on a number line * Interpret representation on number lines as inequalities * Represent solutions to inequalities using set notation (H) * Draw straight line graphs * Find solutions to equations using straight line graphs * Represent solutions to inequalities on a graph (H) * Solve quadratic equations by factorisation (H) * Solve quadratic inequalities in one variable (H) | Joint block test.  **Key Assessment 1.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral (Logical problem-solving)  **British Values:**  Rule of Law (Following structured methods)  **Careers:**  Engineering, Data Science, Economics  **Topic Misconceptions:**  Equations always have one solution; Inequalities and equations are the same; Solutions to inequalities are always exact values. |
|  | **3 Weeks** | **Trigonometry** | * Explore ratio in similar right-angled triangles * Work fluently with hypotenuse, opposite and adjacent sides * Use tangent ratio to find missing side lengths * Use the sine and cosine ratios to find missing side lengths * Use sine, cosine and tangent ratios to find missing lengths * Use sine, cosine and tangent to find missing angles * Select appropriate method to solve right-angled triangle problems inc. Pythagoras * Work with Key Angles in right-angled triangles * Use trigonometry in 3D shapes (H) * Understand and use the Sine rule for area of a triangle * Understand and use sine rule for lengths and angles (H) * Understand and use cosine rule to find lengths and angles (H) | Joint block test.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual (Role of triangles in nature)  **British Values:**  Individual Liberty (Using maths in navigation)  **Careers:**  Surveying, Astronomy, Architecture  **Topic Misconceptions:**  Trigonometric ratios (sine, cosine, tangent) can be used for all angles; Trigonometric functions only apply to right-angled triangles. |
|  | **1 week** | **Assessment** |  |  |  |  |
| **Au.2**  **6 wks** | **3 Weeks** | **Simultaneous Equations** | * Understand that equations can have more than one solution and determine whether (x,y) is a solution to a pair of equations * Solve a pair of linear simultaneous equations by substituting a known variable * Solve a pair of linear simultaneous equations by substituting an expression * Solve a pair of linear simultaneous equations using graphs * Solve a pair of linear simultaneous equations by subtracting or adding equations * Use a given equation to derive related facts * Solve linear simultaneous equations by multiplying one or two equations * Form and solve linear simultaneous equations from given information * Check an (x,y) solution to simultaneous equations one linear and one quadratic * Solve a pair of simultaneous equations (linear, quadratic) using graphs * Solve pair of simultaneous equations (linear, quadratic) algebraically * Solve pair of simultaneous equations involving a third unknown | Block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social (Teamwork in problem-solving)  **British Values:**  Democracy (Fair distribution in problem-solving)  **Careers:**  Computer Science, Engineering, Economics  **Topic Misconceptions:**  Simultaneous equations always have one solution; Solutions to simultaneous equations cannot be fractions or decimals.. |
|  | **3 Weeks** | **Congruency, Similarity and Enlargement** | * Enlarge a Shape by a Positive Scale Factor * Enlarge a shape aby a fractional scale factor * Enlarge a shape by a negative scale factor (H) * Identify Similar Shapes * Work out missing sides and angles in similar shapes * Use angles on parallel lines to find missing angles * Explore similar triangles * Explore area and volume in similar shapes (H) * Understand difference between congruency and similarity * Understand and use conditions for congruent triangles * Prove a pair of triangles are congruent (H) | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural (Historical contributions in geometry)  **British Values:**  Mutual Respect (Recognizing global contributions)  **Careers:**  Graphic Design, Engineering, Architecture  **Topic Misconceptions:**  Enlarging shapes changes their proportions; Two shapes must be congruent to be similar; All enlarged shapes are similar to the original.. |
| **Sp.1**  **6 wks** | **1 week** | **Trigonometry Recap** | * A recap of prior learning about Trigonometry. |  |  |  |
|  | **1 Week** | **Angles and Bearings** | * Use cardinal directions and related angles * Draw and interpret scale diagrams * Understand and represent bearings * Measure and read bearings * Make scale drawings using bearings * Calculate bearings using angle rules * Solve bearings problems using Pythagoras and trigonometry * Solve Bearing problems using sine and cosine rules | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social (Navigation and teamwork applications)  **British Values:**  Rule of Law (Following geometric rules)  **Careers:**  Aviation, Navigation, Geography  **Topic Misconceptions:**  Angles are measured from the north in bearings; Bearings are always measured in degrees; Angles in a triangle must always add to 180° (ignoring non-Euclidean geometry). |

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|  |  | **2 Weeks** | **Working with Circles** | * Recognise and label parts of a circle * Calculate fractional parts of a circle * Calculate the length of an arc * Calculate the area of a sector * Circle theorems: angle at centre and circumference (H) * Circle Theorems: Angles in a semi-circle (H) * Circle Theorem: Angles in the same segment (H) * Circle Theorem: Angles in a Cyclic Quadrilateral (H) * Understand and use volume of cylinder and cone * Understand use volume of sphere * Understand and use surface area of a sphere * Understand and use surface area of cylinder and cone * Solve area and volume problems involving similar shapes (H) | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual (Recognizing patterns in nature)  **British Values:**  Tolerance (Appreciating mathematics in different cultures)  **Careers:**  Design, Engineering, Astronomy  **Topic Misconceptions:**  The diameter is always twice the radius; All circles can be solved using the same formulae, regardless of context. |
|  | **2 weeks** | **Vectors (Higher classes 2 weeks, Foundation 1 week)** | * Understand and represent vectors * Use and read vector notation * Draw and understand vectors multiplied by a scalar * Draw and understand addition and subtraction of vectors * Explore vector journeys in shapes (H) * Explore quadrilaterals using vectors (H) * Understand parallel vectors (H) * Explore co-linear points using vectors (H) * Use vectors to construct geometric arguments and proofs (H) | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Social (Understanding transformations)  **British Values:**  Individual Liberty (Application in physics and engineering)  **Careers:**  Physics, Computer Science, Robotics  **Topic Misconceptions:**  Vectors can be added and subtracted like regular numbers; The length of a vector is the same as the distance between the start and end points. |
| **Sp.2**  **7 wks** | **2 weeks** | **Probability** | * Review 4 operations with fractions * Review sum of probabilities and equally likely outcomes * Use experimental data to estimate probabilities * Find probabilities from tables, Venn diagrams and frequency trees * Construct and interpret sample spaces for more than one event (R) * Calculate probability with independent events * Use tree diagrams for independent events * Use tree diagrams for dependent evens (non-replacement) * Construct and interpret conditional probabilities (tree diagrams) (H) * Construct and interpret conditional probabilities (Venn and two-way) (H) | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral (Decision making and assessing risk)  **British Values:**  Democracy (Understanding fairness and chance)  **Careers:**  Actuarial Science, Data Analytics, Finance  **Topic Misconceptions:**  The probability of two independent events occurring together is the sum of their probabilities; Probability is always between 0 and 1; The sum of probabilities of all events in a sample space is not always 1. |
| **Sp.2** | **2 Weeks** | **Ratios and Fractions** | * Compare quantities using a ratio (R) * Link ratios and fractions (R) * Share in a given ratio - given total or one part (R) * Use ratios and fractions to make comparisons * Link ratios and graphs * Solve problems with currency conversion * Link ratios and scales (R) * Use and interpret ratios of the form 1:n and n:1 * Solve best-buy problems * Combine a set of ratios * Link ratio and algebra * Ratio in area problems (H) * Ratio in volume problems (H) * Mixed ratio problems | Block test.  **Key Assessment 2.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | ***SMSC:***  *Social (Proportional reasoning in daily life)*  ***British Values:***  *Rule of Law (Ensuring fairness in calculations)*  ***Careers:***  *Catering, Engineering, Fashion Design*  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | Ratios always involve whole numbers; Fractions are only useful for parts of a whole and don’t relate to ratios or real-world applications. | |
|  | **2 Weeks** | **Percentages and Interest** | * Convert and compare FDP (R) * Work out percentages with and without a calculator (R) * Increase and decrease by a given percentage (R) * Express one number as a percentage of another (R) * Calculate simple and compound interest * Repeated percentage change * Find the original value after a percentage change (R) * Solve problems involving growth and decay * Understand iterative processes, ratios and fractions | End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral (Financial literacy and responsibility)  **British Values:**  Individual Liberty (Making informed financial choices)  **Careers:**  Banking, Accounting, Business  **Topic Misconceptions:**  Percentages can only increase; Simple interest and compound interest are the same thing; Percentages are always based on 100. |
|  | **1 week** | **Assessment and Review** |  |  |  |  |
| **Su.1**  **4 wks** | **3 Weeks** | **Collecting, Representing and Interpreting Data** | * Understand populations and samples * Construct a stratified sample (H) * Primary and secondary data * Construct and interpret frequency tables and polygons, bar charts, two-way tables * Construct and interpret pie charts * Criticise charts and graphs * Find and interpret averages from a list and table (R) * Construct histograms (H) * Construct and interpret stem and lead diagrams * Construct and interpret cumulative frequency diagrams (H) * Construct and interpret box plots and compare distributions * Construct scatter graphs, understand line of best fit and extrapolation | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural (Making informed decisions using data)  **British Values:**  Mutual Respect (Using statistics ethically)  **Careers:**  Market Research, Statistics, Data Science  **Topic Misconceptions:**  Data is always accurate and not subject to biases; The mean is always the best measure of central tendency; Visual representations of data can’t mislead |
|  | **1 week** | **Non-calculator methods** | * Mental and written methods for four operations including fractions (R) * Exact answers * Rational and irrational numbers (H) * Understand and use surds (H) * Calculate with surds (H) * Rounding to dp's, sf's (R) * Estimating calculations (R) * Understand limits of accuracy * Upper and lower bounds (H) * Use number sense * Solve financial maths problems * Break down and solve multi-step problems | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral (Encouraging independent problem-solving)  **British Values:**  Rule of Law (Developing structured problem-solving methods)  **Careers:**  Education, Mental Arithmetic Training  **Topic Misconceptions:**  Non-calculator methods are always slower; There is only one "right" way to do a non-calculator problem. |
| **Su.2**  **7 wks** | **2 Weeks** | **Types of number and number sequences** | * Understand factors, multiples, primes (R) * Express number as a product of its prime factors (R) * Find HCF and LCM of a set of numbers (R) * Describe and continue arithmetic and geometric sequences * Explore other sequences * Describe and continue sequences involving surds (H) * Find nth term of a linear sequence (R) * Find rule for nth term of a quadratic sequence (H) | End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Spiritual (Recognizing mathematical patterns)  **British Values:**  Tolerance (Respecting different mathematical systems)  **Careers:**  Cryptography, Programming, Artificial Intelligence  **Topic Misconceptions:**  Only whole numbers are real numbers; Arithmetic sequences are always linear; Geometric sequences are only exponential. |
|  | **1 Week** | **Indices and Roots** | * Square and cube numbers (R) * Calculate higher powers and roots * Powers of ten and standard form (R) * The addition and subtraction rule for indices (R) * Understand and use the power zero and negative indices * Work with powers of powers * Understand and use fractional indices (H) * Calculate with numbers in standard form (R) | **Key Assessment 3.**  An assessment designed to interleave prior and current learning | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Cultural (Understanding exponential growth and decay)  **British Values:**  Democracy (Fair application of mathematical rules)  **Careers:**  Science, Engineering, Economics  **Topic Misconceptions:**  Negative exponents result in negative numbers; Square roots only apply to perfect squares; All numbers have square roots. |
|  | **2 Weeks** | **Manipulating expressions** | * Simplify algebraic expressions (R) * Use identities * Add and subtract simple algebraic fractions (H) * Add and subtract complex algebraic fractions (H) * Multiply and divide simple algebraic fractions (H) * Multiply and divide complex algebraic fractions (H) * Form and solve equations and inequalities with fractions * Solve equations with algebraic fractions (H) * Represent numbers algebraically * Algebraic arguments and proof. |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Moral (Developing structured logical thinking)  **British Values:**  Rule of Law (Following mathematical rules and structures)  **Careers:**  Programming, Mathematics, Engineering  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | Expressions always simplify neatly; All terms can be combined in an expression as long as they look similar; Only terms with the same variable can be combined. | |
|  |  | **2 weeks** | **Assessments and Drop Down** |  |  |  |  |

In Year 11 students complete their GCSE curriculum. Kingstone High School chooses EDUQAS for the maths exam board.

<https://www.eduqas.co.uk/qualifications/mathematics-gcse/#tab_keydocuments>

Students in their final year spend an increasing amount of time reviewing previous material alongside new content to be covered from the national curriculum. In their examination preparation students also are expected to be increasingly independent both in class and at home. This works out in practice as using past papers in lesson, longer time revising content at home, revision for practice assessments in class. To allow for flexibility a guide for teacher planning and student learning is to cover each of the main areas of the maths curriculum. There will be time spent on Algebra, Number (inc. Ratio), Geometry, Probability and Statistics each half-term, with the class teacher choosing appropriate but challenging content for the class, ensuring as much of the curriculum is covered as possible prior to the examinations in Summer.

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|  | **Term** | **Duration** | **Topic** | **Key Skills, Content or Knowledge** | **Summative Assessment** | **Blended Learning** | **SMSC Links & British Values** |
| **Year 11** | **Au.1**  **8wks** | **2 weeks** | **Algebra 1** | * Algebraic Notation: * Use "ab" instead of "a × b" * Use "3y" instead of "y + y + y" or "3 × y" * Use "a²" instead of "a × a" and "a³" instead of "a × a × a" * Use "a²b" instead of "a × a × b" * Use "a ÷ b" for division * Write coefficients as fractions, not decimals * Use brackets for grouping * Substituting Numerical Values: * Substitute values into formulas and expressions, including scientific formulas * Mathematical Concepts: * Understand and use the vocabulary of expressions, equations, formulas, identities, inequalities, terms, and factors * Simplifying and Manipulating Algebraic Expressions: * Collect like terms * Multiply a single term over a bracket * Factor out common factors * Expand products of binomials * Factorize quadratic expressions (e.g., x² + bx + c, ax² + bx + c) * Complete the square * Simplify expressions with sums, products, and powers (including laws of indices) * Using Standard Mathematical Formulae: * Understand and use standard formulas * Rearrange formulas to change the subject * Equations vs Identities: * Know the difference between equations and identities * Use algebra to argue and prove equivalence of expressions * Functions: * Interpret simple expressions as functions (inputs and outputs) * Understand the reverse process as the “inverse function” * Understand the succession of two functions as a “composite function” | Joint block test.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Logical reasoning (Spiritual)  **British Values:**  Rule of law (Following logical structures)  **Careers:**  Engineering, Computer Science, Data Analysis  **Topic Misconceptions:**  - Equations with variables on both sides are always solved by simply moving terms across. - Negative signs outside brackets apply only to the first term inside. - Variables can be treated as constants in algebraic expressions. - "x" always represents multiplication. |
|  | **2 Weeks** | **Shape & Space 1** | * Use standard geometric terms (points, lines, vertices, edges, planes, etc.) * Label sides and angles of triangles correctly * Draw diagrams based on descriptions * Perform standard constructions (perpendicular bisector, perpendicular line from a point, angle bisector) * Solve locus problems using constructions * Know the shortest distance from a point to a line is perpendicular * Understand angles at a point, on a straight line, and vertically opposite angles * Apply alternate and corresponding angles on parallel lines * Use the sum of angles in triangles and polygons * Understand properties and definitions of special triangles, quadrilaterals, and other plane figures * Use basic triangle congruence criteria (SSS, SAS, ASA, RHS) * Apply angle facts, triangle congruence, similarity, and properties of quadrilaterals * Use results like Pythagoras’ Theorem and properties of isosceles triangles for proofs * Identify, describe, and construct congruent and similar shapes, including transformations (rotation, reflection, translation, enlargement) * Know and apply circle properties (center, radius, chord, diameter, tangent, arc, sector, segment) * Solve geometry problems on coordinate axes | Joint block test.  End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Appreciation of symmetry (Spiritual)  **British Values:**  Cultural heritage in architecture (Cultural)  **Careers:**  Architecture, Design, Surveying  **Topic Misconceptions:**  - All triangles are equilateral. - All angles in polygons add up to 180°. - Perimeter and area of shapes are the same. - Curved lines do not affect area calculations. |
|  | **2 Weeks** | **Number 1** | Order positive/negative integers, decimals, and fractions; use symbols =, ≠, <, >, ≤, ≥.  Apply four operations (addition, subtraction, multiplication, division) to integers, decimals, simple fractions, and mixed numbers (positive/negative); understand place value for large/small numbers and decimals.  Recognize relationships between operations (e.g., inverse operations); use correct order of operations, including brackets, powers, roots, and reciprocals.  Use concepts of prime numbers, factors, multiples, HCF, LCM, and prime factorization, including product notation and unique factorization theorem.  Apply systematic listing strategies, including the product rule for counting.  Use positive integer powers and real roots (square, cube, etc.); recognize powers of 2, 3, 4, 5; estimate powers and roots.  Calculate with roots and integer/fractional indices. | Block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Problem-solving in daily life (Moral)  **British Values:**  Responsibility in financial decisions (Moral)  **Careers:**  Finance, Accounting, Economics  **Topic Misconceptions:**  Negative numbers are always smaller than positive numbers. - Dividing by a fraction is the same as multiplying by that fraction. - The square of a number is always positive. - Decimal numbers are always smaller than fractions. |
|  | **1 Week** | **Probability & Statistics 1** | **Probability**   * Describe and analyse frequency of outcomes in probability experiments using tables and trees. * Use randomness, fairness, and equally likely events to calculate expected outcomes in future experiments. * Relate expected frequencies to theoretical probability, using the 0-1 probability scale. * Understand that probabilities of exhaustive outcomes and mutually exclusive events sum to one. * Understand that larger sample sizes lead to empirical results tending towards theoretical probabilities. * Enumerate sets and combinations using tables, grids, Venn diagrams, and tree diagrams. * Construct theoretical possibility spaces and calculate theoretical probabilities for single and combined experiments. * Calculate probabilities of independent and dependent combined events, using tree diagrams and other methods.   **Statistics**   * Infer population properties from samples, understanding sampling limitations. * Design and critique questionnaire questions, focusing on fairness. * Interpret and construct tables, charts, and diagrams (e.g., bar charts, pie charts, line graphs) for different types of data. * Analyze distributions of data using graphical representation and measures of central tendency (mean, median, mode) and spread (range, outliers). * Use statistics to describe a population. * Interpret scatter graphs for bivariate data, recognizing correlation, drawing lines of best fit, making predictions, and understanding extrapolation dangers. | End of term assessment | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Understanding fairness (Moral)  **British Values:**  Democracy (Fair chances and voting systems)  **Careers:**  Actuarial Science, Market Research  **Topic Misconceptions:**  - Probability can exceed 1. - The sum of probabilities of events must always be 100%. - A result of 50% chance means equal outcomes. - A higher frequency of one outcome means the probability is higher in future trials. |
|  | **1 Week** | **Algebra 2** | * Continued from Algebra 1 |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Abstract thinking (Spiritual)  **British Values:**  Justice and fairness in equations (Moral)  **Careers:**  Software Development, Artificial Intelligence |

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|  | | **Au2**  **6 wks** | | **1 Week** | | | **Algebra 2** | * Continued from Algebra 1 |  | |  | **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | - Expanding brackets always results in an increase in terms. - Negative signs can be dropped in equations with subtraction. - Solving for a variable means simplifying every term. | | |
|  | | **1 Week** | | | **Shape and Space 2** | * Continued from Shape and Space 1 | Joint block test.  End of term assessment. | | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | **SMSC:**  Geometry in cultural patterns (Cultural)  **British Values:**  Respect for artistic contributions (Cultural)  **Careers:**  Engineering, Architecture, Art & Design  **Topic Misconceptions:**  All quadrilaterals are parallelograms. - Angles in a triangle always add up to 360°.  - The area of a circle is calculated like a square's area. - 3D shapes are calculated using the same principles as 2D shapes.. | |
|  | | **4 weeks** | | | **Mock Exams & Review** |  |  | |  |  | |
|  | **Spr 1**  **6 wks** | | **1 Week** | | | **Algebra 3** | |  | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Logical problem-solving (Spiritual)  **British Values:**  Rule of law (Structured thinking)  **Careers:**  Robotics, Cryptography, Mathematical Research  **Topic Misconceptions:**  - Only linear equations can be solved using algebraic methods. - Quadratic equations can only have one solution. - Algebraic expressions are solved by trial and error, not logic. - All equations have solutions. |
|  | | **1 Week** | | **Shape & Space 3** | | |  | Block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Understanding transformations (Social)  **British Values:**  Respect for heritage in design (Cultural)  **Careers:**  Urban Planning, CAD Design  **Topic Misconceptions:**  - The volume of all 3D shapes can be found using the same formula. - A shape's area is only about its dimensions, ignoring angles. - In any polyhedron, all faces are polygons with equal sides. - The surface area of a 3D shape is always the same as its volume. |
|  | | **1 Week** | | **Probability & Statistics 2** | | |  | End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Ethical use of data (Moral)  **British Values:**  Individual liberty (Data privacy rights)  **Careers:**  Data Science, Risk Analysis, Finance  **Topic Misconceptions:**  - The expected outcome of probability is always what happens. - If one event occurs in a sequence, it affects the probability of others. - Statistics always accurately represent the population. - A "random" sample always reflects the general population perfectly. |
|  | | **1 Week** | | **Number 3** | | |  | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Application of number in trade (Social)  **British Values:**  Tolerance of global financial systems (Cultural)  **Careers:**  Accounting, Business, Stock Trading  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | - Larger numbers always mean higher values. - Every number in a sequence is equally spaced. - A number raised to a power is always positive. - Decimal numbers are always more precise than fractions. | |
|  | | **1 Week** | | **Algebra 4** | | |  | Joint block test.  End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Critical thinking in problem-solving (Spiritual)  **British Values:**  Democracy (Fair reasoning and debate)  **Careers:**  Artificial Intelligence, Engineering  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | - Solving algebraic fractions is the same as solving normal fractions. - Quadratic equations have two solutions only. - Powers and roots can be simplified without considering signs. - Exponential equations are always solved by trial and error. | |
|  | | **1 Week** | | **Shape & Space 4** | | |  | End of term assessment. | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Understanding natural patterns (Spiritual)  **British Values:**  Respect for cultural contributions (Cultural)  **Careers:**  Architecture, Graphic Design  **Topic Misconceptions:**  - 3D shapes can always be approximated as 2D shapes. - The surface area of irregular shapes is the same as regular ones. - Distances between points on a graph can be measured like the sides of a polygon. - Shapes with the same perimeter always have the same area. |
| **Sp2**  **7 wks** | | **1 Week** | | **Probability & Statistics 3** | | |  | End of year exam | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Decision making and consequences (Moral)  **British Values:**  Rule of law (Statistical evidence in justice)  **Careers:**  Legal Analysis, Forensic Science  **Topic Misconceptions:**  - The probability of two independent events occurring can always be added. - A statistical mode is always the most useful measure. - Sampling methods can always be generalized to the entire population. - The range of data tells you everything about the distribution. |
|  | | **1 Week** | | **Number 4** | | |  |  | Weekly, Sparx maths online learning platform that uses AI technology to adapt learning and provide a personalised homework experience. | | **SMSC:**  Logical reasoning in calculations (Spiritual)  **British Values:**  Tolerance of different numerical systems (Cultural)  **Careers:**  Economics, Banking, Investment  **Topic Misconceptions:**   |  | | --- | |  |  |  | | --- | | - All numbers in an arithmetic sequence are integers. - The result of dividing fractions is always smaller than 1. - Rational numbers can’t be decimals. - Estimations are not required when working with significant figures. | |
|  |  | | **1 Week** | | **Priority & Mixed Revision for Mock Exams** | | |  |  |  | |  |
|  | | **4 Weeks** | | **Mock Examinations & Review** | | |  |  |  | |  |
| **Sum 1**  **4 wks** | | **4 weeks** | | **Priority Topics, Mixed Revision** | | |  |  |  | |  |
| **Sum 2** | |  | | **Study Leave** | | |  |  |  | |  |