



Subject: Mathematics

Lead Teacher: Mrs Roberts

Year: 9

Curriculum organisation

The students are placed in sets following their performance in assessments throughout year 8 – a set A, a set B and two parallel ability set Cs. Each group of 30 students are taught for three hours per week.

Set A and B - Overview of Topics & Key Information

How will your child be learning?

Term	Unit(s) of Work	Key Enquiry Questions	Key Content/ Terminology	Skills developed	How will your child be learning?
Autumn Term	- Number properties - Algebra - Linear equations - Angles - Sequences	- What are prime numbers? - What does product of prime numbers mean? - Create as many different factor trees as possible for 24. Use each of them to write 24 as a product of its prime factors. What do you notice? - What methods can be used to find the least common multiple (LCM) and highest common factor (HCF) of two whole numbers? Which is the most efficient method? - Find two numbers given the LCM and HCF. How many solutions can you find? - What is the difference between an equation and an identity? - How do you simplify an expression? - Which of the following expressions are equivalent? What does equivalence mean? - How do you solve an equation? - Do all equations have a solution? Give an example	- Prime numbers, product, factors, factorisation, factor tree, HCF, LCM - Expressions, equations, identities, expand, factorise, terms, formulae - Equations, rearrangements, elimination, solution - Angles, parallel, corresponding, alternate, allied, polygons, regular, irregular, interior, exterior, bearings - Position-to- term, term-to-term, finite, infinite, ascending, descending, square, cube, triangular, arithmetic, quadratic, geometric	- Drawing factor trees; express a whole number as a product of its prime factors; find the LCM and HCF of two whole numbers - Collecting like terms; multiplying and dividing terms; expanding single, double and triple brackets; factorising expressions by recognising common factors; use algebra to solve problems in different contexts; rearrange formulae to change the subject - Form and solve linear equations - Calculate missing angles in regular and irregular polygons - Recognise special types of sequences; find terms in a sequence using the position-to-term rule and term-to-term rule; find the nth term rule and be able to use it for an arithmetic sequence, quadratic sequence and a geometric sequence	- Whole class discussion - Pair work - Problem-solving tasks - Independent work - Group work - Investigations

		of an equation with two solutions. • What angle facts do you know? • How do we know angles in a triangle add to 180°? • How do we find the missing angle in a polygon? • What would be the 100th term for a given sequence? Is there an easier way of finding these unknown terms? • How can we use the nth term rule to decide if a given number is a term in the sequence?			
Spring Term	• Decimals • Fractions • Percentages • Straight line graphs • Transformations • Pythagoras • Trigonometry • Ratio and proportion	• How do we prove if a fraction is a terminating or recurring decimal? • Is it always, sometimes or never true that a fraction with a denominator that is a prime number will terminate? • People often round $\frac{1}{3}$ to 0.3 and $\frac{2}{3}$ to 0.7. In which case is the percentage error greater? • A line has equation $3x - 2y + 4 = 0$. Determine the coordinate of the point it intercepts the x-axis and the gradient. • A line goes through the point (9,10) and is perpendicular to another line with equation $y = 3x + 2$. What is the equation of the line? • What single transformation maps A onto B?	• Decimal, recurring, terminating, fraction, improper, mixed, equivalent, multiples, factors, numerator, denominator, percentage increase, decrease, change, reverse, depreciation, simple interest, compound interest • Linear, quadratic, cubic, reciprocal, gradient, y-intercept, parallel, perpendicular, parabola, coordinate, axes, equation, formulae, function • Transformations, reflection, rotation, translation, enlargement, Image, object, centre, clockwise, Anti-clockwise, vector, scale factor • Pythagoras' theorem, trigonometry, right angle,	• Adding, subtracting, multiplying and dividing with fractions and decimals • Converting between fractions, decimals and percentages; convert a fraction to a recurring decimal and vice versa • Calculate a percentage of a quantity; increase or decrease a quantity by a given percentage; percentage change; find the original value • Plot and draw graphs of linear functions; interpret and analyse information presented in these • Find the equation of a given line, gradient and distance between two points; find the equation of parallel and perpendicular lines • Reflect, rotate, translate and enlarge a given shape, perform a combination of transformations; recognise and fully describe transformations	

		• How can we prove that a triangle is a right-angle triangle? • A square has a diagonal measurement of 130cm. What is the length of one side? • The ratio of boys to girls is 5:7. There are 8 more girls than boys. How many boys are there? • Can you draw graphs for direct proportion or inverse proportion?	hypotenuse, adjacent, opposite, ratio, sine, cosine, tangent, elevation, depression, diagonal, plane, square, square root • Ratio, share, proportion, direct, indirect, inverse, square, cube, square root, cube root, constant	• Use Pythagoras to find the unknown side in a right-angle triangle; use trigonometry to find an unknown side or angle in a right-angle triangle; use this to solve 3d problems • Simplify a ratio; share quantities in a given ratio, combining or splitting ratios, problem solving with ratios; formulate equations and solve problems involving quantity in direct proportion or inverse proportion	
Summer Term	• Simultaneous equations • Indices • Surds • Standard form • Construction and Loci • Units and measures	• Two numbers have a sum of 34 and a difference of 12, what are they? • Write 32×16 as a power of 2. • Evaluate $8^{\frac{2}{3}}$. • Work out the value of n in $40 = 5 \times 2^n$. • Write 51080 in standard form. • Write 3.74×10^{-6} as an ordinary number. • How would you add, subtract, multiply and divide with numbers in standard form, no calculator allowed? • Simplify $\sqrt{8}$. • Prove that the square root of 45 lies between 6 and 7. • Expand and simplify $(\sqrt{3} + 2)(\sqrt{3} - 1)$. • How can we construct an angle of 90°, 45°, 30° and 60° using only a compass, ruler and pencil? • Convert 147kg into pounds.	• Equation, formula, simultaneous, variable, substitute, rearrange, simplify, expand, factorise, brackets, linear eliminate, term, coefficient. • Index, base, power, inverse, reciprocal, numerator, denominator • Surds, rational, irrational, brackets, rationalise • Power, base, standard form • Construction, loci, equidistant, bisect, perpendicular, parallel, mid-point, bearing, scale drawing • Speed, distance, time, density, mass, volume, pressure, force, area, units, average, capacity	• Set up and solve a pair of simultaneous equations using elimination, substitution and graphical methods • Use index laws to simplify and calculate the value of an expression involving multiplication and division of integer powers, fractional and negative powers, powers of powers • Use surds in exact calculations without a calculator; simplify expressions with surds, including rationalising denominators • Convert large and small numbers into standard form and vice versa; add, subtract, multiply and divide numbers in standard form without a calculator • Construct a perpendicular to a given line from/at a given point, perpendicular bisector of a line segment and an angle bisector; use this to find and describe regions satisfying a combination of loci • Use and convert standard units of measurements for length, area, volume/capacity, mass, time and money	

		• A brick has volume 840 cm³ and mass 2058g. Find the density of the brick in kg/m³. • How can I find the bearing of A to B if I know the bearing of B from A? • A boat travels 9km due south and then 7km due east. What bearing must it travel to return directly to base?		• Use and convert compound units e.g. for speed, rates of pay, density, pressure; apply compound measures formulae • Find and calculate bearings and draw accurate scale drawings using bearings	
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Set C - Overview of Topics & Key Information					How will your child be learning?
Term	Unit(s) of Work	Key Enquiry Questions	Key Content/ Terminology	Skills developed	
Autumn Term	• Number properties • Algebra • Linear equations • Angles • Sequences	• What are prime numbers? • What does product of prime numbers mean? • Create as many different factor trees as possible for 24. Use each of them to write 24 as a product of its prime factors. What do you notice? • What methods can be used to find the least common multiple (LCM) and highest common factor (HCF) of two whole numbers? Which is the most efficient method? • Find two numbers given the LCM and HCF. How many solutions can you find? • What is the difference between an equation and an identity? • How do you simplify an expression? • Which of the following expressions are equivalent?	• Prime numbers, product, factors, factorisation, factor tree, HCF, LCM • Expressions, equations, identities, expand, factorise, terms, formulae • Equations, rearrangements, elimination, solution • Angles, parallel, corresponding, alternate, allied, polygons, regular, irregular, interior, exterior, bearings • Position-to- term, term-to-term, finite, infinite, ascending, descending, square, cube, triangular, arithmetic, quadratic, geometric	• Drawing factor trees; express a whole number as a product of its prime factors; find the LCM and HCF of two whole numbers • Collecting like terms; multiplying and dividing terms; expanding single, double and triple brackets; factorising expressions by recognising common factors; use algebra to solve problems in different contexts; rearrange formulae to change the subject • Form and solve linear equations • Calculate missing angles in regular and irregular polygons • Recognise special types of sequences; find terms in a sequence using the position-to-term rule and term-to-term rule; find the nth term rule and be able to use it for an arithmetic sequence, quadratic sequence and a geometric sequence	• Whole class discussion • Pair work • Problem-solving tasks • Independent work • Group work • Investigations

		What does equivalence mean? • How do you solve an equation? • Do all equations have a solution? Give an example of an equation with two solutions. • What angle facts do you know? • How do we know angles in a triangle add to 180°? • How do we find the missing angle in a polygon? • What would be the 100th term for a given sequence? Is there an easier way of finding these unknown terms? • How can we use the nth term rule to decide if a given number is a term in the sequence?			
Spring Term	• Decimals • Fractions • Percentages • Straight line graphs • Transformations • Pythagoras • Trigonometry • Ratio and proportion	• How do we prove if a fraction is a terminating or recurring decimal? • Is it always, sometimes or never true that a fraction with a denominator that is a prime number will terminate? • People often round $\frac{1}{3}$ to 0.3 and $\frac{2}{3}$ to 0.7. In which case is the percentage error greater? • A line has equation $3x - 2y + 4 = 0$. Determine the coordinate of the point it intercepts the x-axis and the gradient. • A line goes through the point (9,10) and is perpendicular to another line with equation	• Decimal, recurring, terminating, fraction, improper, mixed, equivalent, multiples, factors, numerator, denominator, percentage increase, decrease, change, reverse, depreciation, simple interest, compound interest • Linear, quadratic, cubic, reciprocal, gradient, y-intercept, parallel, perpendicular, parabola, coordinate, axes, equation, formulae, function • Transformations, reflection, rotation, translation, enlargement,	• Adding, subtracting, multiplying and dividing with fractions and decimals • Converting between fractions, decimals and percentages; convert a fraction to a recurring decimal and vice versa • Calculate a percentage of a quantity; increase or decrease a quantity by a given percentage; percentage change; find the original value • Plot and draw graphs of linear functions; interpret and analyse information presented in these • Find the equation of a given line, gradient and distance between two points; find the equation of parallel and perpendicular lines	

		$y = 3x + 2$. What is the equation of the line? • What single transformation maps A onto B? • How can we prove that a triangle is a right-angle triangle? • A square has a diagonal measurement of 130cm. What is the length of one side? • The ratio of boys to girls is 5:7. There are 8 more girls than boys. How many boys are there? • Can you draw graphs for direct proportion or inverse proportion?	Image, object, centre, clockwise, Anti-clockwise, vector, scale factor • Pythagoras' theorem, trigonometry, right angle, hypotenuse, adjacent, opposite, ratio, sine, cosine, tangent, elevation, depression, diagonal, plane, square, square root • Ratio, share, proportion, direct, indirect, inverse, square, cube, square root, cube root, constant	• Reflect, rotate, translate and enlarge a given shape, perform a combination of transformations; recognise and fully describe transformations • Use Pythagoras to find the unknown side in a right-angle triangle; use trigonometry to find an unknown side or angle in a right-angle triangle; use this to solve 3d problems • Simplify a ratio; share quantities in a given ratio, combining or splitting ratios, problem solving with ratios; formulate equations and solve problems involving quantity in direct proportion or inverse proportion	
Summer Term	• Simultaneous equations • Indices • Surds • Standard form • Construction and Loci • Units and measures	• Two numbers have a sum of 34 and a difference of 12, what are they? • Write 32×16 as a power of 2. • Evaluate $8^{\frac{2}{3}}$. • Work out the value of n in $40 = 5 \times 2^n$. • Write 51080 in standard form. • Write 3.74×10^{-6} as an ordinary number. • How would you add, subtract, multiply and divide with numbers in standard form, no calculator allowed? • Simplify $\sqrt{8}$. • Prove that the square root of 45 lies between 6 and 7. • Expand and simplify $(\sqrt{3} + 2)(\sqrt{3} - 1)$. • How can we construct an angle of 90°, 45°, 30° and	• Equation, formula, simultaneous, variable, substitute, rearrange, simplify, expand, factorise, brackets, linear eliminate, term, coefficient. • Index, base, power, inverse, reciprocal, numerator, denominator • Surds, rational, irrational, brackets, rationalise • Power, base, standard form • Construction, loci, equidistant, bisect, perpendicular, parallel, mid-point, bearing, scale drawing • Speed, distance, time, density, mass, volume, pressure, force, area, units, average, capacity	• Set up and solve a pair of simultaneous equations using elimination, substitution and graphical methods • Use index laws to simplify and calculate the value of an expression involving multiplication and division of integer powers, fractional and negative powers, powers of powers • Use surds in exact calculations without a calculator; simplify expressions with surds, including rationalising denominators • Convert large and small numbers into standard form and vice versa; add, subtract, multiply and divide numbers in standard form without a calculator • Construct a perpendicular to a given line from/at a given point, perpendicular bisector of a line segment and an angle bisector; use this to find and describe regions satisfying a combination of loci	

		60° using only a compass, ruler and pencil? • Convert 147kg into pounds. • A brick has volume 840 cm ³ and mass 2058g. Find the density of the brick in kg/m ³ . • How can I find the bearing of A to B if I know the bearing of B from A? • A boat travels 9km due south and then 7km due east. What bearing must it travel to return directly to base?		• Use and convert standard units of measurements for length, area, volume/capacity, mass, time and money • Use and convert compound units e.g. for speed, rates of pay, density, pressure; apply compound measures formulae • Find and calculate bearings and draw accurate scale drawings using bearings	
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Equipment needed for lessons	How will learning and progress be assessed?
- Standard school stationery (Pencil, Blue/Black Pen, Green Pen, Rubber, Sharpener, Ruler, Whiteboard pen) - Exercise book - Scientific Calculator - Pair of Compasses - Protractor	- End of half term tests - Formal assessment week - Peer and self-assessment - Homework tasks - Retrieval practice activities

Extension & Enrichment opportunities	What can you do to support your child?
- UKMT Intermediate mathematics challenge - Mathematics team challenge	- Several websites are very useful that include videos, questions and worked through examples, these are: mymaths.co.uk, corbettmaths.com, mathsgenie.co.uk and drfrostmaths.com - Encourage regular revision
Inclusion	Inclusion within Y9 Maths

• Teachers follow student passports to ensure that the needs of all students with SEND are met. • Work is enlarged to the necessary size for visually impaired students. • Teachers will ensure that classrooms are quiet learning environments where possible and will dim lights to support students with sensory needs. • Students have the use of laptop if they have a SEND need whereby use of a laptop supports them. • Hearing impaired students are supported through use a radio aid and teachers ensure that students can lip read at all times during lessons. • Dyslexic students are encouraged to use coloured overlays when they are required to read long passages. • Use of dyslexic friendly fonts and coloured backgrounds used in PowerPoints/resources. • Students with ADHD are given movement breaks, fidget toys and lessons are 'chunked' to aid concentration. • Students are seated according to their needs, students work with the SENDCo to decide upon this.	• Equipment is adapted wherever necessary to accommodate the needs of students with SEND • Where necessary, pupils are given frequent one to one tutorials to revisit previous topics and methods taught to support their understanding • Pupils are provided with online resources to help with learning outside of the classroom and homework, such as videos and worked examples • Students have access to spare mathematical equipment to help with organisation
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If you have any questions about this Learning Overview, please contact the named Teacher above.