

Sandhill View

Maths Curriculum Policy

Achieve Aspire Enjoy

Aim

Academy Aim

Here at Sandhill View Academy, we aim to securely prepare all of our students for life beyond school as successful, confident, responsible and respectful citizens. We believe that education provides the key to social mobility and our curriculum is designed to build strong MAPs in the knowledge, understanding and skills which lead to academic and personal success. We want our students to enjoy the challenges that learning offers. Ultimately, we want students to 'Know More, Do More and Go Further'

Our aims are underpinned by a culture of high aspirations. Through developing positive relationships, we work towards every individual having a strong belief in their own abilities so that they work hard, build resilience and achieve their very best.

The curriculum includes formal teaching through subject areas, assemblies and extracurricular activities. We regularly review content to ensure we continue to meet our curriculum aims. The mathematics curriculum is planned to enable all students to develop deep understanding and skills in the following areas:

- Number
- Algebra
- Ratio, proportion and rates of change
- Geometry and measures
- Probability
- Statistics

All students are taught in a way which supports them to develop fluency, reason mathematically and solve problems linked to real life situations, by applying the knowledge and skills they have developed over time.

Throughout our programmes of study, every attempt is made to make explicit links to careers, the world of work and other life experiences. In addition to subject specific links, we aim to explicitly reinforce the skills and aptitudes which support employers say are important in the workplace. Maths is a core subject which has huge overlay in many fields, the transferable skills are a constant throughout the curriculum;

- Resilience (Aiming High, Staying Positive, Learning from Mistakes)
- Collaboration (Teamwork, Leadership, Communication)
- Creativity (Originality, Problem Solving, Independent Study)

The British values of democracy, the rule of law, individual liberty, and mutual respect of those with different faiths and beliefs are taught explicitly and reinforced in the way in which the school operates.

Key Stage 3 and Key Stage 4 Curriculums

Our curriculum covers Key Stage 3 (years 7, 8 and 9) and Key Stage 4 (years 10 and 11).

The decision to follow a mastery approach to the SOW was based on the research that suggests mastery can lead to around 'an additional five months' progress' for students (EEF, 2019). The new curriculum at KS3 has also been supported through developing links with Feeder Primaries and their knowledge of historically weaker strands at KS2.

Mathematics curriculum policy 24-25 The department where everybody counts

Over the last 2 years we have been on a mastery journey which included the use of concrete pictorial and abstract, celebrating things like 'BARVEMBER', emphasising this is for all and not the weaker students. Student voice demonstrated the appreciation for mastery tools and so this is embedded into several topics within the scheme of work.

Literacy

We know that students who read well achieve well. As such students should use a good standard of literacy at all times including the use of capital letters, full stops and full sentences where appropriate. The mathematics department actively supports the whole school literacy priorities, including the use of the marking codes; the use of Frayer models; the use of ambitious vocabulary and any additional priorities that can help develop our students reading abilities.

KNOW MORE: Our Key Stage 3 Mathematics Curriculum includes the following areas of study:

Three-year KS3 with 4.5 hours per week allocated to Mathematics.

| KS3 | Half Term 1 6 hours | Half Term 2 7 weeks | Half Term 3 7 weeks | Half Term 4 6 weeks | Half Term 5 6 weeks | Half Term 6 6 weeks |
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| Year 7 | <p><u>LAP:</u> Students will focus on developing more fluency in basic number skills including addition, subtraction, multiplication and division, to include times tables.</p> <p><u>MAP & HAP</u> Students will review basic number skills before moving on to look at standard form calculations; rounding to decimal places and significant figures; recognising angles and working with</p> | <p>All students will study different types of numbers including: negatives, powers, squares, cubes, factors, multiples and primes. In addition all students will study area and perimeter.</p> <p><u>LAP:</u> Students will also look at recognising angles and angle facts.</p> <p><u>MAP:</u> Students will also study an introduction to algebra including simplifying,</p> | <p>All students will study probability including working with frequency spaces. In addition all students will study aspects of data including bar charts, scatter graphs and pie charts.</p> <p><u>LAP</u> students will also take part in an exciting ratio cross-curricular project with art at this time.</p> <p><u>MAP & HAP</u> Will also study solving equations with one and two unknowns.</p> <p><u>HAP</u></p> | <p>All students: Will study BIDMAS, estimation, conversions, bisectors and congruence.</p> <p><u>MAP</u> Students will also study similarity as well as taking part in their exciting ratio cross-curricular project with art.</p> <p><u>HAP</u> Will also study index laws and probability rules including the and/or laws.</p> | <p><u>LAP:</u> Students will study plans & elevations; telling the time and working with speed distance time and solving equations.</p> <p><u>MAP & HAP</u> Students will study telling the time and working with time problems fluently. Students will also study speed distance and time, as well as all skills relating to fractions.</p> | <p><u>LAP:</u> Students will expand single brackets, as well as working with fractions in a number of form.</p> <p><u>MAP & HAP</u> Students will study plotting graphs in the form $y =$, $x =$, linear and quadratic graphs. Students will also study plans and elevations.</p> <p>All students: Will study fermi problems to work on their ability to work imaginatively with estimation and dimensional analysis.</p> |

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| | angle facts e.g. that angles in a triangle add up to 180 degrees. | expanding and factorising brackets. <u>HAP:</u> In addition these students will study angles in parallel lines; working with algebraic area and perimeter; HCF and LCM. HAP students will also take part in an exciting ratio cross-curricular project with art at this time. | In addition HAP students will study expanding and factorising single and double brackets. | | | |
| Year 8 | All students will cover ordering numbers with LAP students focusing on integers and MAP & HAP students looking at fractions and decimals. All students will cover negative numbers; sequences and their links with nth term and expansion of double brackets, alongside substitution. | <u>LAP</u> Students will look at probability facts including probability on a line and from a table. Students will also cover fraction, decimal and percentage knowledge I depth. <u>MAP & HAP</u> Students will look at decimals, sharing and simplifying ratio and percentages including working with percentages greater than 100%. <u>HAP</u> Students will also look at percentage change and reverse percentages. | <u>LAP</u> Students will study coordinates, leading to plotting graphs in the form $y = mx + c$. Students will also look at equations of circles and solving equations with unknowns on both sides. <u>MAP & HAP</u> Students will study ratio recipes and best buys. They will also study all four transformations. In this term speed, distance, time will also be covered to include graphs and inequalities will be started (basics and representations on a number line). | All students will study solving inequalities, which is a continuation from term 3. In addition, students will study area, perimeter, volume and surface area. <u>MAP</u> Students will also look at equations of circles and percentage change, as well as reverse percentages. <u>HAP</u> Students will also consider surface area of more complex shapes such as triangular prisms. | All students will study bisectors and the construction of triangles. LAP students will also study ratio including recipe and best buy problems. <u>MAP & HAP</u> Students will study probability, which is a continuation from previous learning as well as plotting graphs in the form $x =$ and $y =$ | All students will have the opportunity to take part in an exciting model village project this term. <u>LAP</u> Students will study Venn diagrams as well as the four transformations. <u>MAP & HAP</u> Students will study plotting linear and quadratic graphs as well as averages. <u>HAP</u> Students will be able to find midpoints and endpoints using coordinates. Students will also be able to calculate averages from tables. |
| Year 9 | All students will study number topics, indices, powers and roots; units and conversions and angles. | All students will study elements of algebra including simplifying; substituting; sequences and graphs. Students will additionally study | All students will study transformations, ratio and statistics. <u>LAP</u> Students will also study solving equations and standard form. | All students will study proportion and fractions, decimals and percentages. <u>LAP</u> students will also study forming | All students will study area, perimeter, volume and surface area. All students will also study equations and inequalities. | All students will study probability. All students will also have the opportunity to take part in a fun and engaging enlargement project. |

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| | | <p>calculations and accuracy as well as constructions and loci.</p> <p><u>LAP</u> students will spent time looking at shape. Whereas MAP students will study constructions and functions.</p> <p><u>HAP</u> students will progress to more complex areas of accuracy including standard form.</p> | <p><u>MAP & HAP</u> students will expand solving equations to include forming them.</p> <p><u>HAP</u> students will in addition study probability.</p> | <p>equations and circles.</p> <p><u>MAP</u> Students will also study probability.</p> <p><u>HAP</u> Students will also study functions.</p> | <p><u>LAP</u> Students will study functions and probability in addition to this.</p> <p><u>HAP</u> students will also study constructions and loci.</p> | <p><u>LAP</u> Students will also study direct proportion.</p> <p><u>MAP & HAP</u> will also study Pythagoras' theorem but only HAP students will study trigonometry.</p> |
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KNOW MORE: Our Key Stage 4 Curriculum

The KS4 Curriculum is taught over 2 years and each class has 5 hours of mathematics in classes based on ability, set changes can be made when students would see an improvement in a different classroom environment, this could be as simple as pace of lessons. At Key Stage 4 students follow the OCR GCSE Mathematics specification.

| KS4 | Half Term 1 6 hours | Half Term 2 8 weeks | Half Term 3 6 weeks | Half Term 4 5 weeks | Half Term 5 6 weeks | Half Term 6 6 weeks |
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| Year 10 | <p><u>HAP</u> Students will study linear graphs alongside parallel and perpendicular lines</p> <p><u>MAP</u> Students will study angles, lines & symmetry, sequences & graphs and linear equations</p> <p>LAP students will study polygons and parallel lines</p> | <p><u>HAP</u> Students will study probability, real life graphs, equations & inequalities and ratio & proportion.</p> <p><u>LAP & MAP</u> Will study fractions decimals and percentages as well as probability.</p> <p>MAP students will also study perimeter, area, volume and surface area. Whereas LAP students will study symmetry, similarity & congruence.</p> | <p><u>HAP</u> Students will study transformations; constructions and loci; averages and ranges and symmetry, similarity & congruence.</p> <p><u>LAP & MAP</u> Will study expanding & simplifying and real life graphs.</p> <p>In addition LAP students will study perimeter, area & volume. Whereas MAP students will study similarity, congruence & inequalities.</p> | <p><u>HAP</u> Students will study surds; further trigonometry; accuracy & bounds.</p> <p><u>LAP & MAP</u> Students will study ratio & proportion, transformations and averages. In addition MAP students will study accuracy and bounds whereas LAP students will study pie charts.</p> | <p><u>HAP</u> Students will study solving quadratic equations</p> <p><u>LAP & MAP</u> Students will study constructions & loci, compound measures and formulae and rearranging. In addition MAP students will study</p> | <p><u>HAP</u> Students will study quadratic, cubic & other graphs; dating & sampling; algebraic fractions; cumulative frequency, box plots & histograms and bearings</p> |

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| Year 11 | <p><u>HAP</u> Students will study sampling, forming & solving equations, quadratics, sine & cosine and graphs. From lockdown 1 students will also revisit Pythagoras & trig and equations & inequalities</p> <p><u>MAP & LAP</u> Students will study expanding & factorising and polygons & parallel lines.</p> <p>LAP students will also study probability and circles. Whereas MAP students will study ratio & proportion and solving equations & inequalities.</p> | <p><u>HAP</u> Students will study transformations of graphs as well as ratio & proportion and area & volume from lockdown 1.</p> <p><u>MAP & LAP</u> Students will study perimeter, area and volume and loci.</p> <p><u>MAP</u> students will also student circles, arcs & sectors and forming equations. Whereas LAP students will study constructions, ratio & proportion.</p> | <p><u>HAP</u> Students will study bearings, vectors, proof, equations of circles, $y = mx + c$, iterations and loci as well as probability from lockdown 1.</p> <p><u>MAP</u> Students will study Pythagoras & trigonometry, graphs, Venn diagrams and percentages.</p> <p>LAP Students will study functional skill numeracy, types of number, fractions, decimals, percentages and solving equations.</p> | <p><u>HAP</u> Students will study circle theorems, as well as fractions, decimals and percentages from lockdown 1.</p> <p><u>MAP & LAP</u> Will focus on revision</p> | Revision & exams | Revision & exams |
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DO MORE: Milestone assessment end points

| | Basic (Lower Ability End Points) | Clear (Middle Ability End Points) | Detailed (High Ability End Points) |
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| 7 | <ul style="list-style-type: none"> All students should be able to solve simple equations with one variable on one side All students should be able to represent an unknown number using a letter All students should be able to write and understand algebraic expressions from a given context All students should be able to collect like terms and simplify expressions Most students should be able to multiply algebraic expressions Some students should be able to expand single brackets All students should be able to calculate volume via simple cube counting. All students should be able to find the perimeter of a range of shapes. All students should be able to find the area of rectangles and triangles. All students should be able to recognise basic shape names. All students should be able to recognise acute, right, obtuse and reflex angles All students should be able to measure acute and obtuse angles All students should be able to classify triangles and quadrilaterals according to their properties All students should be able to draw acute and obtuse angles. All students should be able to use a ruler to draw a line to a specified length within 1mm Most students should be able to estimate the size of any given angle Most students should be able to know and use the | <ul style="list-style-type: none"> All students should be able to find missing values in calculations such as: $? + 4 = 7$ All students should be able to multiply expressions such as: $y \times y = y^2$ All students should be able to represent an unknown number using a letter All students should be able to write and understand algebraic expressions from a given context All students should be able to collect like terms and simplify expressions All students should be able to substitute values into expressions and formulae All students should be able to multiply algebraic expressions All students should be able to solve simple equations with one variable on one side Most students should be able to solve simple equations with variables on both sides Most students should be able to expand single brackets Most students should be able to expand double brackets Some students should be able to factorise into single brackets Some students should be able to factorise into double brackets All students should be able to name of basic 2D and 3D shapes All students should be able to identify edges, vertices and faces All students should be able to recognise acute, right, obtuse and reflex angles All students should be able to draw and measure acute and obtuse angles | <ul style="list-style-type: none"> All students should be able to recognise acute, right, obtuse and reflex angles All students should be able to draw and measure acute and obtuse angles All students should be able to estimate the size of any given angle All students should be able to classify triangles and quadrilaterals according to their properties All students should be able to know and use the fact that the interior angles of a triangle sum to 180° All students should be able to know and use the fact that the interior angles of a quadrilateral sum to 360° All students should be able to calculate simple missing angles in parallel lines. Some students should be able to use terminology such as alternate angles, corresponding angles and supplementary angles All students should be able to find the perimeter of a range of shapes. All students should be able to find the area of rectangles, triangles, compound shapes and trapeziums. All students should be able to construct regular polygons with circles All students should be able to construct the locus of points equidistant from two fixed points All students should be able to construct the locus of points equidistant from two fixed lines All students should be able to appreciate when two shapes are congruent All students should be able to find the volume of cubes and cuboids All students should be able to appreciate when two shapes are similar and understand that |

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| | <p>fact that the interior angles of a triangle sum to 180°</p> <ul style="list-style-type: none"> • Most students should be able to know and use the fact that the interior angles of a quadrilateral sum to 360° • Most students should be able to draw angles to draw a specified angle to within 1° • All students should be able to use a calculator efficiently, particularly for squaring negative numbers, fractions and mixed numbers • All students should be able to find squares, cubes and roots • All students should be able to identify and understand the importance of prime numbers • All students should be able to make simple estimates • All students should be able to know how to tell the time using an analogue clock • All students should be able to shade $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$ of a shape • All students should be able to shade unit fractions • All students should be able to add and subtract fractions with the same numerator. • Most students should be able to multiply and divide fractions. • Most students should be able to work with negative numbers using all four operations. • Most students should be able to order negative numbers • Most students should be able to work with factors and multiples • Most students should be able to read from timetables • Some students should be able to use simple index notation (multiplication, division and brackets for most classes) | <ul style="list-style-type: none"> • All students should be able to estimate the size of any given angle • All students should be able to classify triangles and quadrilaterals according to their properties • All students should be able to use the fact that the interior angles of a triangle sum to 180° • All students should be able to use the fact that the interior angles of a quadrilateral sum to 360° • All students should be able to calculate volume via simple cube counting. • All students should be able to find the perimeter of a range of shapes. • All students should be able to find the area of rectangles, triangles, compound shapes and trapeziums. • All students should be able to find the volume of cubes and cuboids • All students should be able to appreciate when two shapes are congruent • All students should be able to use a ruler to draw a line to a specified length within 1mm • Most students should be able to draw angles to draw a specified angle to within 1° • Most students should be able to use a compass to draw a circle, given the radius • Most students should be able to complete basic bisections of lines and angles. • Most students should be able to enlarge shapes using a positive integer scale factor without a centre of enlargement. • Some students should be able to use the conditions for congruent triangles • Some students should be able to find algebraic perimeters and areas. | <p>the angles of similar shapes are the same</p> <ul style="list-style-type: none"> • Most students should be able to find algebraic perimeters and areas. • Most students should be able to find the volume of prisms and cylinders • Some students should be able to derive and use the conditions for congruent triangles • Some students should be able to enlarge shapes using a positive integer scale factor without a centre of enlargement. • All students should be able to use a calculator efficiently, particularly for squaring negative numbers, fractions and mixed numbers • All students should be able to find squares, cubes and roots and understand the relationship between them • All students should be able to identify and understand the importance of prime numbers • All students should be able to work with negative numbers using all four operations. • All students should be able to order negative numbers • All students should be able to work with factors and multiples • All students should be able to use BIDMAS. • All students should be able to tell the time, calculate with time and read from timetables. • All students should be able to change time to a decimal value • All students should be able to calculate speed and work with speed, distance and time graphs. • All students should be able to add and subtract fractions • All students should be able to multiply and divide fractions • All students should be able to recognise and name equivalent fractions • All students should be able to convert between mixed numbers and improper fractions |
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| | <ul style="list-style-type: none"> • All students should be able to use and understand the terms impossible, certain, evens, likely and unlikely • All students should be able to understand the probability scale for 0-1 • All students should be able to understand the relationship between relative frequency and theoretical probability • All students should be able to understand that different trials of an experiment may produce different outcomes • All students should be able to systematically list outcomes of an event • All students should be able to read from scales • All students should be able to find missing values on scales • All students should be able to draw and label a set of axes • All students should be able to construct and interpret tables (including tally tables and two way tables) • Most students should be able to construct and interpret bar charts, pictograms and line graphs. • Some students should be able to read and interpret pie charts • Some students should be able to understand the difference between types of data | <ul style="list-style-type: none"> • Some students should understand the relationships between angles in parallel lines. • All students should be able to use a calculator efficiently, particularly for squaring negative numbers, fractions and mixed numbers • All students should be able to find squares, cubes and roots • All students should be able to identify and understand the importance of prime numbers • All students should be able to be able to order negative numbers • All students should be able to work with factors and multiples • All students should be able to make simple estimates • All students should be able to understand and use brackets • All students should be able to use simple index notation • All students should be able to tell the time using an analogue clock • All students should be able to read from timetables • All students should be able to shade unit fractions and those such as $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$ of a shape • All students should be able to add and subtract fractions • All students should be able to multiply and divide fractions • All students should be able to simplify fractions • All students should be able to convert between fractions, decimals and percentages • Most students should be able to work with negative numbers using all four operations. • Most students should be able to calculate simple imperial to metric conversions | <ul style="list-style-type: none"> • All students should be able to convert between fractions and decimals • All students should be able to compare and order fractions and decimals • All students should be able to find a fraction of a quantity • Most students should be able to calculate HCF and LCM • Most students should be able to calculate simple imperial to metric conversions and should be able to use a conversion graph with accuracy • Some students should be able to add and subtract mixed numbers and improper fractions • Some students should be able to multiply and divide with mixed numbers and improper fractions • All students should be able to understand the difference between types of data • All students should be able to construct and interpret tables (including tally tables and two way tables) • All students should be able to construct and interpret bar charts, pictograms, line graphs and frequency polygons • All students should be able to read and interpret pie charts • All students should be able to draw pie charts from raw data • Some students should be able to construct and interpret simple histograms • All students should be able to understand the probability scale for 0-1 • All students should be able to understand and use the language associated with probability and to understand when to give fractional versus worded answers • All students should be able to understand the relationship between relative frequency and theoretical probability • All students should be able to understand that different trials of an experiment may produce different outcomes |
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| | | <ul style="list-style-type: none"> • Some students should be able to find HCF and LCM. • Some students should be able to work with improper fractions. • Some students should be able to change time to a decimal value • Some students should be able to calculate speed, distance and time and work with speed, distance, time graphs. • All students should be able to read from scales and find missing values on scales. • All students should be able to draw and label a set of axes • All students should be able to understand the difference between types of data • Most students should be able to construct and interpret tables (including tally tables and two way tables) • Most students should be able to construct and interpret bar charts, pictograms, line graphs and frequency polygons • Some students should be able to read and interpret pie charts • Some students should be able to draw pie charts from raw data • All students should be able to know that all the outcomes of an event must add to 1 • All students should be able to understand and use the language associated with probability and to understand when to give fractional versus worded answers • All students should be able to understand the relationship between relative frequency and theoretical probability • All students should be able to understand that different trials of an experiment may produce different outcomes | <ul style="list-style-type: none"> • All students should be able to systematically list outcomes of an event • All students should be able to construct and use a tree diagram to show all the outcomes of multiple events and their corresponding probabilities • Most students should be able to have an initial understanding of the and/or rule in probability. • Some students should be able to construct and use a tree diagram to show all the outcomes of multiple dependent events and their corresponding probabilities. |
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| | | <ul style="list-style-type: none"> All students should be able to systematically list outcomes of an event Some students should be able to construct a simple tree diagram. | |
| <u>8</u> | <ul style="list-style-type: none"> All students should be able to extend and find missing values in sequences using a term-to-term rule All students should be able to describe a term to term rule for a sequence. All students should be able to recognise and represent number patterns including finding an expression for the nth term of an arithmetic sequence All students should be able to simplify expressions and collect like terms. All students should be able to solve linear equations with one unknown All students should be able to be able to interpret inequality signs Most students should be able to use substitution. Most students should be able to use the formula for the area and circumference of a circle All students should be able to use number lines to make statements such as 7 is less than 10, 1 is more than -3 All students should be able to find volumes by counting cubes All students should be able to find the volume of cubes, cuboids and triangular prisms. All students should be able to name a variety of 2D and 3D shapes. All students should be able to calculate the area of rectangles, triangles and parallelograms. All students should be able to use a ruler to draw a line to a specified length within 1mm All students should be able to draw angles to draw a specified angle to within 1° | <ul style="list-style-type: none"> All students should be able to describe a term to term rule for a sequence. All students should be able to recognise and represent number patterns including finding an expression for the nth term of an arithmetic sequence All students should be able to explore simple non-linear sequences, including Fibonacci style sequences All students should be able to simplify expressions, collect like terms, expand and factorise linear expressions, up to and including double brackets. All students should be able to solve linear equations with one unknown, including the unknown on both sides of the equation and brackets All students should be able to interpret inequality signs All students should be able to represent and interpret inequalities on a number line All students should be able to form and solve a linear inequality Most students should be able to solve simple fractional equations that can be reduced to linear problems Most students should be able to formulate a linear equation with one unknown to solve problems Some students should be able to represent an equality graphically, identifying the accepted region All students should be able to draw lines of symmetry on shapes All students should be able to find the order of | <ul style="list-style-type: none"> All students should be able to recognise and represent number patterns including finding an expression for the nth term of an arithmetic sequence All students should be able to explore simple non-linear sequences, including Fibonacci style sequences All students should be able to simplify expressions, collect like terms, expand and factorise linear expressions, up to and including double brackets. All students should be able to solve linear equations with one unknown, including the unknown on both sides of the equation and brackets All students should be able to solve simple fractional equations that can be reduced to linear problems All students should be able to formulate a linear equation with one unknown to solve problems All students should be able to use of substitution in equations (to include use of negative numbers) All students should be able to interpret inequality signs All students should be able to represent and interpret inequalities on a number line All students should be able to factorise quadratic expressions Most students should be able to generate a sequence from a quadratic nth term Most students should be able to find the nth term of a quadratic sequence Most students should be able to recognise that different looking expressions may be identical and prove simple algebraic identities Most students should be able to change the subject of an equation |

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| <ul style="list-style-type: none"> • All students should be able to draw lines of symmetry on shapes • All students should be able to find the order of rotational symmetry of shapes • All students should be able to reflect a shape in a line, including on co-ordinate axes • Most students should be able to construct the locus of points equidistant from two fixed points • Most students should be able to construct the locus of points equidistant from two fixed lines • Some students should be able to construct accurate SAS triangles. • Some students should be able to construct accurate ASA triangles. • Some students should be able to rotate a shape about a centre, including on co-ordinate axes • Some students should be able to translate a shape by a given vector • Some students should be able to enlarge a shape by a positive scale factor. • All students should be able to add, subtract, multiply and divide. • All students should be able to represent and order positive and negative integers, fractions and decimals on a number line • All students should be able to use a calculator efficiently, particularly for squaring negative numbers, fractions and mixed numbers • All students should be able to understand the relationship between percentages, fractions and decimals • All students should be able to find percentages of quantities using a calculator. | <p>rotational symmetry of shapes</p> <ul style="list-style-type: none"> • All students should be able to find volumes by counting cubes • All students should be able to identify key parts of a circle, including the radius, diameter, circumference, tangent and chord • All students should be able to use the formula for the area and circumference of a circle • All students should be able to volume of a cylinder • All students should be able to construct regular polygons with circles • All students should be able to construct the locus of points equidistant from two fixed points • All students should be able to construct the locus of points equidistant from two fixed lines • All students should be able to construct triangles. • Most students should be able to reflect a shape in a line, including on co-ordinate axes • Most students should be able to rotate a shape about a centre, including on co-ordinate axes • Most students should be able to translate a shape by a given vector • Most students should be able to enlarge a shape by a positive scale factor from a centre of enlargement. • Most students should be able to find the volume of cubes and cuboids, prisms cylinders and composite solids • Some students should be able to find the area and perimeter of a semicircle and a quarter circle • Some students should be able to solve word problems involving circumference and area of a circle | <ul style="list-style-type: none"> • Most students should be able to form and solve a linear inequality • Most students should be able to represent an equality graphically, identifying the accepted region • Some students should be able to represent multiple inequalities graphically, identifying the accepted region • All students should be able to reflect a shape in a line, including on co-ordinate axes • All students should be able to rotate a shape about a centre, including on co-ordinate axes • All students should be able to translate a shape by a given vector • All students should be able to enlarge a shape by a positive scale factor from a centre of enlargement. • All students should be able to find the volume of cubes and cuboids, prisms cylinders and composite solids • All students should be able to identify key parts of a circle, including the radius, diameter, circumference, tangent and chord • All students should be able to use the formula for the area and circumference of a circle • Most students should be able to find the area and perimeter of a semicircle and a quarter circle • Most students should be able to explore the surface area of cubes, cuboids, cylinders, other prisms and composite solids • Most students should be able to identify and describe fully the type of transformation carried out by comparing an object and its image, including enlargement • Most students should be able to describe and transform 2D shapes using combined rotations, reflections, rotations or enlargements • Some students should be able to find the volume of pyramids and frustums |
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| | <ul style="list-style-type: none"> • All students should be able to add and subtract decimals. • All students should be able to multiply and divide decimals. • All students should be able to interpret a:b where a and b are integers • All students should be able to compare two or more quantities by ratio • All students should be able to write equivalent ratios and find a missing term in a pair of equivalent ratios • Most students should be able to express ratios in their simplest form • Most students should be able to divide a quantity in a given ratio • Some students should be able to be able to work with recipes, primarily scaling up by whole numbers but also with halves. • Some students should be able to be able to calculate the answer to best buy questions. • All students should be able to understand the probability scale for 0-1 • All students should be able to know that all the outcomes of an event must add to 1 • All students should be able to understand and use the language associated with probability • Most students should be able to basic probability trees with fractions and decimals. • Some students should be able to use the and/or rule to answer questions based on probability trees. • All students should be able to plot coordinates in all four quadrants • All students should be able to find the mean, median, mode and range from raw data | <ul style="list-style-type: none"> • All students should be able to use a calculator efficiently, particularly for squaring negative numbers, fractions and mixed numbers • All students should be able to understand the relationship between percentages, fractions and decimals • All students should be able to find percentages of quantities. • All students should be able to add and subtract decimals • All students should be able to estimate answers to calculations to check results are reasonable • Most students should be able to increase or decrease a quantity by a given percentage • Most students should be able to calculate percentage change • Most students should be able to multiply and divide decimals • All students should be able to find the mean, median, mode and range from raw data • All students should be able to find speed, distance and time using the formula. • All students should be able to interpret speed, distance and time graphs. • All students should be able to plot coordinates in all four quadrants • Most students should be able to identify the equations of horizontal and vertical lines • Most students should be able to plot coordinates from an equation to generate a straight line, linking to the nth term of a sequence • Most students should be able to find the midpoint of a line segment joining two points | <ul style="list-style-type: none"> • Some students should be able to convert between cm^3, m^3 and other units of volume • Some students should be able to find the area of sectors and the length of arcs • Some students should be able to solve loci problems • All students should be able to interpret a:b and a:b:c where a, b and c are integers • All students should be able to compare two or more quantities by ratio • All students should be able to understand the relationship between ratio, fractions and percentages • All students should be able to write equivalent ratios and find a missing term in a pair of equivalent ratios • All students should be able to express ratios in their simplest form • All students should be able to divide a quantity in a given ratio • Some students should be able to express ratios in their simplest form, including those involving decimals or fractions • All students should be able to represent and order positive and negative integers, fractions and decimals on a number line • All students should be able to apply the four basic operations to positive negative numbers, including fractions and decimals • All students should be able to use a calculator efficiently, particularly for squaring negative numbers, fractions and mixed numbers • Some students should be able to investigate the effect of indices on negative numbers • All students should be able to find percentages of quantities. • All students should be able to express one quantity as a percentage of another • All students should be able to use percentages that are more than 100% • All students should be able to increase or decrease a quantity by a given percentage |
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| | <ul style="list-style-type: none"> • Most students should be able to identify the equations of horizontal and vertical lines • Some students should be able to plot simple linear graphs | <ul style="list-style-type: none"> • Most students should be able to find the gradient of two points on a graph • Some students should be able to find the mean, median, mode and range from tables and graphical representations • All students should be able to write equivalent ratios and find a missing term in a pair of equivalent ratios • All students should be able to express ratios in their simplest form • Most students should be able to divide a quantity in a given ratio • All students should be able to sort objects into simple Venn diagrams. • All students should be able to sort number patterns into Venn diagrams, e.g. factors/multiples. • Most students should be able to draw basic probability trees with fractions and decimals. • Some students should be able to use the and/or rule to answer questions based on probability trees. | <ul style="list-style-type: none"> • All students should be able to understand how to compare quantities using percentages • All students should be able to calculate percentage change • Most students should be able to calculate reverse percentages. • All students should be able to use the four operations with decimals. • All students should be able to estimate answers to calculations to check results are reasonable • All students should be able to find the mean, median, mode and range from raw data • Most students should be able to find the mean, median, mode and range from tables and graphical representations • Some students should be able to estimate the mean from a grouped frequency table • All students should be able to sort number patterns into Venn diagrams, e.g. factors/multiples. • All students should be able to find the volume of a cylinder • All students should be able to construct accurate SAS triangles. • All students should be able to construct accurate ASA triangles. • All students should be able to construct accurate SSS triangles. • All students should be able to find speed, distance and time using the formula. • All students should be able to plot coordinates in all four quadrants • All students should be able to solve problems using a coordinate grid including those involving fractions • All students should be able to identify the equations of horizontal and vertical lines • All students should be able to plot coordinates from an equation to generate a straight line, linking to the nth term of a sequence |
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| | | | <ul style="list-style-type: none"> • All students should be able to find the midpoint of a line segment joining two points • All students should be able to find the gradient of two points on a graph • Some students should be able to find the endpoint of a line segment given the midpoint and the other end point • Some students should be able to find the equation of a straight line from the graph • Some students should be able to identify parallel lines from their equations • All students should be able to plot simple quadratic graphs • Some students should be able to find the equation of a straight line given the gradient and a point • Some students should be able to find the equation of a straight line given a parallel line and a point • Some students should be able to find the equation of a straight line given two points • Some students should be able to plot and recognise other nonlinear graphs e.g. cubic, reciprocal and exponential • Some students should be able to have a basic understanding of set notation – union/intersection • All students should be able to draw basic probability trees with fractions and decimals. • All students should be able to use the and/or rule to answer questions based on probability trees. • All students should be able to use the and/or rule to answer other probability questions. • Most students should be able to consider probability trees with three options. |
| <u>9</u> | <ul style="list-style-type: none"> • All students should be able to understand plans, elevations and isometric drawing • All students should be able to use scale drawings | <ul style="list-style-type: none"> • All students should be able to complete plans, elevations and isometric drawing • All students should be able to interpret maps and scale drawings | <ul style="list-style-type: none"> • All students should be able to place a set of positive numbers, including decimals in order • All students should be able to recognize basic powers eg $2 \times 2 = 2^2$ |

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| | <ul style="list-style-type: none"> • All students should be able to convert between metric units of measurement • All students should be able to make sensible estimates using diagrams of common real life objects. • All students should be able to recall compass points and their degree value. • All students should be able to know the names and properties of basic 2D and 3D shapes • All students should be able to identify edges, vertices and faces • All students should be able to recognise acute, right, obtuse and reflex angles • All students should be able to draw and measure acute and obtuse angles • All students should be able to estimate the size of any given angle • All students should be able to classify triangles and quadrilaterals according to their properties • All students should be able to know and use the fact that the interior angles of a triangle sum to 180° • All students should be able to know and use the fact that the interior angles of a quadrilateral sum to 360° • All students should be able to find the area of basic shapes • All students should be able to find the area of compound shapes made up of basic shapes • All students should be able to find the volume of triangular prisms • All students should be able to calculate simple missing angles in parallel lines. • All students should be able to rotate a shape a given amount of degrees • All students should be able to translate by a vector • All students should be able to reflect in a mirror line. Find a centre of rotation. | <ul style="list-style-type: none"> • All students should be able to calculate bearings and back bearings. • All students should be able to make sensible estimates using diagrams of common real life objects. • All students should be able to know the names and properties of basic 2D and 3D shapes • All students should be able to identify edges, vertices and faces • All students should be able to recognise acute, right, obtuse and reflex angles • All students should be able to draw and measure acute and obtuse angles • All students should be able to estimate the size of any given angle • All students should be able to classify triangles and quadrilaterals according to their properties • All students should be able to know and use the fact that the interior angles of a triangle sum to 180° • All students should be able to know and use the fact that the interior angles of a quadrilateral sum to 360° • All students should be able to recognise the nets of 3-D shapes such as pyramids and triangular prisms • All students should be able to find the area of basic shapes • All students should be able to find the area of compound shapes made up of basic shapes • All students should be able to find the area of trapeziums • All students should be able to find the volume of cubes and cuboids • Most students should be able to find the volume of triangular prisms • Most students should be able to draw a quadrilateral such as a kite, parallelogram or rhombus with given measurements | <ul style="list-style-type: none"> • All students should be able to know the meaning of a multiple of two numbers • All students should be able to know the definition of a prime number • All students should be able to know how to round to the nearest 10, 100 and 1000 • All students should be able to identify a common denominator that can be used to order a set of fractions • All students should be able to be able to round to any number of decimal places. • All students should be able to write prime factorisation in index form. • All students should be able to understand the laws of indices including reciprocals • All students should be able to simplifying surds. • All students should be able to write numbers to and from Standard form • All students should be able to complete calculations with standard form • All students should be able to order numbers involving standard form • All students should be able to expand brackets involving standard form • All students should be able to round to decimal and significant places. • All students should be able to use error interval notation. • All students should be able to estimate calculations. • All students should be able to use a calculator to perform a given calculation. • All students should be able to write down a maximum or minimum figure for a value rounded to a given degree of accuracy • All students should be able to calculate a fraction of an amount. • All students should be able to find percentages of amounts. • All students should be able to convert from mixed to improper fractions |
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| | <ul style="list-style-type: none"> • Most students should be able to identify the angle of rotation • Some students should be able to identify the equation of the line of reflection • Some students should be able to find the centre of enlargement • Some students should be able to calculate simple missing exterior angles in polygons. • Some students should be able to enlarge a shape by a given scale factor • Some students should be able to complete the 4 types of transformations on an axes. • Some students should be able to describe the 4 transformations • Some students should be able to find the area of trapeziums • Some students should be able to interpret maps and scale drawings with links to bearings • All students should be able to perform the 4 operations with positive numbers accurately. • All students should be able to recognize basic powers eg $2 \times 2 = 2^2$ • All students should be able to know the meaning of a multiple of two numbers • All students should be able to know the definition of a prime number • All students should be able to write prime factorisation in index form. • All students should be able to write numbers to and from standard form • All students should be able to order numbers involving standard form • All students should be able to round to decimal places • All students should be able to round to significant figures | <ul style="list-style-type: none"> • Most students should be able to calculate interior and exterior angles of polygons. • Most students should be able to calculate simple missing angles in parallel lines. • Most students should be able to complete the 4 types of transformations on an axes. • Some students should be able to construct perpendicular bisectors and angle bisectors • Some students should be able to use terminology such as alternate angles, corresponding angles and supplementary angles when giving descriptions. • Some students should be able to describe the 4 transformations • Some students should be able to find the volume of cylinders • All students should be able to place a set of positive numbers, including decimals in order • All students should be able to recognize basic powers eg $2 \times 2 = 2^2$ • All students should be able to know the meaning of a multiple of two numbers • All students should be able to know the definition of a prime number • All students should be able to know how to round to the nearest 10, 100 and 1000 • All students should be able to round to any number of decimal places. • All students should be able to use a scientific calculator to calculate powers and roots • All students should be able to write prime factorisation in index form. • All students should be able to round including to decimal places and significant figures. | <ul style="list-style-type: none"> • All students should be able to complete fraction operations involving all four operations. This must include mixed numbers. • All students should be able to complete decimal operations involving all four operations. • All students should be able to calculate percentage change • All students should be able to calculate simple interest • Most students should be able to convert recurring decimals to fractions • Most students should be able to understand reciprocals. • Most students should be able to calculate compound interest • Most students should be able to combine upper and lower bounds to find a maximum or minimum • Most students should be able to multiply brackets with surds. • Most students should be able to complete calculations involving Surds. • Most students should be able to work with fractional and negative indices. • Most students should be able to use prime factorisation to calculate HCF and LCM (cheese slices problem) • Some students should be able to rationalise the denominator • students should be able to interpret maps and scale drawings • All students should be able to calculate bearings and back bearings. • All students should be able to know the names and properties of basic 2D and 3D shapes • All students should be able to identify edges, vertices and faces • All students should be able to recognise acute, right, obtuse and reflex angles • All students should be able to draw and measure acute and obtuse angles • All students should be able to estimate the size of any given angle |
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| | <ul style="list-style-type: none"> • All students should be able to estimate calculations. • All students should be able to use a calculator to perform a given calculation. • All students should be able to shade a fraction of an amount. • All students should be able to calculate percentages of amounts with a calculator. • All students should be able to simplify fractions • All students should be able to complete fraction operations involving all four operations. • All students should be able to complete decimal operations involving all four operations. • All students should be able to answer simple interest questions. • Most students should be able to identify a common denominator that can be used to order a set of fractions • Most students should be able to know the meaning of 'highest common factor' and 'lowest common multiple' • Most students should be able to calculate percentage change. • Some students should be able to answer compound interest questions • Some students should be able to complete calculations with standard form • All students should be able to simplify ratios • All students should be able to use a ratio to share an amount • All students should be able to answer direct proportion problems, including missing values from a table. • Most students should be able to use a unitary method for proportion, | <ul style="list-style-type: none"> • All students should be able to estimate calculations. • All students should be able to simplify fractions • All students should be able to calculate a fraction of an amount. • All students should be able to find percentages of amounts. • All students should be able to convert from mixed to improper fractions • All students should be able to fraction operations involving all four operations. This does not necessarily include with mixed numbers. • All students should be able to use decimal operations involving all four operations. • All students should be able to calculate percentage change • All students should be able to calculate simple interest • Most students should be able to identify a common denominator that can be used to order a set of fractions • Some students should be able to know the meaning of 'highest common factor' and 'lowest common multiple' • All students should be able to simplify ratios • All students should be able to interpret maps and scale drawings • All students should be able to write a ratio in the form 1:n • Most students should be able to use a ratio to share an amount • Most students should be able to use ratio for best buys • Some students may be able to use direct and indirect proportion. • All students should be able to design a 2-way table and | <ul style="list-style-type: none"> • All students should be able to classify triangles and quadrilaterals according to their properties • All students should be able to know and use the fact that the interior angles of a triangle sum to 180° • All students should be able to know and use the fact that the interior angles of a quadrilateral sum to 360° • All students should be able to calculate interior and exterior angles of polygons. • All students should be able to calculate simple missing angles in parallel lines. • All students should be able to use terminology such as alternate angles, corresponding angles and supplementary angles when giving descriptions. • All students should be able to work with similar and congruent shapes. • All students should be able to enlarge a shape by a given scale factor • All students should be able to rotate a shape a given amount of degrees • All students should be able to translate by a vector • All students should be able to reflect in a mirror line. • All students should be able to describe the 4 transformations • All students should be able to find the area of basic shapes • All students should be able to find the area of compound shapes made up of basic shapes • All students should be able to find the volume of cubes and cuboids • All students should be able to construct and recognise the nets of 3-D shapes such as pyramids and triangular prisms • All students should be able to construct perpendicular bisectors and angle bisectors • All students should be able to construct the perpendicular from a point to a line |
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| | <p>including looking at best buys and recipe questions.</p> <ul style="list-style-type: none"> All students should be able to complete simple two way tables All students should be able to design a 2-way table and answer probability questions. (given that...) All students should be able to complete simple frequency trees All students should be able to write probabilities as fractions from simple events All students should be able to estimate future outcomes by using relative frequency and theoretical probability. All students should be able to calculate missing probabilities based on mutually exclusive events sum to 1. All students should be able to understand reliability and the more tests the more reliable. All students should be able to complete probabilities for tree diagrams. All students should be able to use probability and Venn diagrams Most students should be able to fill in a Venn diagram Most students should be able to use “and” and “or” rules for probability with tree diagrams. All students should be able to draw and interpret bar charts. All students should be able to draw and interpret pictograms. Most students should be able to draw and interpret scatter graphs. | <p>answer probability questions.</p> <ul style="list-style-type: none"> All students should be able to write probabilities as fractions from simple events All students should be able to understand relative frequency and theoretical probability. All students should be able to calculate missing probabilities based on mutually exclusive events sum to 1. All students should be able to list outcomes. All students should be able to fill in a Venn diagram Most students should be able to complete a frequency tree and use it to compare results Most students should be able to complete probabilities for tree diagrams. Some students should be able to use “and” and “or” rules for probability with tree diagrams. Some students should be able to identify correct regions from a Venn diagram given probability notation. All students should be able to draw and interpret bar charts. All students should be able to draw and interpret pictograms. All students should be able to draw and interpret scatter graphs. All students should be able to interpret pie charts. Most students should be able to draw pie charts. | <ul style="list-style-type: none"> All students should be able to construct the perpendicular from a point on a line All students should be able to construct and interpret plans and elevations of 3-D shapes Most students should be able to find the area of trapeziums Most students should be able to enlarge with fractional and negative scale factors Some students should be able to use parallel lines to create equations with unknowns on both sides. Some students should be able to find the volume of more complex 3D shapes All students should be able to simplify ratios All students should be able to draw scale diagrams All students should be able to write a ratio in the form 1:n All students should be able to use a ratio to share an amount All students should be able to use a ratio to make comparisons of quantities All students should be able to use ratio for best buys All students should be able to work with direct proportion, including missing values from a table. All students should be able to use a unitary method for proportion. Most students should be able to convert between metric units of measurement including volume and area. Most students should be able to interpret maps and scale drawings Some students should be able to compare ratios and equations e.g b is $\frac{2}{3}$ of c and $4a=5c$ Some students should be able to work with inverse proportion, including missing values from a table. All students should be able to design a 2-way table and answer probability questions. All students should be able to write probabilities as fractions from simple events |
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| | | | <ul style="list-style-type: none"> • All students should be able to understand relative frequency and theoretical probability. • All students should be able to complete a frequency tree and use it to compare results • All students should be able to estimate future outcomes by using relative frequency and theoretical probability. • All students should be able to understand independent and dependant events • All students should be able to calculate missing probabilities based on mutually exclusive events sum to 1. • All students should be able to understand reliability and the more tests the more reliable. • All students should be able to complete probabilities for tree diagrams. • All students should be able to use “and” and “or” rules for probability with tree diagrams. • Most students should be able to use probability notation eg $P(A')$, $P(A \cap B)$ • All students should be able to use probability and Venn diagrams • Most students should be able to identify correct regions from a Venn diagram given probability notation. • All students should be able to complete a frequency tree • All students should be able to understand multiplication and addition rules for probability (without the need for a tree diagram) • Some students should be able to use Venn diagrams and probability where equations must be constructed. • Some students should be able to use a Venn diagram for calculating conditional probability. • All students should be able to draw and interpret bar charts. • All students should be able to draw and interpret pictograms. • All students should be able to draw and interpret scatter graphs. • All students should be able to draw and interpret pie charts. |
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| | | | <ul style="list-style-type: none"> • Most students should be able to draw and interpret cumulative frequency. • Most students should be able to draw and interpret box plots. |
| <u>10</u> | <ul style="list-style-type: none"> • All students should be able to estimate sizes of angles; • All students should be able to measure angles using a protractor; • All students should be able to understand clockwise and anticlockwise; • All students should be able to name angles and distinguish between acute, obtuse, reflex and right angles; • All students should be able to identify a line perpendicular to a given line; • All students should be able to identify parallel lines; • All students should be able to recognise reflection symmetry of 2D shapes; • All students should be able to identify and draw lines of symmetry on a shape; • All students should be able to recognise rotation symmetry of 2D shapes; • All students should be able to identify the order of rotational symmetry of a 2D shape; • All students should be able to draw or complete diagrams with a given number of lines of symmetry; • All students should be able to draw or complete diagrams with a given order of rotational symmetry. • All students should be able to distinguish between scalene, equilateral, isosceles and right-angled triangles; | <ul style="list-style-type: none"> • All students should be able to apply the four operations including formal written methods to integers, decimals and simple fractions (proper and improper) and mixed numbers – all both positive and negative • All students should be able to calculate exactly with fractions • All students should be able to define percentage as ‘number of parts per hundred’ • All students should be able to interpret percentages and percentage changes as a fraction or a decimal and interpret these multiplicatively • All students should be able to compare two quantities using percentages • All students should be able to work with percentages greater than 100% • All students should be able to solve problems involving percentage change, including percentage increase/decrease and original value problems and simple interest including financial mathematics • All students should be able to work out a percentage of a given quantity • All students should be able to calculate simple interest • All students should be able to work out a percentage change. • All students should be able to find the perimeter of a | <ul style="list-style-type: none"> • All students should be able to calculate the mean for a frequency distribution • All students should be able to find the modal class for grouped data • All students should be able to estimate the mean for grouped data • All students should be able to estimate the median class for grouped data • All students should be able to find the upper and lower quartiles and calculate the interquartile range for a frequency distribution • All students should be able to understand how different sample sizes may affect the reliability of conclusions drawn; • All students should be able to identify possible sources of bias and plan to minimise it; • All students should be able to select and justify a sampling scheme and a method to investigate a population, including random and stratified sampling; • All students should be able to construct and interpret cumulative frequency tables; • All students should be able to construct and interpret cumulative frequency graphs/diagrams and from the graph: • All students should be able to find the median and quartile values and interquartile range; • All students should be able to compare the mean and range of two distributions, or median and interquartile range, as appropriate; |

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| | <ul style="list-style-type: none"> • All students should be able to find a missing angle in a triangle, using the angle sum of a triangle is 180°; • All students should be able to mark parallel lines on a diagram; • All students should be able to classify quadrilaterals by their geometric properties; • All students should be able to use the fact that angle sum of a quadrilateral is 360°; • All students should be able to recognise and name pentagons, hexagons, heptagons, octagons and decagons; • All students should be able to recall and use properties of angles at a point, angles at a point on a straight line, right angles, and vertically opposite angles; • All students should be able to recognise basic sequences, including Fibonacci sequences • All students should be able to use function machines to generate input/output terms • All students should be able to find the nth term of a linear sequence • All students should be able to plot and draw lines such as $y = x$, $y = -x$, $x = 4$, $y = -2$ • All students should be able to find the perimeter of a shape by counting sides of squares • All students should be able to find the area of a shape by counting squares • All students should be able to find the volume of a shape by counting cubes • All students should be able to find the volume of a | <p>shape by counting sides of squares</p> <ul style="list-style-type: none"> • All students should be able to find the area of a shape by counting squares • All students should be able to find the volume of a shape by counting cubes • All students should be able to name the parts of a circle • All students should be able to find the volume of a solid by counting cubes and stating units • All students should be able to work out the area and perimeter of a rectangle • All students should be able to find the volume of a cuboid • All students should be able to find the area of a triangle and parallelogram • All students should be able to calculate the circumference and area of a circle • All students should be able to find the volume of prisms including cylinders • Some students should be able to work out the perimeter and area of compound shapes made from parts of a circle • All students should be able to understand place value in large numbers <ul style="list-style-type: none"> • All students should be able to understand simple instances of BIDMAS • All students should be able to round to the nearest integer • All students should be able to round whole numbers to the nearest 10, 100, 1000, ... • All students should be able to multiply and divide whole numbers by 10, 100, 1000, ... • All students should be able to add and subtract negative numbers • All students should be able to use inverse operations to check answers | <ul style="list-style-type: none"> • All students should be able to interpret box plots to find median, quartiles, range and interquartile range and draw conclusions; • All students should be able to produce box plots from raw data and when given quartiles, median and identify any outliers; • All students should be able to know the appropriate uses of histograms; • All students should be able to construct and interpret histograms from class intervals with unequal width; • Most students should be able to use and understand frequency density; • Most students should be able to define and conduct a stratified sample. • Some students should be able to estimate the median from a histogram with unequal class widths or any other information from a histogram, such as the number of people in a given interval. • All students should be able to draw tree diagrams • All students should be able to understand and use probability notation such as $P(A)$ means probability of event A, $P(A')$ means probability of event not A • All students should be able to solve problems given a Venn Diagram • All students should be able to use tree diagrams to find probabilities of successive independent and dependent events (distinguish between such events) • All students should be able to draw tree diagrams and use them to find probabilities of successive dependent events |
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| | <p>solid by counting cubes and stating units</p> <ul style="list-style-type: none"> • All students should be able to work out the area and perimeter of a simple rectangle, such as 5m by 4m • All students should be able to find the volume of a cuboid • All students should be able to find the area of a triangle and parallelogram • Some students should be able to calculate the circumference and area of a circle • All students should be able to read values from conversion graphs • All students should be able to draw a line of symmetry on a 2-D shape • All students should be able to draw the reflection of a shape about a mirror line • All students should be able to draw all the lines of symmetry on a 2-D shape • All students should be able to name, draw or complete 2-D shapes from information about their symmetry • All students should be able to state the scale factor of an enlargement • All students should be able to translate a shape using a description such as 4 units right and 3 units down or from a vector • All students should be able to enlarge a shape by a positive scale factor from a given centre • All students should be able to rotate shapes about any point • All students should be able to recognise the net of a simple solid | <ul style="list-style-type: none"> • All students should be able to add and subtract positive and negative numbers • All students should be able to round numbers to given powers of 10 and up to 3 decimal places • All students should be able to multiply and divide negative numbers • All students should be able to round a number to one significant figure • All students should be able to multiply and divide whole numbers by a given multiple of 10 • Most students should be able to find the area and perimeter of compound shapes • Most students should be able to interpret percentage problems using a multiplier • Most students should be able to express one quantity as a fraction of another where the fraction is less than 1 or greater than 1 • Most students should be able to work interchangeably with terminating decimals and their corresponding fractions (including ordering) • Most students should be able to express one quantity as a fraction of another • Most students should be able to find the height of a cuboid, given the volume, length and breadth • Most students should be able to find the area of a kite and trapezium • Most students should be able to work out the perimeter and area of a semi-circle | <ul style="list-style-type: none"> • All students should be able to understand conditional probability • All students should be able to use a tree diagram to show outcomes for calculating conditional probability • Most students should be able to shade areas on Venn diagrams • Some students should be able to use a Venn diagram for calculating conditional probability • All students should be able to convert fractions to decimals to percentages • All students should be able to recognise that recurring decimals are exact fractions and that some exact fractions are recurring decimals • All students should be able to convert recurring decimals to fractions • All students should be able to work out a percentage increase or decrease • All students should be able to interpret percentage problems using a multiplier • All students should be able to work out reverse percentage problems • All students should be able to understand how to use successive percentages • All students should be able to work out compound interest • All students should be able to recognise the upper and lower bounds of rounded numbers (nearest integer) • All students should be able to calculate the upper and lower bounds (involving addition or subtraction) • All students should be able to explain what is meant by rational and irrational numbers • All students should be able to explain what a surd is |
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| | <ul style="list-style-type: none"> • All students should be able to draw scale drawings • All students should be able to draw a triangle given three sides, or two sides and the included angle, or two angles and a side • All students should be able to use map scales to find a distance • Most students should be able to give the order of rotational symmetry of a 2-D shape • Most students should be able to understand congruence and similarity • Most students should be able to find the area and perimeter of compound shapes • Most students should be able to name the parts of a circle • Most students should be able to plot and draw straight lines in the form $y = mx + c$ • Some students should be able to interpret plans and elevations of 3-D shapes • Some students can construct perpendicular bisectors and angle bisectors • Some students can draw and measure bearings. • Some students should be able to find missing angles using properties of corresponding and alternate angles; • All students should be able to apply the four operations including formal written methods to integers, decimals and simple fractions (proper and improper) and mixed numbers – all both positive and negative | <ul style="list-style-type: none"> • All students should be able to use ratio notation, including reduction to its simplest form and its various links to fraction notation • All students should be able to understand the meaning of ratio as a fraction • All students should be able to divide a quantity in a given ratio • Most students should be able to write a ratio in the form $1 : n$ or $n : 1$ • Most students should be able to solve ratio and proportion problems using the unitary method • Most students should be able to solve Best Buy and Recipe problems using informal strategies or using the unitary method of solution • All students should be able to understand and use the vocabulary of probability • All students should be able to understand and use a probability scale • All students should be able to express a probability as a fraction • All students should be able to display outcomes systematically • All students should be able to understand the differences between experimental and theoretical probability • All students should be able to use a two-way table to find a probability • All students should be able to understand mutually exclusive events • All students should be able to identify different mutually exclusive events and know, if they cover all | <ul style="list-style-type: none"> • All students should be able to simplify surds e.g. $\sqrt{12} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$ • All students should be able to understand the rules of adding, subtracting, multiplying, and dividing with surds – (links to basic algebra rules) • All students should be able to expand a single bracket with surds • Most students should be able to expand double brackets with surds • Most students should be able to rationalise the denominator - recognise $(\sqrt{3} - 2)$ as the multiplier to rationalise • Most students should be able to model growth and decay problems mathematically • Some students should be able to solve growth and decay problems using multipliers or iterative processes • Some students should be able to use formal algebraic proofs to convert recurring decimals to fractions • All students should be able to solve more complex ratio and proportion problems, such as sharing out a quantity in a given ratio • All students should be able to write a ratio in the form $1 : n$ or $n : 1$ • All students should be able to solve ratio and proportion problems using the unitary method • All students should be able to solve Best Buy problems using informal strategies or using the unitary method of solution • All students should be able to calculate proportional changes using a multiplier • Most students should be able to understand that an equation of the form $y=kx$ represents |
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| | <ul style="list-style-type: none"> • All students should be able to work out a percentage of a given quantity • All students should be able to calculate simple interest • All students should be able to make sensible estimates of lengths • All students should be able to understand simple instances of BIDMAS, such as $12 \times 5 - 24 \div 8$ • All students should be able to round to the nearest integer • All students should be able to round whole numbers to the nearest 10, 100, 1000, ... • All students should be able to multiply and divide whole numbers by 10, 100, 1000, ... • All students should be able to add and subtract negative numbers • All students should be able to multiply and divide negative numbers • Most students should be able to work out a percentage change. • Some students should be able to work with percentages greater than 100% • Some students should be able to convert between metric and imperial units such as speed, for example, convert 70 km/h to mph • All students should be able to understand the meaning of ratio as a fraction • All students should be able to divide a quantity in a given ratio • Most students should be able to solve simple ratio and proportion problems, such as finding the ratio of one quantity to another • Most students should be able to write a ratio in the form 1 : n or n : 1 | <p>possibilities, then the sum of their probabilities is 1</p> <ul style="list-style-type: none"> • All students should be able to use probability to estimate outcomes for a population. • All students should be able to understand and use relative frequency • All students should be able to find the mode for a set of numbers • All students should be able to find the median for an odd set of numbers • All students should be able to work out the range for a set of numbers • All students should be able to calculate the mean for a set of numbers • All students should be able to find the median for an even set of numbers • All students should be able to write down the mode from a graph • All students should be able to be able to draw pie charts from a table. • Most students should be able to calculate the 'fx' column for a frequency distribution • Most students should be able to find the modal class for grouped data • Most students should be able to estimate the mean for grouped data • Some students should be able to estimate the median class for grouped data • Some students should be able to be able to work with algebra in pie charts. | <p>direct proportion and that k is the constant of proportionality</p> <ul style="list-style-type: none"> • Some students should be able to understand that an equation of the form $y = k/x$ represents inverse proportion and that k is the constant of proportionality • students should be able to draw and complete a table of values to find coordinates • All students should be able to draw, scale and label suitable axes • All students should be able to plot and draw straight lines in the form $y = mx + c$ • All students should be able to plot and draw straight lines in the form $ax + by = c$ • All students should be able to find solutions to a linear equation from a graph • All students should be able to plot and draw lines such as $y = x$, $y = -x$, $x = 4$, $y = -2$ • All students should be able to identify the gradient and intercept from an equation in form $y = mx + c$ • All students should be able to identify parallel lines from their equations • All students should be able to find the equation of a straight line from a graph • All students should be able to find the gradient of a perpendicular line • All students should be able to find the equation of a perpendicular line • All students should be able to work out the perimeter and area of a semi-circle • Some students should be able to convert between cube units such as changing $3.7m^3$ to cm^3 • All students should be able to find the volume of prisms including cylinders • All students should be able to solve problems involving |
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| | <ul style="list-style-type: none"> • Most students should be able to solve ratio and proportion problems using the unitary method • Most students should be able to solve Best Buy problems using informal strategies or using the unitary method of solution • All students should be able to understand and use the vocabulary of probability • All students should be able to understand and use a probability scale • All students should be able to express a probability as a fraction • All students should be able to display outcomes systematically • All students should be able to understand the differences between experimental and theoretical probability • All students should be able to use a two-way table to find a probability • All students should be able to find the mode for a set of numbers • All students should be able to find the median for an odd set of numbers • All students should be able to work out the range for a set of numbers • All students should be able to calculate the mean for a set of numbers • All students should be able to find the median for an even set of numbers • All students should be able to write down the mode from a graph • Most students should be able to be able to draw pie charts from a table. | | <p>surface areas of prisms and cylinders</p> <ul style="list-style-type: none"> • All students should be able to work out the perimeter and area of compound shapes made from parts of a circle • All students should be able to find the average speed in km/h from a distance–time graph over time in minutes • All students should be able to discuss and interpret graphs modelling real situations • All students should be able to interpret a gradient as the rate of change • Some students should be able to draw a tangent at a point on a curve to find the gradient • students should be able to reflect shapes in lines such as $y = x$ and $y = 2x$ • All students should be able to rotate shapes about any point • All students should be able to describe fully reflections in any line parallel to the axes, $y = x$ or $y = -x$ and rotations about any point • All students should be able to find the centre of a rotation and describe it fully • All students should be able to find the ratio of corresponding lengths in similar shapes and identify this as the scale factor of enlargement • All students should be able to use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations • All students should be able to describe a combination of transformations as a single transformation • All students should be able to use map scales to find a distance |
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| | | | <ul style="list-style-type: none"> • All students should be able to interpret plans and elevations of 3-D shapes • All students should be able to construct perpendicular bisectors and angle bisectors • All students should be able to construct the perpendicular from a point to a line • All students should be able to construct the perpendicular from a point on a line • All students should be able to construct the locus of points equidistant from two fixed points • All students should be able to construct and interpret plans and elevations of 3-D shapes • All students should be able to draw/measure bearings based on acute angles. • All students should be able to draw/measure bearings based on obtuse angles. • All students should be able to use two angles to map the position of point 'C' from A and B. • All students should be able to use angles and measures to mark the position of point 'B' from A. • All students should be able to draw a quadratic curve • Some students should be able to estimate roots and turning points from a quadratic graph • Most students should be able to find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function • Most students should be able to sketch a graph of a quadratic function by factorising/ using the formula – identifying roots, y intercept and turning point • Most students should be able to complete the square • Most students should be able to interpret graphs of simple cubic functions, including |
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| | | | <p>finding solutions to cubic equations</p> <ul style="list-style-type: none"> • Most students should be able to calculate the lengths of arcs of circles • Most students should be able to calculate the areas of sectors of circles • Some students should be able to solve problems involving surface areas and volumes of pyramids, cones and spheres • Most students should be able to carry out more advanced interpretation of real-life graphs, such as finding simple average speed from distance–time graphs and recognising when the fastest average speed takes place • Most students should be able to interpret velocity-time graphs • Some students should be able to enlarge a shape by a fractional scale factor • Some students should be able to understand the effect of enlargement on perimeter • Some students should be able to enlarge a shape by a negative scale factor • Some students should be able to draw graphs of the reciprocal function with $x \neq 0$ using tables of values <p>Some students should be able to draw circles, centre the origin, equation $x^2 + y^2 = r^2$</p> <ul style="list-style-type: none"> • students should be able to match one angle and one side of congruent triangles given some dimensions • All students should be able to match sides and angles of similar triangles • All students should be able to find a missing length in two similar shapes • All students should be able to prove two triangles are congruent |
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| | | | <ul style="list-style-type: none"> • All students should be able to find the area of a 2-D shape, given the area of a similar shape and the ratio • All students should be able to solve problems such as the angles of a triangle are $x + 3$, $2x$ and $x + 70$, find the value of x • All students should be able to show an equality such as $-4 < x \leq 2$ on a number line • All students should be able to solve an equality such as $2x - 7 \leq 3$ and represent the solution set on a number line • All students should be able to find the integer solutions of an inequality such as $-8 < 2n \leq 5$ • All students should be able to represent linear inequalities in two variables, such as $x + y < 7$, as a region on a graph • All students should be able to solve a set of linear inequalities in two variables and represent the solution as a region of a graph or using set notation • All students should be able to understand and use a solution set of discrete values written in the form $\{-2, -1, 0, 1, 2\}$ • All students should be able to know and apply $\text{Area} = ab \sin C$ to calculate the area, sides or angles of any triangle. • Some students should be able to use the sine and cosine rules to solve 3D problems. • All students should be able to understand, recall and use trigonometric relationships and Pythagoras' Theorem in right-angled triangles, and use these to solve problems in 3D configurations. • All students should be able to factorise quadratic expressions in the form $ax^2 + bx + c$; • All students should be able to solve quadratic equations by factorisation and completing the square; |
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| | | | <ul style="list-style-type: none"> • All students should be able to solve quadratic equations that need rearranging; • All students should be able to set up and solve quadratic equations; • All students should be able to find the exact solutions of two simultaneous equations in two unknowns; • All students should be able to interpret the solution in the context of the problem; • All students should be able to find the equation of the line through two given points. • All students should be able to substitute negative numbers into a simple formula such as $F = 1.8C + 32$ • All students should be able to substitute numbers into more complicated formulae involving brackets and fractions • All students should be able to distinguish between an expression, an equation and a formula • All students should be able to rearrange linear formulae such as $p = 3q + 5$ • All students should be able to change the subject of a simple formula, i.e. linear one-step, such as $x = 4y$; • All students should be able to understand and use vector notation • All students should be able to calculate the resultant of two vectors • All students should be able to understand and use the commutative and associative properties of vector addition • All students should be able to solve simple geometrical problems in 2d using vector methods • All students should be able to apply vector methods for simple geometric proofs |
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| | | | <ul style="list-style-type: none"> • Most students should be able to change the subject of a formula, including cases where the subject is on both sides of the original formula, or involving fractions and small powers of the subject; • Most students should be able to solve exactly, by elimination of an unknown, two simultaneous equations in two unknowns • Most students should be able to solve simple quadratic equations by using the quadratic formula; • Most students should be able to know the sine and cosine rules, and use to solve 2D problems (including involving bearings). • Some students should be able to use elimination or substitution to solve simultaneous equations; • Some students should be able to find the volume of a 3-D solid, given the volume of a similar solid and the ratio • Some students should be able to set up and solve an equation such as $4x + 5 = 3(x + 4)$ or $\frac{x}{2} - \frac{x}{8} = 9$ or $\frac{2x-7}{4} = 1$ • Some students should be able to prove construction theorems • Some students should be able to derive more complex formulae • Some students should be able to set up and solve a pair of simultaneous equations in two variables for each of the above scenarios, including to represent a situation; |
| 11 | <ul style="list-style-type: none"> • All students should be able to factorise a bracket with one unknown on the | <ul style="list-style-type: none"> • All students should be able to factorise a bracket with one unknown on the | <ul style="list-style-type: none"> • students should to generate terms of a sequence from a position-to-term rule and find |

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| | <p>outside using both positive and negative numbers.</p> <ul style="list-style-type: none"> • All students should be able to expand double brackets using positive numbers. • Most students should be able to expand double brackets using negative numbers. • All students should be able to factorise into a double bracket using positive numbers. • Some students should be able to factorise into a double brackets using negative numbers. • All students should be able to solve equations with one unknown. • Most students should be able to solve equations with two unknowns. • All students should be able to recall and use angle facts including angles on a straight line; a quadrilateral; around a point and in a triangle. • All students should be able to identify a selection of polygons. • Most students should be able to find exterior angles of polygons. • Some students should be able to use exterior angles of polygons to find interior angles of polygons. • All students should be able to identify angles in parallel lines using corresponding, supplementary and alternate angles. • Some students should be able to name all of the parts of a circle. • Most students should be able to find the area and circumference of a circle. • All students should be able to calculate simple area and perimeter. • All students should be able to calculate simple volume. • Some students should be able to find the area of a triangle and parallelogram. | <p>outside using both positive and negative numbers.</p> <ul style="list-style-type: none"> • All students should be able to expand double brackets using positive numbers. • Most students should be able to expand double brackets using negative numbers. • All students should be able to factorise into a double bracket using positive numbers. • Most students should be able to factorise into a double brackets using negative numbers. • All students should be able to solve equations with one unknown. • Most students should be able to solve equations with two unknowns. • Most students should be able to derive algebraic equations, e.g. from area or perimeter problems. • Most students should be able to solve equations involving brackets, e.g. $4(x + 2) = 2(x - 1)$. • Some students should be able to answer questions involving simultaneous equations. • All students should be able to recall and use angle facts including angles on a straight line; a quadrilateral; around a point and in a triangle. • Most students should be able to derive simple angle rules. • All students should understand triangle properties and be able to use such properties to find missing angles, e.g. by using isosceles triangles. • All students should be able to identify a selection of polygons. • Most students should be able to find exterior angles of polygons. • Some students should be able to use exterior angles of polygons to find interior angles of polygons. | <p>the nth term of a linear sequence</p> <ul style="list-style-type: none"> • All students should to use function machines in a simplistic way • All students should to use algebra within function machines • All students should to be able to calculate with simple growth, such as simple interest rates • All students should to be able to calculate with compound growth, such as compound interest rates • All students should To simplify and manipulate algebraic fractions • All students should be able to form and solve algebraic expressions to solve problems • All students should be able to solve linear simultaneous equations • All students should understand that an even number is represented by $2n$ • All students should understand that $2n+1$ represents an odd number • All students should be able to sketch cubic graphs • All students should be able to work fluently to calculate reciprocals of numbers and plot functions involving reciprocals • All students should be able to identify hyperbolas and match them to their equations • All students should be able to plot and sketch graphs from given functions • All students should be able to recognise linear, quadratic and reciprocal graphs • Most students should to generate terms of a sequence using a function • Most students should to use and find composite and inverse functions • Most students should to find the nth term of a quadratic sequence • Most students should be able to calculate with compound decay, such as depreciation |
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| <ul style="list-style-type: none"> • Some students should be able to find compound areas. • Most students should be able to use map scales to find a distance. • Most students should be able to interpret plans and elevations of 3-D shapes • All students should understand the idea of a locus • Some students should be able to construct perpendicular bisectors and angle bisectors • Some students should be able to construct the perpendicular from a point to a line • Some students should be able to construct the perpendicular from a point on a line • Some students should be able to construct the locus of points equidistant from two fixed points • All students should be able to answer two digit by two digit multiplication questions. • All students should be able to calculate division with and without remainders. • Most students should be able to answer functional skills questions to include reading electricity meters, paying water bills etc. • Most students should be able to apply the four operations including formal written methods to decimals and fractions. • Most students should be able to find a fraction of an amount • Some students should be able to work interchangeably with terminating decimals and | <ul style="list-style-type: none"> • All students should be able to identify angles in parallel lines using corresponding, supplementary and alternate angles. • All students should be able to name all of the parts of a circle. • All students should be able to find the area and circumference of a circle. • Most students should be able to find partial or compound areas/perimeters. • Some students should be able to find area of sectors or lengths of arcs. • All students should be able to calculate simple area and perimeter. • All students should be able to calculate simple volume. • All students should be able to find the area of a triangle and parallelogram. • Most students should be able to find compound areas. • Some students should be able to find the area of a kite and trapezium. • Most students should be able to use map scales to find a distance. • Most students should be able to interpret plans and elevations of 3-D shapes • All students should understand the idea of a locus • All students should be able to construct perpendicular bisectors and angle bisectors • Most students should be able to construct the perpendicular from a point to a line • Most students should be able to construct the perpendicular from a point on a line | <ul style="list-style-type: none"> • Most students should To complete the square on a quadratic expression • Most students should be able to solve quadratic simultaneous equations • Most students should be able to use identities including equating coefficients • Most students should be able algebraic expressions to support an argument or verify a statement • Most students should be able to derive simple algebraic proofs using reasoning (students should be familiar with the term consecutive) • Most students should be able to identify and plot exponential graphs • Some students should be able to identify and plot trigonometric graphs • Some students should be able to represent a circle given its centre on the origin and radius r by a function • Some students should know the exact ratios given by sine and cosine of 0, 30, 45, 60 and 90 degrees and the exact ratios given by the tangent function for 0, 30, 45 and 60 degrees • Some students will be able to use the sine, cosine and sine area rules to solve problems relating to unknown sides, angles and areas in non-right-angled triangles. • Some students will be able to identify when the trigonometric ratios must be used instead of Pythagoras' theorem to solve 2D problems relating to right-angled triangles, including contextual problems • Some students will be able to identify and plot trigonometric graphs • All students will be able to represent vectors as a diagram or column • All students will be able to apply add and subtract vectors • All students will be able to multiply vectors by a scalar |
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| | <p>their corresponding fractions (including ordering)</p> <ul style="list-style-type: none"> • All students should be able to find percentages of amounts • Some students should be able to calculate percentage change • Some students should be able to calculate simple interest • All students should be able to identify factors and multiples • All students should be able to identify and understand prime numbers and what makes a prime • All students should know all of the square numbers up to 12×12; all of the square roots; all of the cube numbers up to $5 \times 5 \times 5$ and all of the cube roots. • Some students should be able to find the HCF and the LCM. • All students should understand the meaning of ratio as a fraction • All students should be able to divide a quantity in a given ratio • Some students should be able to write a ratio in the form $1 : n$ or $n : 1$ • Some students should be able to solve ratio and proportion problems using the unitary method • Most students should be able to solve Best Buy problems using informal strategies or using the unitary method of solution • All students should understand when to describe a probability using words and when to use fractions. • All students should be able to mark a probability on a number line. | <ul style="list-style-type: none"> • Most students should be able to construct the locus of points equidistant from two fixed points • Some students should be able to use Pythagoras' Theorem to answer questions involving right angle triangles. • All students should be able to answer two digit by two digit multiplication questions. • All students should be able to calculate division with and without remainders. • Most students should be able to answer functional skills questions to include reading electricity meters, paying water bills etc. • All students should be able to apply the four operations including formal written methods to decimals and fractions. • All students should be able to find a fraction of an amount • Most students should be able to work interchangeably with terminating decimals and their corresponding fractions (including ordering) • All students should be able to find percentages of amounts • Most students should be able to calculate percentage change • All students should be able to calculate simple interest • Most students should be able to answer compound interest questions. • Most students should be able to attempt questions involving reverse percentages. | <ul style="list-style-type: none"> • All students will know what it means for two objects to be congruent • All students will know the conditions for which congruence for a pair of triangle is then implied: • All students will be able to sketch vertical translations of quadratic functions • All students will be able to sketch horizontal translations of quadratic functions • All students will know and use the formula for calculating the area of a circle and adapt this formula to find the area of a sector given the angle formed at the centre between the radii using fractions of the whole • Most students will be able to sketch translations and reflections of cubic, reciprocal and exponential functions • Most students will be able to find the volume and surface area of a pyramid • Some students will be able to sketch quadratic functions that have been translated in both the horizontal and vertical directions • Some students will know the effect translations have on the axis of symmetry and vertex of a quadratic • Some students will be able to calculate the volume and surface area of a cone • Some students will be able to calculate the volume and surface area of a sphere and a cone • Some students will be able to calculate the volume and surface area of composite 3D shapes • Some students know the features of a quadratic function: axis of symmetry, roots and vertex, and identify these features from the sketch of a quadratic • Some students will be able to calculate using circle theorems. • All students should be able to share in multiple parts including decimals |
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| | <ul style="list-style-type: none"> • All students should be able to complete probability tables. • All students should be able to list probability 'outcomes'. • Most students should be able to complete two way tables. • Some students should be able to complete frequency trees. • Most students should be able to complete and draw sample spaces. • Some students be able to work with basic probability trees. | <ul style="list-style-type: none"> • All students should be able to identify factors and multiples • All students should be able to identify and understand prime numbers and what makes a prime • All students should know all of the square numbers up to 12×12; all of the square roots; all of the cube numbers up to $5 \times 5 \times 5$ and all of the cube roots. • Some students should be able to find the HCF and the LCM. • All students should understand the meaning of ratio as a fraction • All students should be able to divide a quantity in a given ratio • Most students should be able to write a ratio in the form $1 : n$ or $n : 1$ • Some students should be able to solve ratio and proportion problems using the unitary method • Most students should be able to solve Best Buy problems using informal strategies or using the unitary method of solution • Most students should be able to answer recipe questions. • All students should understand when to describe a probability using words and when to use fractions. • All students should be able to mark a probability on a number line. • All students should be able to complete probability tables. • All students should be able to list probability 'outcomes'. • Most students should be able to complete two way tables. | <ul style="list-style-type: none"> • All students should be able to write a ratio in the form $1 : n$ or $n : 1$ • All students should be able to solve ratio and proportion problems using the unitary method • All students should be able to solve Best Buy problems using informal strategies or using the unitary method of solution • Most students should be able to use direct proportion to solve problems • Most students should be able to use the unitary method to solve proportion problems • Most students should be able to solve direct proportion questions graphically • Most students should be able to solve inverse proportion questions, based on $y = 1/x$ • Some students should be able to solve direct proportion questions using algebraic manipulation • Some students should be able to solve direct proportion problems involving the square or square root of a variable |
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| | | <ul style="list-style-type: none"> • All students should be able to complete frequency trees. • Most students should be able to complete and draw sample spaces. • All students be able to work with basic probability trees. • All students should be able to complete basic Venn diagram questions. • Some students should be able to answer more complex Venn diagram questions, including those with problems around the union or algebraic properties. | |
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GO FURTHER: Skills Builder

We are also explicitly embedding transferable ‘Skills Builder’ skills such as problem solving, aiming high and teamwork to prepare our students for HAP education and employability skills for the future. We will continue to focus on PROBLEM SOLVING by applying basic techniques in an applied process integrated with other processes in different contexts. Furthermore, we want our students to STAY POSITIVE and be able to regulate their emotions, analyse their solutions, and work through set backs

How does our Curriculum cater for students with SEND?

Sandhill View is an inclusive academy where every child is valued and respected. We are committed to the inclusion, progress and independence of all our students, including those with SEN. We work to support our students to make progress in their learning, their emotional and social development and their independence. We actively work to support the learning and needs of all members of our community.

A child or young person has SEN if they have a learning difficulty or disability which calls for special educational provision to be made that is additional to or different from that made generally for other children or young people of the same age. (CoP 2015, p16)

Teachers are responsible for the progress of ALL students in their class and high-quality teaching is carefully planned; this is the first step in supporting students who may have SEND. All students are challenged to do their very best and all students at the Academy are expected to make at least good progress.

In mathematics our schemes of work caters for our SEND students, this does not just mean the LAP scheme as our SEND students are spread across all abilities and so this has been taken into account when creating resources for example. We believe that to motivate and inspire our low attaining learners we Mathematics curriculum policy 24-25 The department where everybody counts

need to customise their learning. We recognise many of these students will access the MAP tier of entry at GCSE and to minimise demotivation have removed some HAP grade topics altogether. We have also offered opportunities to maximise their success by giving them more time to master the basics than other classes might have.

We recognise and value ongoing research in this area and hope to promote mathematics resilience in our lower ability learners by dispelling some of the negative experiences they have had in the past and promoting positivity and a 'can do' attitude. We hope to do this by focusing on the three key areas identified by Wilder and Lee (2013):

- A belief that studying maths is worth it (value)
- A growth mind set (belief)
- A recognition that learning is challenging but it is worth it (effort)

Specific approaches which are used within all of our mathematics lessons (including within LAP, MAP and HAP schemes of learning) include:

- Seating to allow inclusion
- Differentiation activities to stretch and support in all lessons
- Resources are accessible yet challenging
- Displays and visual learning tools are used where necessary
- Where appropriate support from additional adults is planned to scaffold students learning
- Group work and discussion
- Clear teacher/student communication
- Feedback that allows students to make progress, whether written or verbal
- Independent study/homework.
- Intervention when required

How does our curriculum cater for disadvantaged students and those from minority groups?

As a school serving an area with high levels of deprivation, we work tirelessly to raise the attainment for all students and to close any gaps that exist due to social contexts. The deliberate allocation of funding and resources has ensured that attainment gaps are closing in our drive to ensure that all pupils are equally successful when they leave the Academy. More specifically within the teaching of mathematics, we;

- Work to identify barriers, interests and what might help each pupil make the next steps in learning using lead practitioner research and actions to support.
- Provide targeted support for under-performing pupils during lesson time, such as targeted questioning, live marking and seating, in addition to revision lessons and intervention outside school hours.
- Analyse class data and assess where gaps arise between pp and non-pp to provide targeted support during lesson time, in addition to revision lessons outside of school.
- Use strategies best suited to addressing individual needs, rather than just fitting pupils into their existing support strategies
- Ensure there are opportunities for students to make use of resources and gain homework support outside of lesson time through the use of Teams
- Provide students with revision materials to reduce financial burden on families

How do we make sure that our curriculum is implemented effectively?

The mathematics department is responsible for designing the mathematics curriculum and the Curriculum leader is responsible for monitoring its implementation. The leader also has the support of a number of staff to do this including the Headteacher (a mathematics specialist); the Assistant Headteacher; one Lead Practitioner and the Second in Department.

The curriculum leader ensures staff have access to professional development and training to ensure the curriculum requirements are met. This training includes wider pedagogical training delivered through whole school CPD but also training on areas more specific to department priorities. External guests have come and delivered, the further maths support project have been an ever-present including mastery and further maths sessions. This CPD may include areas such as subject knowledge development to support our recently qualified and non-specialist teachers. At times maths specific CPD will also take place across the trust, in order to enhance teaching and further pupil progress. Staff within the department are also encouraged to participate in and have delivered particular CPD in areas they specialise in or are particularly strong in. Across the MAT we have staff who mark for a range of exam boards at a number of levels, and so are able to provide vital CPD to the rest of the department to ensure reliability of data. In 2023-24 the timetable has allowed the department to meet once a fortnight for vital departmental CPD.

Assessments are designed thoughtfully to assess student progress and also to shape future learning. In house end of topic tests are after each topic in all years 7-10. Effective assessment informs staff about areas in which interventions are required. These interventions are delivered during curriculum time to enhance pupils' capacity to access the full curriculum. Assessments are checked for reliability within departments and across the Trust. Gap analysis spreadsheets are used to identify areas of development for students and the maths department. Gap analysis is used by the curriculum leader to assess changes which may need to be made within the curriculum.

Curriculum resources are selected carefully and reviewed regularly. Designing shared resources as a department allows for career development opportunities for staff and ensures staff are in touch with the sequence of learning and lessons. Shared resources are made by all, each member of the department is responsible for a year group and so must provide a holistic set of resources for each topic allowing class teachers to edit appropriately for their classes.

As part of this staff are regularly asked to give feedback on the curriculum and our Lead Practitioner keeps up to date with the most recent research and makes changes to our schemes of work as appropriate, in consultation with the curriculum leader. The curriculum leader's monitoring is validated by senior leaders.

Numeracy

We also recognise that for the mathematics curriculum to be successful numeracy should be a valued part of the wider school community. As such the mathematics department works closely with other departments to ensure the curriculum supports the needs of other subject areas and the learning of our students. To do this we regularly review our curriculum and audit departments to ensure content is delivered in the correct sequence and make changes when it is not. A calculation policy to ensure consistency in the teaching of method across all subjects in the MAT.

How do we make sure our curriculum is having the desired impact?

We regularly review our curriculum and consider our schemes of work to be live documents which can always be improved. We triangulate using the following methods to ensure our curriculum is having the desired impact:

- Examination results analysis and evaluation
- Termly assessments based upon prior learning for retrieval-analysis and evaluation meetings
- Lesson observations
- Learning walks for KS3 and KS4 based upon departmental priorities
- Work sample for each year group cross referenced against milestone assessment end points
- Regular feedback from teaching staff during department meetings
- Regular feedback from Middle Leaders during curriculum meetings
- Pupil Surveys
- Parental feedback