IDSALL SCHOOL

Maths Curriculum

Our Vision for Maths:

Mathematics is a creative discipline with a rich history of exploring and solving intriguing problems; it provides a foundation for understanding the world and is instrumental in ground-breaking work which drives global innovations.

- Through our mathematics curriculum, our vision is to harness each student's love and enjoyment of the subject by allowing them frequent opportunities to develop their understanding and succeed. We aim to develop learners who enjoy mathematics and are curious about the subject and its applications. Our students will be fluent in the fundamentals of mathematics and develop sophisticated problem-solving skills which allow them to explore challenging questions with confidence.
- We will develop student's ability to think logically and accurately.
- We enable students to be able to confidently solve problems in unfamiliar contexts and demonstrate their ability to communicate ideas fluently.
- Students will be provided with skills that will not only help them succeed in mathematics but also in other subjects as well as outside the classroom.
- Opportunities for self-reflection are embedded in all key stages, enabling our students to take increasing ownership of their learning and ultimately creating independent learners who are well-equipped for the next phase of their education.

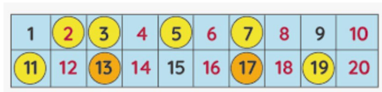
Y7

Summer

Assessment point

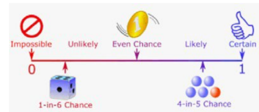
Prime numbers & proof

What to expect:
Identify Factors and Multiples, Investigate Special Numbers, Identify Highest Common Factor and Lowest Common Multiple, using Prime Numbers, Investigate Conjectures and Proofs.



Sets & probability

What to expect:
Represent Sets, Identify Intersections and Unions, Probability Introduction, Calculating Probabilities.



May Half term

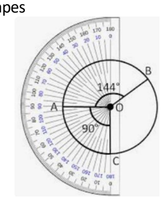
Developing number sense

What to expect:
Make Connections With Integers,
Make Connections with Fractions and Decimals, Estimating Solutions, Using Known Facts

Constructing, measuring & using geometric notation

Easter

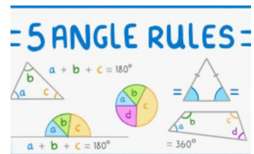
What to expect:
Geometric Notation, Working with Angles, Constructing Shapes with Specialist Equipment, Forming Pie Charts



Assessment point

Developing geometric reasoning

What to expect: Understand
Understand Angle Properties of Points, Lines, Triangles and Quadrilaterals, Identify Angle Properties of Straight Lines and Polygons, Investigate Geometric Proof.

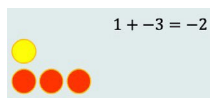


Addition & subtraction of fractions

What to expect:
Converting Fractions, Adding and Subtracting Unit, Non-Unit and Improper Fractions, Evaluating Fractions with Algebraic Terms.

Four operations with directed number

What to expect: Understand Directed Number, Adding, Subtracting, Multiplying and Dividing Directed Number, Substitution with Directed Number, Two-Step Equations, Order of Operations, Evaluating Powers and Roots.



Feb Half term

Fraction & percentages of amounts

What to expect:
Calculating Fractions of Amounts, Calculating Percentages of Amounts, Calculating Percentages Greater than 100%

Increase 60 by 20%
100% = 60
20% = 12
60 + 12 = 72

Solving problems with addition & subtraction

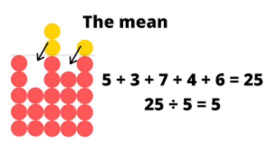
Xmas

What to expect:
Linking Addition and Subtraction, Mental and Written Methods for Addition and Subtraction, Adding and Subtracting with Standard Form

Assessment point

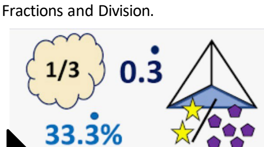
Solving problems with multiplication & division

What to expect:
Linking Multiplication and Division, Multiplying with Powers of 10, Written Methods for Multiplication and Division, Using the Mean, Order of Operations.



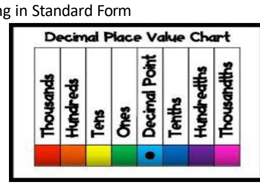
Fraction, decimal & percentage equivalence

What to expect:
Comparing Tenths and Hundredths, Converting Fractions and Decimals, Using Percentages, Understanding Pie Charts, Understanding Fractions Below and Greater Than 1, Linking Fractions and Division.



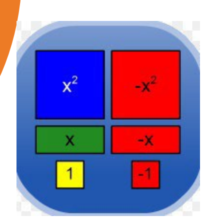
Place value & ordering integers & decimals

What to expect:
Reading, Writing and Comparing Integers, Using Ordered Lists, Rounding to Powers of 10, Understanding Decimals, Rounding to Significant Figures, Writing in Standard Form



Oct Half term

Equality and Equivalence

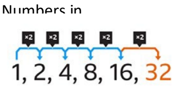


What to expect:
Using the Equal and Equivalence Symbol, One-Step Linear Equations, Understand Like and Unlike Terms, Collecting Like Terms

September

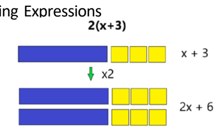
Sequences

What to expect:
Sequences – Shapes, Linear Sequences, Non-Linear Sequences, Representing Sequences, Missing Numbers in Sequences



Understand and Use Algebraic Notation

What to expect:
One and Two-Step Function Machines, Calculating Inputs and Outputs,
Using Expressions, Decoding Expressions



YEAR 7 CURRICULUM OVERVIEW - MATHS

The Big Picture - Intent:

Y7 Mathematics is an exciting transition point for students. Students develop their learning from primary using a 'mastery' approach alongside traditional methods to aid deeper understanding, competence and confidence in their mathematics.
Each term is split into 2 parts with a common theme, then split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills. Number work is emphasised throughout the blocks alongside estimation. Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials presented.
All students will be able to access the main content of all lessons and all students will be taught to the top with scaffolding, adaptive teaching and stretch and challenge provided where necessary.

Implementation:
There will be 7 blocks of approx. 6 weeks each. Each lesson will involve a retrieval starter usually a Mathsbox WR skills task or a WR flashback 4.
Independence and study skills will be fostered through challenging questions and problems, modelling, deep thinking and homework. All students will receive a PLC after each end of unit and termly assessment.
Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question.
Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.
A knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
Students will be given opportunities for awe and wonder where they are able to break down a barrier they had previously and encounter wow moments about the things they are learning.
Numeracy and calculator skills will be embedded throughout the curriculum.

Key Summative Assessments:

One formal assessment every term which comprises of 2 papers.

Shorter end of unit assessments after each unit.

DFM and Mathwatch Retrieval homework.

Live marking and low stakes quizzing

Autumn Term Assessments

Algebraic Thinking
Place Value and Proportion

Spring Term Assessments

Applications of Number
Directed Number
Fractional thinking

Summer term Assessments

Lines and Angles
Reasoning with number

Impact:
Students will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems.
Students will know more and remember more.
There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Year 7 Curriculum Overview

Autumn Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Algebra			Ratio and Proportions	
Unit: Sequences What a sequence is. What the difference between a linear and non linear sequence is. Some of the ways sequences can be represented.	**Unit: Understand and use algebraic notation** What a function machine is and how is helps us order our calculations. What an inverse operation is. Algebraic manipulation is just a generalisation of numerical manipulation.	**Equality and equivalence** That an equation shows two things which are equal. That equivalent things can look different but have the same value. Fact families give you all the related calculations to one other calculation.	**Unit: Place value ordering integers and decimals** Understand the value of digits in decimals, measure and integers. Round 1356.67 to the nearest 10/100/1000/1 dp. What are the essential criteria for a number in standard form?	**Unit: Fraction, decimal and percentage equivalence** A percentage is a decimal out of 100. Convert 40% into a decimal and a fraction being able to explain why and how they are connected. How can we use a bar model to show something is equivalent in the three forms?

Spring Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Solving Problems with addition and subtraction What structures underpin the various addition and subtraction strategies? What is the same about them and what is different? Why are these aspects different?	**Unit: Solving Problems with multiplication and division** What structures underpin the various multiplication and division strategies? What is the same about them and what is different? Why are these aspects different?	**Unit: Fractions and percentages of amounts** What is the original amount worth as a percentage or fraction? How can a bar model help you to find a fraction of an amount? What percentages are easier to find without a calculator?	**Unit: Operations and equations with directed number** How is +3 bigger than -8? What is a zero pair and why are they helpful? How do double sided counters help with subtracting a negative?	**Unit Fractional Thinking** Why can't fractions with different denominators be added together? What does an improper fraction always tell us about its size?

Summer Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Constructing measuring and using geometric notation. How angles can be described using 3 letters. What different marking on a diagram mean. When using a protractor how do we know whether to use the inside or outside numbers? What are the key properties of standard shapes.	**Unit: Developing geometric reasoning** Why is a complete turn 360° How do the angles in a triangle link to the angles on a straight line. How does the sum of the angles in a quadrilateral link to the angles in a triangle? What parallel means and looks like.	**Unit: Developing number sense.** How fact families can be used to create other related calculations. Know a range of strategies to perform the 4 main operations. How to estimate the answer to calculations by rounding each part.	**Unit: Sets and Probability** All probabilities lie between 0 and 1. Know the words associated with key probabilities. Use fractions to represent probabilities where the numerator is the number of successful events and the denominator is the total trials. A sample space diagrams is a way of setting out your outcomes to make them easier to interpret and calculate from.	**Unit: Prime Numbers and Proof** What prime, square and triangular numbers are (AND why they link to the shapes mentioned in their names). Prime factorisation is a way of finding the unique product of primes for any number. What LCM and HCF are and mean as this will support better completion of the process to find them.

Y8

Summer

Assessment point

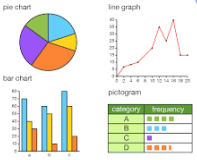
Measures of location

What to expect:
Using Averages, Averages from Tables (H), Comparing Data

Number of marks	Frequency	Mid-point	Frequency × Mid-point
0 - 9	3	$\frac{0+9}{2} = 4.5$	$3 \times 4.5 = 13.5$
10 - 19	7	$\frac{10+19}{2} = 14.5$	$7 \times 14.5 = 101.5$
20 - 29	9	$\frac{20+29}{2} = 24.5$	$9 \times 24.5 = 220.5$
30 - 39	6	$\frac{30+39}{2} = 34.5$	$6 \times 34.5 = 207$
	n = 25		Total = 542.5

The data handling cycle

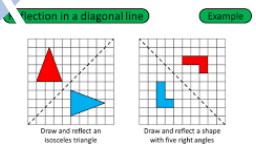
What to expect:
Collecting Data, Lines and Charts, Comparing Data



May Half term

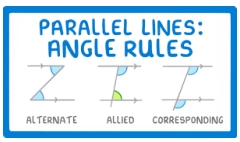
Line symmetry & reflection

What to expect:
Line Symmetry of Shapes, Reflecting in Horizontal, Vertical and Diagonal Lines.



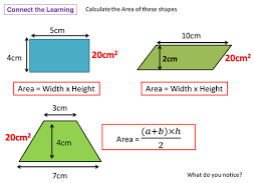
Angles in parallel lines & polygons

What to expect:
Investigating Parallel Lines, Angles in Quadrilaterals, Exterior and Interior Angles of Polygons, Geometric Proof, Constructing Bisectors (H)



Area of trapezia & circles

What to expect:
Area of Triangles, Quadrilaterals, Circles and Compound Shapes



Easter

Assessment point

Number sense

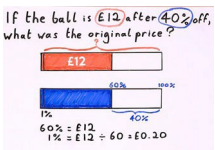
What to expect:
Rounding, Estimating and Calculating, Decimal Places, Calculating in Context, Units of Area and Volume (H)

Standard index form

What to expect:
Large Number and Decimals Written in Standard Form, Mental and Written Methods to Calculate with Standard Form, Negative and Fractional Powers (H)

Fractions & percentages

What to expect:
Using Multipliers, Expressing as a Percentage, Reverse Percentages (H)



Feb Half term

Indices

What to expect:
Understand Indices, Multiplying and Dividing Expressions using Indices, Powers of Powers (H)

$9^5 \div 9^2 = 9^3$

$4^6 \div 4^4 = 4^2$

$3^5 \div 3^{-7} = 3^{12}$

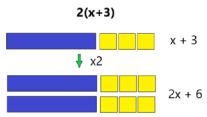
What do you notice?

Xmas

Assessment point

Brackets, equations & Inequalities

What to expect:
Forming and Using Expressions, Using Brackets, Brackets and Equations, Understand Inequalities, Unknowns on Both Sides (H)

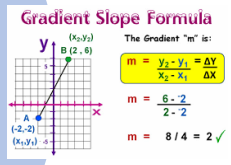


Sequences

What to expect:
Linear and Non-Linear Sequences. Using Expressions to Generate Sequences.

Working in the Cartesian plane

What to expect:
Plotting Points and Lines, Drawing Lines in the Form y=kx, y= x + a and y = mx + c, Lines With a Negative Gradient, Non-Linear Graphs (H), Midpoint of a Line Segment (H)



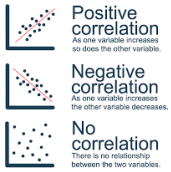
Oct Half term

Tables & probability

What to expect:
Sample Spaces and Probability, Using Diagrams to Find Probabilities.

Representing Data

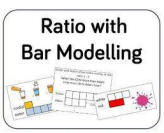
What to expect:
Understand and Draw Scatter graphs, Identify Types of Data, Grouping Data, Draw and Interpret Two-Way Tables



September

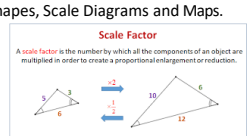
Ratio & Scale

What to expect:
Representing Ratios, Solving Ratio Problems, Dividing into a Ratio, Simplifying Ratios, Ratios in Circles and Graphs



Multiplicative change

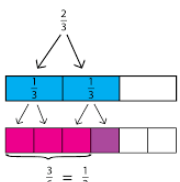
What to expect:
Direct Proportion, Conversions, Similar Shapes, Scale Diagrams and Maps.



Multiplying & dividing fractions

What to expect:
Multiplying and Dividing Fractions by Integers and Fractions, Calculating with Complex Fractions (H)

$\frac{3}{4} \times \frac{2}{3} = \frac{3}{4}$ group of $\frac{2}{3}$



YEAR 8 CURRICULUM OVERVIEW - MATHS

The Big Picture - Intent:
During Y8, students revisit prior topics within new contexts as well as further developing their mathematical thinking and skills. They will develop their learning using a 'mastery' approach alongside traditional methods to aid deeper understanding, competence and confidence. Learning blocks to be covered: Proportional Reasoning, Representations, Algebraic techniques, Developing number, Developing geometry and Reasoning with data.
Each term is split into two halves with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills.
Number work is emphasised throughout the blocks alongside estimation. Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials presented.
All students will be able to access the main content of all lessons and all students will be taught to the top with scaffolding, adaptive teaching and stretch and challenge provided where necessary.

Implementation:
There will be 6 blocks of approx. 6 weeks each. Each lesson will involve a retrieval starter usually a Mathsbox WR skills task or a WR flashback 4.
Independence and study skills will be fostered through challenging questions and problems, modelling, deep thinking and homework. All students will receive a PLC after each end of unit and termly assessment.
Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question.
Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.
A knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
Students will be given opportunities for awe and wonder where they are able to break down a barrier they had previously and encounter wow moments about the things they are learning.
Numeracy and calculator skills will be embedded.

Key Summative Assessments:

One formal assessment every term which comprises of 2 papers.

Shorter end of unit assessments after each unit.

DFM and Mathwatch Retrieval homework.

Live marking and low stakes quizzing

Autumn Term Assessments

Proportional Reasoning
Representations

Spring Term Assessments

Algebraic Techniques
Developing Number

Summer term Assessments

Lines and Angles
Reasoning with number

Impact:
Students will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Year 8 Curriculum Overview

Autumn Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Ratio and scale What is a ratio? How do you link ratios and fractions? Where and how are ratios found.	**Unit: Multiplicative change** Comparison and conversion using similarity and scale	**Unit: Multiply and divide fractions** What a fraction is. Ways in which fractions can be represented. Be able to identify reciprocals	**Unit: Working in the cartesian Plane** Understand the meaning of gradient and intercept. Link direct proportion to straight line graphs. Plot graphs from y=kx, y=mx + c	**Unit: Representing data** Understand what data is and the forms it can take. Some of the ways in which data can be represented. What a primary and secondary data source is

Spring Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Tables and Probability Know how to use probability and Venn notation. Use prior knowledge to solve multi-step problems or work backwards to find missing information. Sample space diagrams. Probability from two-way tables. Probability from Venn Diagrams. Applying the product rule.	**Unit: Brackets, equations and inequalities** Form and use algebraic expressions Manipulation of expressions and equations What an inequality is. How inequalities, equations, formulae and expressions differ.	**Unit: Sequences** What is a sequence. What is the difference between a linear and non linear sequence is. Some of the ways sequences can be represented.	**Unit: Indices** What an index is and how are they simplified. Explain powers of powers Addition/subtraction with indices Multiply/divide expressions with indices. Simplify algebraic expressions by multiplying and dividing indices.	**Unit: Fractions and percentages** How to apply conversion between FDP recognise a percentage as a part of a whole if that whole were divided into 100 equal parts Calculate a percentage of an amount Increase/decrease an amount by a given percentage Find the original value before a percentage change

Summer Term					
Golden Threads:Number, algebra, Ratio and proportions, Geometry and Measures, Probability and Statistics					
Unit: Standard index form Why we use standard form and the format that it takes. Write numbers in standard form Understand that negative indices in standard form may or may not refer to negative numbers	**Unit: Number sense** Why is rounding sometimes ok and sometimes not? How do you use estimation to check calculations When is a number significant Applying the correct units for context Calculating area and volume Converting units in area and volume	**Unit: Angles in parallel lines and polygons** Find missing angles explaining what rules you used. Identifying the properties of special quadrilaterals Calculate angles for parallel lines and transversals. Work out Interior/ exterior angles in polygons. construct angle and line bisectors.	**Unit: Area of Trapezia and circles** Find the area of trapeziums, circles and parts of circles. Recognise that there is a constant multiplicative relationship (Pi) between the diameter and the circumference of a circle. Derive and use the formula for the area of a circle.	**Unit: Line symmetry and reflction** Understand that while the position of a shape changes following a reflection, the shape itself does not change. What changes and what is invariant. Recognising line symmetry. Draw and translate simple shapes on a co-ordinate plane, reflect them in axes or given lines such as y=x, y=2, x=-3	**Unit: The data handling cycle** Understand that a hypothesis is an idea, expressed as a statement, that you want to investigate to establish whether it is true or not. Misleading graphs Describing the differences between data types Explaining and justifying the choice of data representation method

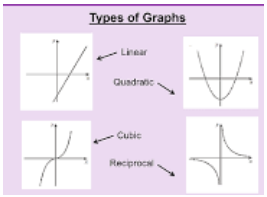
Y9

Summer

Assessment point

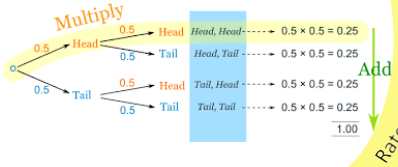
Solving problems using graphs, tables and algebra

What to expect:
Quadratic Functions on Graphs, Reciprocal Graphs, Exponential Graphs.



Probability

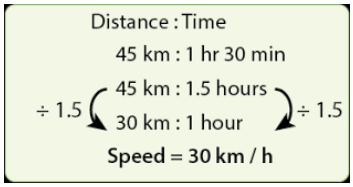
What to expect:
Probability Scale, Sample Space Diagrams, Venn Diagrams, Tree Diagrams



May Half term

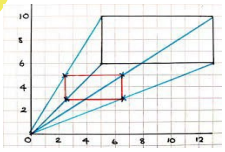
Rates

What to expect:
Compound Units, Metric Unit Conversions



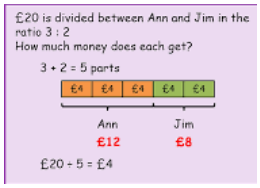
Enlargement & similarity

What to expect:
Enlargement With and Without Coordinate Grids. Angle Rules in Congruent Shapes.



Solving ratio & proportion problems

What to expect:
Divide into a Ratio, Express Values in a Ratio, Direct and Inverse Proportion, Compound Units

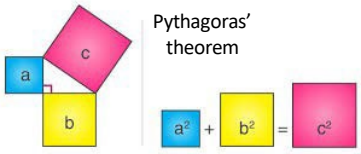


Easter

Assessment point

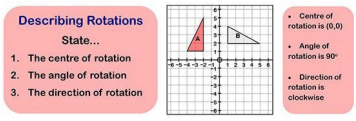
Pythagoras' theorem

What to expect:
Calculating Lengths of Right Angles Triangles, Pythagoras in Context.



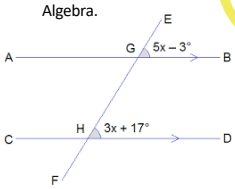
Rotation & Translation

What to expect:
Symmetry, Rotation, Translations.



Deduction

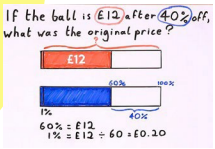
What to expect:
Chains of Reasoning with Angles, Geometric Conjectures, Angles and Algebra.



Feb Half term

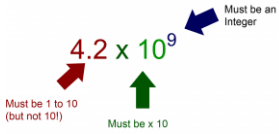
Maths & money

What to expect:
Percentages, Reverse Percentages, Wages and Tax Brackets. Repeated Percentage Change



Numbers

What to expect:
Real and irrational numbers, decimals, HCF and LCM, Standard form. .



Using Percentages

What to expect:
Estimating, Error Intervals, Fractions, Standard Form, Reciprocals

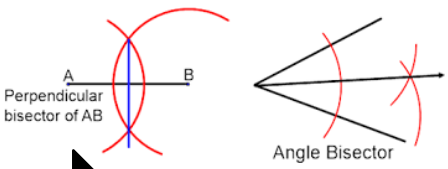
Fraction	Reciprocal
9/7	7/9
1/2	2 when the denominator = 1, it is omitted.
a/b	b/a

Xmas

Assessment point

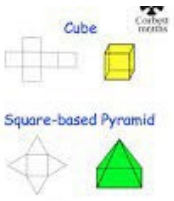
Constructions & congruency

What to expect:
Intro into Loci, Creating Perpendiculars, Rules of Congruence.



Three dimensional shapes

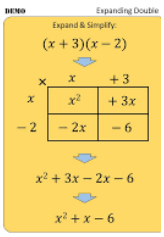
What to expect:
Understand 3-Dimensions, Nets and Diagrams, Surface Area, Volume of Prisms.



Oct Half term

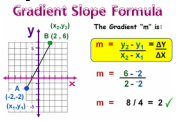
Testing conjectures

What to expect:
Properties of Number, Proofs, Expanding Brackets, Expanding Double Brackets



September

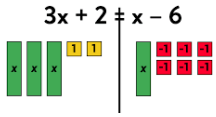
Straight line graphs



What to expect:
Lines Parallel to the axes, Identify Gradient and Intercepts, Link Knowledge of Equations and Lines

Forming & solving equations

What to expect:
Solving Equations and Inequalities, Inequalities with Negative Numbers, Inequalities and Equations with Unknowns on Both Sides, Rearranging Formulae



YEAR 9 CURRICULUM OVERVIEW - MATHS

The Big Picture - Intent:
Y9 Mathematics continues to revisit topics within new contexts whilst extending and further developing mathematical thinking and skills. There is an increased focus on students' rationale and thinking behind the maths that they are doing. Students develop their learning from previous years using a 'mastery' approach alongside traditional methods to aid deeper understanding, competence and confidence.
Learning Programme blocks to be covered: Reasoning with algebra, Constructing in 2 and 3 dimensions, Reasoning with number, Reasoning with geometry, Reasoning with proportion, Representations.
Each term is split into two halves with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills.
Number work is emphasised throughout the blocks alongside estimation.
Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials presented.
All students will be able to access the main content of all lessons and all students will be taught to the top with scaffolding, adaptive teaching and stretch and challenge provided where necessary.

Implementation:
There will be 6 blocks of approx. 6 weeks each. Each lesson will involve a retrieval starter usually a Mathsbox WR skills task or a WR flashback 4.
Independence and study skills will be fostered through challenging questions and problems, modelling, deep thinking and homework. All students will receive a PLC after each end of unit and termly assessment.
Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question.
Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.
A knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
Students will be given opportunities for awe and wonder where they are able to break down a barrier they had previously and encounter wow moments about the things they are learning.
Numeracy and calculator skills will be embedded.

Key Summative Assessments:

One formal assessment every term which comprises of 2 papers.

Shorter end of unit assessments after each unit.

DFM and Mathwatch Retrieval homework.

Live marking and low stakes quizzing

Autumn Term
Reasoning with Algebra
Constructing in 2 and 3 dimensions

Spring Term
Reasoning with Number
Reasoning with Geometry

Summer term

Reasoning with proportion
Representations
End of year Assessment.

Impact:
Students will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Year 9 Curriculum Overview

Autumn Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Straight line graphs Which equations create linear (straight line) graphs and why. How we can identify any straight line by its gradient and y intercept AND what these two things are. How do equations of straight lines link to the nth term rules of sequences, what is the same, what is different.	**Unit: Forming and Solving Equations** Solving equations involves the same operation on both sides using zero pairs and x/÷ to make 1's to make the unknow the subject.	**Unit: Testing conjectures** What are the key features of different types of numbers. What properties define standard shapes and the fact that some shapes can be in more than one group, for example a rectangle is also a parallelogram but not the other way round.	**Unit: Three dimensional shapes.** Understand the concept of surface area and find the surface area of shapes in an efficient way. Understand the derivation of and us the formula for the area of a circle.	**Unit: Constructions and Congruency.** How geometric properties and methods can be used to produce bisectors. Be able to recognize that for congruent shapes both side lengths and angle sizes are preserved.

Spring Term					
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics					
Unit: Numbers Identify and know the properties of different types of numbers. Calculate the four operations with fractions. Calculate the HCF and LCM of 2 or more numbers.	**Unit: Using Percentages** Calculate a percentage increase/decrease. Use percentages over 100%. Find percentage changes. Use multipliers in different contexts. Solve reverse percentage problems.	**Unit: Maths and Money** Explore financial maths including Bills and bank statements. Interest. Best buys.	**Unit: Deduction** Use all angle rules covered so far. Use algebraic methods to find missing angles. Use chains of reasoning to evaluate angles.	**Unit: Rotation and Translation** Identify the order of rotational symmetry of a shape. Find the result of rotating a shape. Translate points and shapes by a given vector. Understand variance and invariance in this context.	**Unit: Pythagoras Theorem** Identify the hypotenuse of a right angled triangle. Determine whether a triangle is right angled. Calculate missing sides in right angled triangles.

Summer Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Enlargement and Similarity . Enlarge shapes by a positive scale factor, including from a given point. Calculate the missing sides in similar shapes.	**Unit: Ratio and Proportion** Solve direct proportion problems. Use conversion graphs. Solve ratio problems given whole or part values. Solve simple inverse proportion problems. Calculate the 'best buy' using unit pricing.	**Unit: Rates** Calculate speed, distance and time. Solve problems involving density. Work with compound units.	**Unit: Probability** Find the relative frequency. Calculate the expected number of outcomes. Solve probability problems for independent events.	**Unit: Graphs, tables and algebra.** Drawing and reading from quadratic graphs. Interpreting other graphs. Plotting other graphs. Representing inequalities.

Y10

Summer

Assessment point

Indices & roots

What to expect:
Square and Cube Numbers, Estimate Powers and Roots (H) Calculate Roots and Indices, Fractional Indices (H), Calculate in Standard Form, Laws of Indices, Simplifying Expressions

$9^5 \div 9^2 = 9^3$

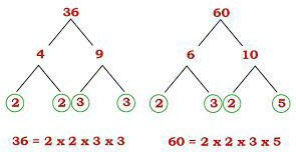
$4^6 \div 4^4 = 4^2$

$3^5 \div 3^{-7} = 3^{12}$

What do you notice?

Types of number & sequences

What to expect:
Factors, Multiples, Primes, LCM, HCF, Describe and Continue Sequences, Fibonacci Sequence, Linear Nth Term, Quadratic Nth Term (H)



May Half term

Non-calculator methods

$$\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

Collecting, representing & interpreting data

What to expect:
Understand Discrete, Continuous and Grouped Data, Charts, Table and Diagrams, Calculating Averages, Spread, Range and Outliers, Time Series, Histograms (H) Cumulative Frequency Curves (H), Box Plots (H), Quartiles (H)

Number of marks	Frequency	Mid-point	Frequency × Mid-point
0 - 9	3	$\frac{0+9}{2} = 4.5$	$3 \times 4.5 = 13.5$
10 - 19	7	$\frac{10+19}{2} = 14.5$	$7 \times 14.5 = 101.5$
20 - 29	9	$\frac{20+29}{2} = 24.5$	$9 \times 24.5 = 220.5$
30 - 39	6	$\frac{30+39}{2} = 34.5$	$6 \times 34.5 = 207$
	n = 25		Total = 542.5

Easter

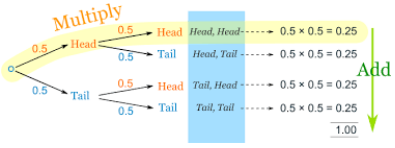
Assessment point

Surds & Rationalising

What to expect:
Surds (H), Calculations with Pi, Rationalise the Denominator (H), Rounding, Truncating, Lower and Upper Bounds

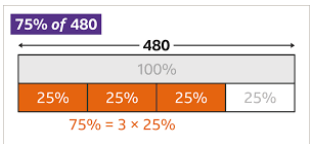
Probability

What to expect:
Predicting Outcomes, Understand Bias, Independent and Conditional Events, Tree Diagrams.



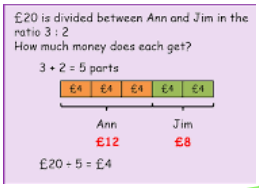
Percentages & interest

What to expect:
Percentage of Amounts, Percentage Change, Simple Interest, Growth and Decay including Compound Interest.



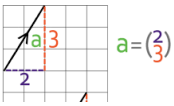
Ratio & Fractions

What to expect:
Simplify Ratio, Dividing into a Ratio, Compound Units, Lengths, Area and Volume with Ratios.



Feb Half term

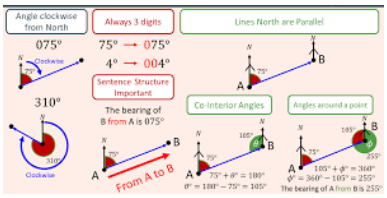
Vectors



What to expect:
Translation Vectors, Addition and Subtraction of Vectors, Parallel Vectors. Collinear Points

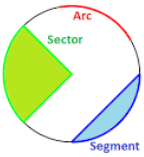
Angles & bearings

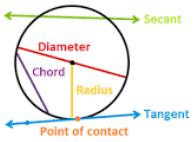
What to expect:
Bearings, Pythagoras and Trigonometry with Bearings

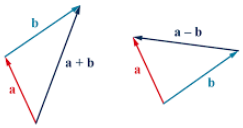


Working with Circles

What to expect:
Properties of a Circle, Parts of Circles, Surface Area and Volume of Spheres, Pyramids, Cones and Composite Solids, Circle Theorems



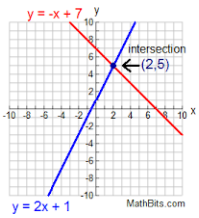




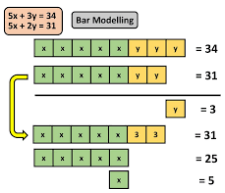
Xmas

Assessment point

Simultaneous equations

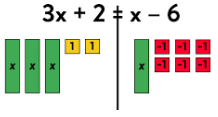


What to expect:
Solving Linear Simultaneous Equations, Quadratic Simultaneous Equations (H)



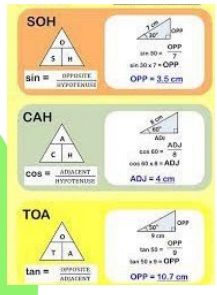
Representing solutions of equations & inequalities

What to expect:
Formulae, Derive Equations, Solve Equations, Interpret Solutions, Factorise Quadratic Equations (H), Solve Quadratic Equations (H) Solve Inequalities. Quadratic Inequalities (H)



Oct Half term

Trigonometry

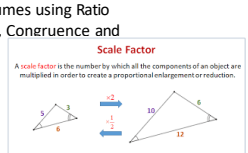


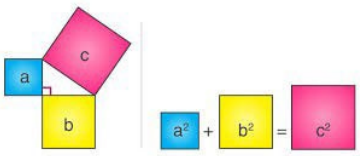
What to expect:
Trigonometric Ratios, Pythagoras Theorem, Exact Values on Sin Θ, Cos Θ and Tan Θ, Cosine and Sine Rule (H).

September

Congruence, similarity & enlargement

What to expect:
Compare Lengths, Areas and Volumes using Ratio Notations, Interpret Scale Factors, Congruence and Similarity, Counter Examples.





YEAR 10 CURRICULUM OVERVIEW - MATHS

The Big Picture – Intent:
Y10 Mathematics has been created to support flexibility while maximising progression. Topics covered revisit prior learning whilst enabling students to extend themselves and reach their potential.
'Learning Programme' blocks to be covered: Similarity, Developing algebra, Geometry, Proportions and proportional change, Delving into data, Using number.
Each term is split into two halves with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks h ave been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills.
Number work is emphasized throughout the blocks alongside estimation. Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials p resented.
All students will be able to access the main content of all lessons and all students will be taught to the top with scaffolding, adaptive teaching and stretch and challenge provided where necessary.

Implementation:
There will be 3 blocks of approx. 6 weeks each. Each lesson will involve a retrieval starter usually a mathsbox WR skills task or a WR flashback 4.
Independence and study skills will be fostered through challenging questions and problems, modelling, deep thinking and homework All students will receive a PLC after each end of unit and termly assessment.
Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question.
Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.
A knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
Students will be given opportunities for awe and wonder where they are able to break down a barrier they had previously and encounter wow moments about the things they are learning.
Numeracy and calculator skills will be embedded.

Key Summative Assessments:

One formal assessment every term which comprises of 2 papers.

Shorter end of unit assessments after each unit.

DFM and Mathwatch Retrieval homework.

Live marking and low stakes quizzing

Autumn Term
Reasoning with Algebra
Constructing in 2 and 3 dimensions

Spring Term
Reasoning with Number
Reasoning with Geometry

Summer term
Reasoning with proportion
Representations
End of year Assessment.

Impact:
Students will have increased understanding and confidence in Maths and be able to apply new skills to new and challenging mathematical problems.
Students will have developed their AO2/3 skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content.
They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Year 10 Curriculum Overview

Autumn Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Congruence similarity and enlargement Know that enlargement and similarity are versions of the same thing. Have an appreciation of the effect a centre of enlargement has on the location of a shape. Know what is the same and what is different about similarity and congruency.	**Unit: Trigonometry** Know that ratios between sides will be equivalent in similar right-angled triangles. Use the ratios combined with their knowledge of similar shapes. Use the non right angled area of triangle formula (H). Use the sine rule. (H) Use the cosine rule (H) Apply trigonometry in 3D. (H)	**Unit: Solutions of equations and inequalities.** Understand the meaning of a solution. Be able to explain the difference between an inequality and an equation. Describe the connection between a straight line graph and a linear (usually a 2 step equation). Use algebra tiles to demonstrate and explain the importance of zero pairs and making 1 when x or ÷ to solve.	**Unit: Simultaneous Equations** The meaning of simultaneous and what this means in an algebraic context and in terms of a graph. Solve simultaneous equations graphically. Solve simultaneous equations algebraically. Determine whether a given (x, y) is a solution to simultaneous equations.	**Unit: Angles and Bearings** Using cardinal directions and related angles Drawing, interpreting scale diagrams including use of bearings Understand, measure, and represent bearings Calculate bearings using angle rules Solve bearing problems using Pythagoras, trigonometry, sine and cosine rules

Spring Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Working with circles Calculating fractional parts of a circle. Calculating lengths of arcs and area of sectors Circle theorems for angles in semi-circles, same segments and cyclic quadrilaterals Understand and use volume and surface area of cones, cylinders and spheres	**Unit: Vectors** Understand and represent vectors and their notation Draw and use vector addition, subtraction and multiplication. Explore vector journeys in shapes, parallel vectors and their use in geometric arguments.	**Unit: Ratio and Fractions** Comparing quantities using a ratio Linking ratios and fractions Share amounts in a ratio given a total or one part Using ratios to make comparisons including using graphs Solving currency and best buy problems Use and interpret ratios of the form 1:n and n:1	**Unit: Percentages and Interest** Convert and compare fractions, decimals and percentages Work out percentages of amounts and express amounts as a percentage of another Increase and decrease by a percentage Calculate simple and compound interest Find an original value after a percentage change Solve problems involving growth and decay	**Unit: Probability** Find probabilities using equally likely outcomes Use the property that probabilities sum to 1 Using experimental probabilities Finding probabilities from tables, Venn diagrams and frequency trees. Construct sample space diagrams Calculate probability with independent events Using tree diagrams for independent and dependent events Construct and interpret conditional probabilities (tree diagrams, Venn diagrams and two-way tables

Summer Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Collecting, representing and interpreting data Understand populations and samples Primary and secondary data Construct and interpret two-way tables, frequency tables and frequency polygons Construct and interpret line and bar charts, including composite bar charts, and pie charts. Criticise charts and graphs Construct and interpret histograms, time series graphs Construct and interpret stem and leaf diagrams Construct and interpret cumulative frequency diagrams Construct and interpret box plots Compare distributions using charts and measures. Contruct and interpret scatter graphs, line of best fit and extrapolation	**Unit: Non Calculator Methods** Mental and written methods of integer/decimal add/subtract/multiply/divide. The four rules of fraction arithmetic Understand exact answers Understand and identify rational and irrational numbers Understand, use and calculate with surds Rounding to decimal places and significant figures Estimation Understand limits of accuracy and bounds Solve financial maths problems Break down and solve multi-step problems	**Unit: Types of numbers and sequences.** Understand the difference between factors and multiples Understand primes and expressing a number as a product of its prime factors Find the HCF and LCM of a set of numbers Describe and continue arithmetic and geometric sequences Describe sequences involving surds Find the nth term of a linear sequence Find the nth term of a quadratic sequence	**Unit: Indices and Roots** Square and cube numbers Calculate higher powers and roots Powers of ten and standard form Addition and subtraction rules for indices Work with powers within powers Understand and use the power zero and negative indices Understand and use fractional indices Calculate with numbers in standard form	**Unit: Manipulating Expressions** Simplify algebraic expressions Use identities Add and subract algebraic fractions Multiply and divide algebraic fractions Form and solve equations and inequalities with fractions Solve equations with algebraic fractions Represent numbers algebraically Algebraic arguments and proof

Summer

Y11

May Half term

EXTERNAL EXAMS START

Write your name here
Surname | Other names
Pearson Edexcel
Level 1/Level 2 GCSE (9-1)
Centre Number | Candidate Number
Mathematics
Paper 3 (Calculator)

Revision and reteaching of identified weaker areas.

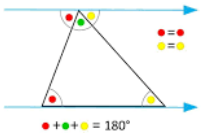
Mock Paper Feedback

Easter

Y11 MOCK SET 2

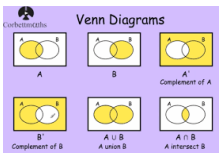
Show that...

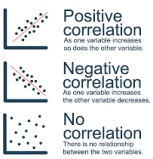
What to expect: Applying all contexts of maths to questions requiring you to use maths to 'show something' is true.



Listing & describing

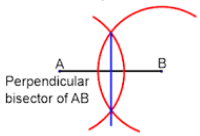
What to expect:
Organised Lists, Sample Spaces, Product Rule (H), Venn Diagrams, Plans and Elevations, Compare Distributions, Scatter Diagrams

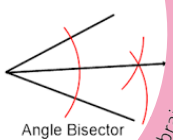




Transforming & constructing

What to expect:
The 4 transformations, Invariant Points and Lines (H), Constructions, Loci, Trig Graphs (H), Translations and Reflections of Graphs (H)

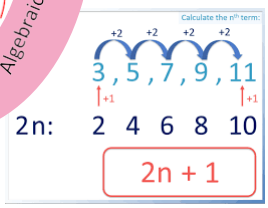




Feb Half term

Algebraic Reasoning

What to expect:
Simplify Expressions, Linear Nth Term, Quadratic Nth Term (H), Sequences, Simultaneous Equations, Proof (H), Inequalities in Two Variables (H)



Xmas

Mock Paper Feedback

Y11 MOCK SET 1

Multiplicative Reasoning

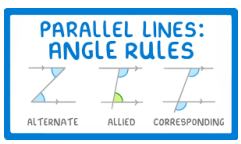
What to expect:
Scale Factors, Direct and Inverse Proportion, Direct and Inverse Proportion Equations (H), Pressure and Density,

men	→	days
10	→	4
1	→	$10 \times 4 = 40$
8	→	$\frac{40}{8} = 5$

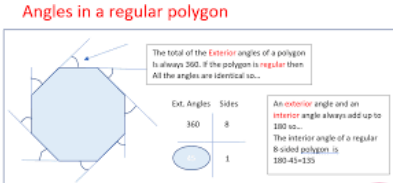
It takes 5 days for 8 men to dig the trench.
Note: 8 men take longer than 10 men.

Geometric Reasoning

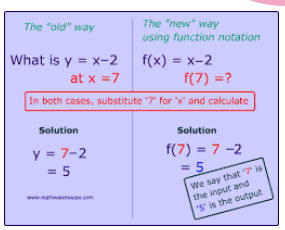
What to expect:
Angles at Points, Angles on Parallel Line and Shapes, Exterior and Interior Angles, Vectors, Circle Theorems (H)



Angles in a regular polygon



Functions



What to expect:
Function Machines, Substitution, Function Notation, Composite Functions (H), Inverse Functions (H), Quadratic Functions and Inequalities (H), Trigonometric Functions,

Changing the subject

What to expect:
Equations and Inequalities inc Shapes, Change the Subject, Known Formula, Complex Formula, Iteration (H)

$$3y = 12 - 2x$$

÷3 ÷3

$$y = 4 - \frac{2}{3}x$$

Expanding & Factorising

What to expect:
Expand a Factorise Single and Double Brackets, Solve Equations by Factorising, Complete the Square (H), Quadratic Formula (H)

$(2x - 4)(3x + 1)$

	3x	+ 1
2x	$6x^2$	2x
− 4	-12x	-4

$6x^2 - 10x - 4$

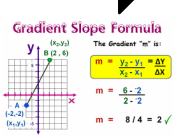
Oct Half term

Using graphs

What to expect:
Reflecting Shapes, Conversion Graphs, Real-Life Graphs, Distance Time Graphs, Speed/Time Graphs, Estimate the Area Under a Curve (H)

September

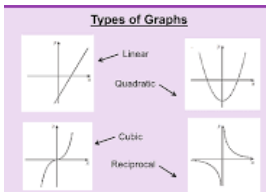
Gradients & lines

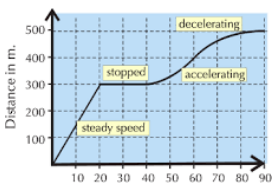


What to expect:
Equations of Lines Parallel to the Axis, Plot Straight Lines, y=mx+c, Equation of a Straight Line, Equation Given Two Points, Simultaneous Equations, Perpendicular Lines (H)

Non linear Graphs

What to expect:
Plot and Read Quadratic/ Cubic/Reciprocal Graphs, Recognise Graph Shapes, Interpret Quadratic Graphs. Exponential Graphs (H), Equation of a Circle (H), Equation of a Tangent (H)





YEAR 11 CURRICULUM OVERVIEW - MATHS

The Big Picture – Intent:
Y11 Mathematics is the final year of GCSE where students strengthen their mathematical skills and knowledge enabling them to succeed in their final examinations. There is an emphasis on reasoning skills and problem solving in preparation for the final examinations.
'Learning Programme' blocks to be covered: Graphs, Algebra, Reasoning. Each term is split into two halves with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills.
Number work is emphasised throughout the blocks alongside estimation. Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials presented.
All students will be able to access the main content of all lessons and all students will be taught to the top with scaffolding, adaptive teaching and stretch and challenge provided where necessary.

Implementation:
There will be 3 blocks of approx. 6 weeks each. Each lesson will involve a retrieval starter usually a Mathsbox WR skills task or a WR flashback 4.
Independence and study skills will be fostered through challenging questions and problems, modelling, deep thinking and homework. All students will receive a PLC after each end of unit and termly assessment.
Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question.
Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers.
A knowledge organiser will be provided for each block to enable students to recall keywords, facts, formulas and/or formal methods.
Students will be given opportunities for awe and wonder where they are able to break down a barrier they had previously and encounter wow moments about the things they are learning.
Numeracy and calculator skills will be embedded.

Key Summative Assessments:

One formal assessment every term which comprises of 2 papers.

Shorter end of unit assessments after each unit.

DFM and Mathwatch Retrieval homework.

Live marking and low stakes quizzing

Autumn Term
Graphs
Algebra
Mock Exams 1

Spring Term
Reasoning
Mock Exams 2

Summer term
GCSE Exams

Impact:
Students will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Year 11 Curriculum Overview

Autumn Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Graphs and Gradients Equations of lines parallel to the axis. Plot straight line graphs. Interpret y=mx+c. Find the equation of a straight line graph. Solve linear equations graphically. Explore perpendicular lines and their equations	**Unit: Non-Linear Graphs** Plot and read quadratic, cubic and reciprocal graphs. Recognise graph shapes Identify and interpret roots and intercepts of quadratics Understand and use the equations of exponential graphs Find and use the equation of a circle centre Find the equation of the tangent to any curve	**Unit: Using Graphs** Construct and interpret other real-life straight line graphs Construct and interpret distance/time graphs Construct and interpret speed/time graphs Recognise and interpret graphs that illustrate direct and inverse proportion Find approximate solutions to equations using graphs Estimate the area under a curve (H)	**Unit: Expanding and factorising** Expand and factorise with a single bracket Expand binomials Factorise quadratic expressions Factorise complex quadratic expressions Solve quadratic equations by factorisation Complete the square Solve quadratic equations using the quadratic formula	**Unit: Changing the subject** Form and solve equations and inequalities in the context of shape Change the subject of a simple, known or complex formula Change the subject where the subject appears more than once Solve equations by iteration

Spring Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit: Functions Substitution into expressions and formulae Use function notation Work with composite and inverse functions Graphs of quadratic functions Solve quadratic inequalities	**Unit: Multiplicative Reasoning** Use scale factors and understand direct proportion Calculating with pressure and density Understand inverse proportion and construction of inverse proportion equations Solving ratio problems	**Unit: Geometric Reasoning** Understand and use angle facts, at a point, in parallel lines and polygons Solving Vector problems Understand and apply Circle theorems Problem solving with pythagoras and the trigonometric ratios	**Unit: Algebraic Reasoning** Simplifying complex expressions Finding the nth term of linear and quadratic sequences Solving two linear simultaneous equations, and mixed linear/quadratic equations	**Unit: Transforming and constructing** Performing and describing line symmetry, reflection, rotation, rotational symmetry, translation and enlargements. Performing and describing series of transformations. Construction using ruler, protractor and compasses. Solving loci problems. Sketching and identifying translations and reflections of graphs of functions

Summer Term		
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics		
Unit: Listing and describing Working with organised lists, sample space and probability. Create and use Venn diagrams Construct and interpret plans and elevations Comparing distributions using data Interpreting scatter graphs	**Unit: Show that...** Using evidence and proofs to show that something is true using number, algebra, shape, angles, data , vectors and congruent triangles	**Unit: Revision and exams** **Review and revise...** Area, Volume, cirlces, Fractions, decimals, percentages, angles, Pythagoras, transformations and number.

YEAR 12 CURRICULUM OVERVIEW - MATHS

The Big Picture Intent:
Y12 Mathematics is designed to maximise progression in preparation for Y13 or AS Level outcomes. Many topics presents opportunities to recap on GCSE covered content linking this to brand new A-Level content. All topics give students the chance to extended themselves on the journey to achieving their potential.
The learning programme is designed so that students should be able to select and correctly carry out routine procedures, accurately recalling facts, terminology, and definitions. They should be able to reason, interpret and communicate mathematically, constructing rigorous mathematical arguments (including proofs) to make deductions and inferences. They would be encouraged to assess the validity of mathematical arguments, explain their reasoning; and use mathematical language and notation correctly. Lessons will include time helping pupils to translate problems in mathematical and non-mathematical contexts into mathematical processes, interpret solutions to problems in their original context, and, where appropriate, evaluate their accuracy and limitations. Use mathematical models and the evaluation their outcomes enables pupils to recognise the limitations of models and, where appropriate, explain how to refine them.

Implementation:

10 lessons are split between 2 teachers with each teacher having 5 lessons a fortnight. Both teachers share the delivery of the pure content and then one teacher teaches the statistics and the other the mechanics.

Lessons are based around developing a deeper understanding of concepts. Reasoning will be developed through exploration of mathematical patterns and looking where possible at proofs. Solving problems in different ways will be investigated where possible to demonstrate the many wonderful links in mathematics.

Formal structures to answering A level questions will be embedded as will numeracy and use of a graphical calculator to support specific topics at A level.

Key Summative Assessments:
2 to 3 cumulative formal assessments each term.

Summer term mocks based on the AS papers.

Mixture of DFM Retrieval and paper-based homework as well as some instances of flipped learning.

Live marking and low stakes quizzing when needed.

Students have separate independent study books which are monitored and checked half termly.

Autumn Term
Algebra and functions, Coordinate Geometry, Trigonometry, Vectors, Further algebra

Spring Term
Differentiation, Integration, Exponentials and Logs, Further Algebra, Kinematics, Representation and Interpretation

Summer term
Probability, Statistical Distributions, Hypothesis Testing, Forces and Newton's Law, Proof, Functions, Sequences and Series

Impact:
Students will have increased understanding and confidence in A-Level Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. Students will have developed skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Year 12 Curriculum Overview

Autumn Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit 1: Algebra and functions This foundational unit is crucial as it underpins many other areas in mathematics. Ensure you're comfortable with algebraic manipulation, solving equations, and understanding functions.	Unit 2: Coordinate geometry in the (x, y) plane Builds on your understanding of algebra and introduces the geometric interpretation of algebraic equations.	Unit 3: Further algebra Delves deeper into complex algebraic techniques and introduces new functions and their properties.	Unit 4: Trigonometry Focus on understanding angles, trigonometric functions, and their applications.	Unit 6: Differentiation These units introduce calculus, a fundamental part of modern mathematics, physics, and engineering. Differentiation deals with rates of change, while integration concerns areas under curves and accumulation of quantities.

Spring Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit 7: Integration These units introduce calculus, a fundamental part of modern mathematics, physics, and engineering.	Unit 5: Vectors (2D) Essential for understanding quantities with both magnitude and direction, setting the	Unit 6: Quantities and units in mechanics A brief unit focusing on the foundational concepts and measurements used in mechanics.	Unit 7a: Kinematics 1 (constant acceleration) Unit 7b: Kinematics 1 (constant acceleration) These units cover motion under constant	Unit 8a: Forces & Newton's laws Unit 8b: Forces & Newton's laws Unit 9: Kinematics 2 (variable acceleration)

Differentiation deals with rates of change, while integration concerns areas under curves and accumulation of quantities.	stage for further study in physics and engineering.		acceleration, a key concept in mechanics.	Fundamental principles governing motion and forces.

Summer Term				
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics				
Unit 1: Statistical sampling Introduces methods for collecting data, crucial for valid statistical analysis. Unit 2a: Data presentation and interpretation Unit 2b: Data presentation and interpretation	Unit 3: Probability The study of chance, foundational for understanding statistical distributions and hypothesis testing. Unit 4: Statistical distributions Covers specific distributions such as the	Unit 5a: Statistical hypothesis testing Unit 5b: Statistical hypothesis testing Introduces the framework for making inferences about populations based on sample data.	Unit 8: Exponentials and logarithms Prereq: Pure (AS) Unit 1: Algebra and functions To be able to use the laws of logs to solve mathematical problems Use exponentials to model real life problems and solve them	Revision (AS level) Formal examination (AS level) Unit 1: Proof Prereq: Pure (AS) Unit 3: Further algebra Unit 2: Algebraic and partial fractions Prereq: Pure (AS) Unit 3: Further algebra

YEAR 13 CURRICULUM OVERVIEW - MATHS

The Big Picture – Intent:
Y13 Mathematics is designed to maximise progression in preparation for Y13 Examination and Maths at Degree Level. Many topics presents opportunities to recap on Year 12 covered content linking this to brand new Year 2 A-Level content. All topics give students the chance to extended themselves on the journey to achieving their potential.
The learning programme is designed so that students should be able to select and correctly carry out routine procedures, accurately recalling facts, terminology, and definitions. They should be able to reason, interpret and communicate mathematically, constructing rigorous mathematical arguments (including proofs) to make deductions and inferences. They would be encouraged to assess the validity of mathematical arguments, explain their reasoning; and use mathematical language and notation correctly. Lessons will include time helping pupils to translate problems in mathematical and non-mathematical contexts into mathematical processes, interpret solutions to problems in their original context, and, where appropriate, evaluate their accuracy and limitations. Use mathematical models and the evaluation their outcomes enables pupils to recognise the limitations of models and, where appropriate, explain how to refine them.

Implementation:
Lessons are split between 3 teachers. 2 teachers have 4 lessons a fortnight sharing the pure and statistics content with the third teacher doing a small amount of pure and all the mechanics during 2 lessons a fortnight.

Lessons are based around developing a deeper understanding od concepts. Reasoning will be developed through exploration of mathematical patterns and looking where possible at proofs. Solving problems in different ways will be investigated where possible to demonstrate the many wonderful links in mathematics.

Formal structures to answering A level questions will be embedded as will numeracy and calculator skills specific to A level.

Key Summative Assessments:
Formal Assessment Autumn (2), Spring(1) plus Mocks.

Y13 January Mocks

Y13 March Mocks

Mixture of DFM Retrieval and paper based homework as well as some instances of flipped learning.

Live marking and low stakes quizzing when needed.

Students have separate independent study books which are monitored and checked half termly.

Autumn Term:
Algebraic Methods, Binomial Expansion, Differentiation, Proof, Trigonometry, Vectors, Sequences and Series, Moments. Projectiles.
Spring Term:
Projectiles(cont'd), Forces, Integration, Regression and correlation, functions, parametric equations.
Mock Exams (1)
Summer term:
Normal distribution, Integration (cont'd), parametric equations (cont'd), numerical methods, probability, Forces (cont'd), Kino.

Impact:
Students will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. There will be an increase in attainment, evidenced in regular, formal and interleaved assessments.

Focuses on how to effectively present and interpret statistical data	Binomial and Normal distributions, essential for modelling real-world processes.		To be able to differentiate exponentials	

Year 13 Curriculum Overview

Autumn Term							
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability, Statistics and Mechanics							
Algebraic Methods	**Binomial Expansion**	**Functions and Graphs**	**Trigonometry Functions**	**Parametric Equations**	**Trigonometry and Modelling**	**Numerical Methods**	**Differentiation**
Unit: Partial Fractions Repeated Factors Algebraic Division Proof	**Unit:** Expanding Binomials with Fractional and Negative Powers Using Partial Fractions to Expand Binomials	**Unit:** The Modulus Function Functions and Mapping Composite Functions Inverse Functions Combining Transformations	**Unit:** Reciprocal Trigonometric Functions. Inverse Trigonometric Functions. Trigonometric Identities	**Unit:** Parametric Equations. Using Trigonometric Identities. Curve Sketching Modelling with Parametric Equations.	**Unit:** Understanding and using Addition Formulae Solving Trigonometric Equations Modelling with Trig Equations	**Unit:** Locating Roots Iteration The Newton Raphson Method Application to Modelling	**Unit:** Differentiating Sin and Cos Differentiating Exponentials and Logs. Chain Rule Product Rule Quotient Rule Differentiating Trig Functions. Implicit Differentiation.

							Using Second Derivatives

Spring Term			
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics			
Vectors	**Integration**	**Mechanics**	**Statistics**
Unit: 3D coordinates & vectors in 3D Solving geometric problems Application to mechanics	**Unit:** Integrating standard functions Integrating f(ax+b) Using trigonometric identities Reverse chain rule Integration by substitution Integration by parts Partial fractions Finding areas Trapezium Rule Solving differential equations Modelling with differential equations	**Unit:** Moments Projectiles Forces Statics Further Kinematics	**Unit:** Regression and Correlation Conditional Probability The Normal Distribution

Summer Term	
Golden Threads: Number, Algebra ,Ratio and Proportions , Geometry and Measures, Probability and Statistics	

Unit: Revision	**Unit:** Exam