# Mathematics Long Term Plan - 2021

Maths is incredibly important in our lives and, without realising it, we use mathematical concepts, as well as the skills we learn from doing maths problems every day. The laws of mathematics govern everything around us, and without a good understanding of them, one can encounter significant difficulties in life.

Intent
Mathematics is an important creative discipline that helps us to understand and change the world.
We want all pupils at St Mary's Catholic College to experience the beauty, power and enjoyment of mathematics and develop a sense of curiosity about the subject with a clear understanding. At St Mary's we foster positive can do attitudes and we promote the fact that 'We can all do maths!'
We believe all children can achieve in mathematics, and teach for secure and deep understanding of mathematical concepts through manageable steps. We use mistakes and misconceptions as an essential part of learning and provide challenge through rich and sophisticated problems.
At our school, the majority of children will be taught the content from their year group only. They will spend time becoming true masters of content, applying and being creative with new knowledge in multiple ways.

We aim for all pupils to:
- become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- be able to solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios
reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.
- have an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately to be successful in mathematics.

| | | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 | Week 15 | Week 16 | Week 17 | Week 18 | Week 19 | Week 20 | Week 21 | Week 22 | Week 23 | Week 24 | Week 25 | Week 26 | Week 27 | Week 28 | Week 29 | Week 30 | Week 31 | Week 32 | Week 33 | Week 34 | Week 35 | Week 36 |
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| Year 7 | Year 7 Core | Sequences | | Understanding and Using Algebraic Notation | | | Equality and Equivalence | Learning Review Week | Equality and Equivalence | Place Value and Ordering Integers and Decimals | | | Fraction, Decimal and Percentage Equivalence | | Learning Review Week | Fraction, Decimal and Percentage Equivalence | Solving Problems with Addition and Subtraction | | Solving Problems with Multiplication and Division | WAWN Week | Solving Problems with Multiplication and Division | | Learning Review Week | Fraction and Percentages of Amounts | Four Operations with Direct Number | | Addition and Subtraction of Fractions | | Learning Review Week | Constructing, Measuring and Using Geometric Notation | | | Developing Geometric Reasoning | | | Learning Review Week |
| | | Pupils will know:<br>- How to describe, continue and check numerical and diagrammatic sequences<br>- How to use function machines and inverse operations with algebra<br>- The meaning of equivalence and it's links to algebra and solving equations | | Pupils will be able to:<br>- Use numbers and diagrams to describe, check and continue sequences<br>-Use number and algebra to investigate function machines and inverse operations<br>- Use inverse operations to solve one-step linear equations | | | | | Pupils will be able to:<br>- Solve problems using place value, comparing numbers, positioning numbers on a number line, rounding and the range and median.<br>- Convert fluently between fractions, decimals and percentages<br>- Represent fractions diagrammatically and identify equivalent fractions | | | | | | | Pupils will be able to:<br>- Apply mental and written methods to solve problems using addition and subtractions<br>- Apply mental and written methods to solve problems using multiplication and division<br>- Use the formulas to find the area of rectangles, triangles and parallelograms to solve problems | | | | | | | Pupils will be able to:<br>- How to use mental and written methods to find percentages and fractions of an amount<br>- How to use the four operations with directed number, including; ordering numbers, solving two-step equations and powers & roots<br>- How to add and subtract fractions and mixed numbers | | | Pupils will be able to:<br>- find percentages and fractions of amounts using mental and written methods<br>- Solve problems using directed number including those involving solving equations, powers and roots.<br>- Add and subtract fractions and mixed numbers, including those with different denominators | | | Pupils will be able to:<br>- Geometric notation and how to construct and measure angles and other geometric figures<br>-How to recognise and construct types of angle, triangle, quadrilateral and polygon<br>- The angle sums of angles around a point, on a line, in triangles, quadrilaterals and polygons. | | | Pupils will be able to:<br>- Construct and measure angles and other geometric figures using correct notation<br>- Calculate missing angles on a line, around a point and in triangles & quadrilaterals<br>- Calculate the internal and external angles of any polygon | | | |
| | Year 7 WS | Place Value | | Addition, Subtraction, Multiplication and Division | | | | Learning Review Week | Addition, Subtraction, Multiplication and Division | Fractions | | | | Position and Direction | Learning Review Week | Decimals | | Percentages | | WAWN Week | Algebra | | Learning Review Week | Converting Units | Perimeter, Area and Volume | | Ratio | | Properties of Shape | Learning Review Week | Properties of Shape | | Statistics | Investigation | | | Learning Review Week |
| | | Pupils will know:<br>- How to use the place value of a number to read, write, compare and round numbers<br>- How to use formal and written methods of the four operations to solve problems<br>- How to find factors, multiples and prime numbers | | Pupils will be able to:<br>- Read, write, compare and round numbers using place value<br>- Use the four operations to solve problems<br>- Use a variety of methods to factors, multiples and prime numbers | | | | | Pupils will know:<br>- How to simplify, compare, order and use the four operations with fractions<br>- How to find a fraction of a given amount<br>- Coordinates in all four quadrants and how to translate and reflect shapes on coordinate grids | | | Pupils will be able to:<br>- Add, subtract, multiply and divide fractions<br>- Use written and mental methods to find a fraction of a given amount or find the original given a fraction of an amount<br>- Plot and identify coordinates and translate and reflect shapes | | | | | Pupils will be able to:<br>Use a variety of methods to multiply and divide by powers of ten and to multiply and divide decimals.<br>Work with fractions, decimals and percentages to solve problems in a variety of contexts<br>Work with formulae, expressions and equations to solve algebraic problems | | | | | | | Pupils will know:<br>How to calculate area, perimeter and volume of shapes<br>Use ratio and proportion to work in a variety of different contexts<br>Basic angle facts and how to use a protractor accurately | | | Pupils will be able to:<br>Solve problems requiring them to find the area, perimeter or volume of shapes<br>Apply their knowledge of ratio and proportion to real life problems and contexts<br>Use a protractor to measure and draw angles and use angle facts to calculate missing angles. | | | Pupils will be able to:<br>- Angle facts associated with triangle, quadrilaterals and other polygons<br>- How to read, interpret and draw line graphs<br>How to read and interpret and construct pie charts accurately | | | Pupils will be able to:<br>Calculate missing angles in triangles, quadrilaterals and other polygons<br>Display information on a line graph and interpret data from a line graph<br>Accurately contruct pie charts and interpret data displayed on a pie chart | | | |
| Year 8 | Year 8 Core | Ratio and Scale | | Multiplicative Change | | Multiplying and Dividing Fractions | | Learning Review Week | Working in the Cartesian Plane | | | Representing Data | | Probability | Learning Review Week | Brackets, Equations and Inequalities | | | Sequences | WAWN Week | Indices | Standard Index Form | Learning Review Week | Standard Index Form | Fractions and Percentages | | | Number Sense | | Learning Review Week | Angles in Parallel Line and Polygons | | | Area of Trapezia and Circles | | Line Symmetry and Reflection | Learning Review Week |
| | | Pupils will know:<br>- The meaning of ratio<br>- How to use a conversion graph<br>- Multiply and divide any pair of fractions | | Pupils will be able to:<br>- Solve ratio problems<br>- Convert between currencies<br>- Represent multiplication of fractions pictorially | | | | | Pupils will know:<br>- How to plot coordinates in all 4 quadrants<br>- How to interpret a Scatter Graph<br>- How to construct sample space diagrams | | | Pupils will be able to:<br>- Identify lines parallel to both axis<br>- Understand and use correlation<br>- Find probabilities from their sample space diagrams | | | | | Pupils will be able to:<br>- How to expand multiple single brackets<br>- How to generate a sequence from a given rule in words<br>- How to simplify expressions involving indices | | | | | Pupils will be able to:<br>- Expand single and double brackets<br>- Find the next term in a sequence<br>- Use laws of indices to simplify expressions | | | | | | | Pupils will know:<br>- How to calculate with numbers in standard form<br>- How to convert between fractions, decimals and percentages<br>- How to round numbers to 1 significant figure | | | Pupils will be able to:<br>- Add, subtract, multiply and divide with numbers in standard form<br>- Calculate key fractions, decimals and percentages without a calculator<br>- Estimate the answer to calculations | | | Pupils will be able to:<br>- Understand and use basic angle rules and notation<br>- How to identify and calculate with alternate and corresponding angles<br>- Calculate the area of triangles, rectangles and parallelograms | | | Pupils will be able to:<br>- Calculate angles on straight lines and around a point<br>- Use alternate and corresponding angles to solve angle problems<br>- Calculate the area and perimeter of quadrilaterals | | | |
| | Year 8 WS | Sequences | | Understanding and Using Algebraic Notation | | | Equality and Equivalence | Learning Review Week | Equality and Equivalence | Place Value and Ordering Integers and Decimals | | | Fraction, Decimal and Percentage Equivalence | | Learning Review Week | Fraction, Decimal and Percentage Equivalence | Solving Problems with Addition and Subtraction | | Solving Problems with Multiplication and Division | WAWN Week | Solving Problems with Multiplication and Division | | Learning Review Week | Fraction and Percentages of Amounts | Four Operations with Direct Number | | Addition and Subtraction of Fractions | | Learning Review Week | Constructing, Measuring and Using Geometric Notation | | | Developing Geometric Reasoning | | | Learning Review Week |
| | | Pupils will know:<br>- How to describe, continue and check numerical and diagrammatic sequences<br>- How to use function machines and inverse operations with algebra<br>- The meaning of equivalence and it's links to algebra and solving equations | | Pupils will be able to:<br>- Use numbers and diagrams to describe, check and continue sequences<br>-Use number and algebra to investigate function machines and inverse operations<br>- Use inverse operations to solve one-step linear equations | | | | | Pupils will know:<br>- The place value of any digit and use this to solve a variety of problem<br>- How to convert between fractions, decimals and percentages<br>- How to represent fractions and work with equivalent fractions | | | Pupils will be able to:<br>- Solve problems using place value, comparing numbers, positioning numbers on a number line, rounding and the range and median.<br>- Convert fluently between fractions, decimals and percentages<br>- Represent fractions diagrammatically and identify equivalent fractions | | | | | Pupils will be able to:<br>- Apply mental and written methods to solve problems using addition and subtractions<br>- Apply mental and written methods to solve problems using multiplication and division<br>- Use the formulas to find the area of rectangles, triangles and parallelograms to solve problems | | | | | | | Pupils will know:<br>- How to use mental and written methods to find percentages and fractions of an amount<br>- How to use the four operations with directed number, including; ordering numbers, solving two-step equations and powers & roots<br>- How to add and subtract fractions and mixed numbers | | | Pupils will be able to:<br>- find percentages and fractions of amounts using mental and written methods<br>- Solve problems using directed number including those involving solving equations, powers and roots.<br>- Add and subtract fractions and mixed numbers, including those with different denominators | | | Pupils will be able to:<br>- Geometric notation and how to construct and measure angles and other geometric figures<br>-How to recognise and construct types of angle, triangle, quadrilateral and polygon<br>- The angle sums of angles around a point, on a line, in triangles, quadrilaterals and polygons. | | | Pupils will be able to:<br>- Construct and measure angles and other geometric figures using correct notation<br>- Calculate missing angles on a line, around a point and in triangles & quadrilaterals<br>- Calculate the internal and external angles of any polygon | | | |
| Year 9 | Year 9 Core | Straight Line Graphs | | Forming and Solving Equations | | Testing Conjectures | | Learning Review Week | Three-dimensional Shapes | | | Constructions and congruency | | | Learning Review Week | Numbers | | | Using Percentages | WAWN Week | Using Percentages | Maths and Money | Learning Review Week | Maths and Money | Deduction | | Rotation and Translation | Pythagoras' Theorem | | Learning Review Week | Geometry | Ratio and Proportion | | Ratio and Proportion | | Probability | Learning Review Week |
| | | Pupils will know:<br>- How to find the gradient of a straight line<br>- Form and solve equations<br>- Identify if a conjecture if true or false | | Pupils will be able to:<br>- Compare gradients of two or more straight lines<br>- Solve equations and inequalities<br>- Test algebraic conjectures | | | | | Pupils will know:<br>- The names and properties of 2D and 3D Shapes<br>- How to find the surface area of cubes and cuboids<br>- How to draw and measure angles | | | Pupils will be able to:<br>- Recognise 2D and 3D shapes<br>- Construct accurate nets of cuboids and other 3D shapes<br>- Construct and interpret scale drawings | | | | | Pupils will be able to:<br>- Solve problems including negative numbers<br>- Calculate percentage increase and decrease<br>- Interpret bank statements | | | | | | | Pupils will know:<br>- How to calculate wages and taxes<br>- How to calculate with angles in parallel lines<br>- Identify the hypotenuse of a right-angled triangle | | | Pupils will be able to:<br>- Solve problems with exchange rates<br>- Solve angle problems in parallel lines<br>- Calculate the hypotenuse of a right-angled triangle | | | Pupils will be able to:<br>- How to identify similar and congruent shapes<br>- How to solve problems involving direct proportion<br>-Solve speed, distance, time problems with a calculator | | | Pupils will be able to:<br>- Enlarge a shape by a given scale factor<br>- Solve problems using direct proportion graphs<br>-Interpret distance-time graphs | | | |
| | Year 9 WS | Ratio and Scale | | Multiplicative Change | | Multiplying and Dividing Fractions | | Learning Review Week | Working in the Cartesian Plane | | | Representing Data | | Probability | Learning Review Week | Brackets, Equations and Inequalities | | | Sequences | WAWN Week | Indices | Standard Index Form | Learning Review Week | Standard Index Form | Fractions and Percentages | | | Number Sense | | Learning Review Week | Angles in Parallel Line and Polygons | | | Area of Trapezia and Circles | | Line Symmetry and Reflection | Learning Review Week |
| | | Pupils will know:<br>- The meaning of ratio<br>- How to use a conversion graph<br>- Multiply and divide any pair of fractions | | Pupils will be able to:<br>- Solve ratio problems<br>- Convert between currencies<br>- Represent multiplication of fractions pictorially | | | | | Pupils will know:<br>- How to plot coordinates in all 4 quadrants<br>- How to interpret a Scatter Graph<br>- How to construct sample space diagrams | | | Pupils will be able to:<br>- Identify lines parallel to both axis<br>- Understand and use correlation<br>- Find probabilities from their sample space diagrams | | | | | Pupils will be able to:<br>- How to expand multiple single brackets<br>- How to generate a sequence from a given rule in words<br>- How to simplify expressions involving indices | | | | | Pupils will be able to:<br>- Expand single and double brackets<br>- Find the next term in a sequence<br>- Use laws of indices to simplify expressions | | | | | | | Pupils will know:<br>- How to calculate with numbers in standard form<br>- How to convert between fractions, decimals and percentages<br>- How to round numbers to 1 significant figure | | | Pupils will be able to:<br>- Add, subtract, multiply and divide with numbers in standard form<br>- Calculate key fractions, decimals and percentages without a calculator<br>- Estimate the answer to calculations | | | Pupils will be able to:<br>- Understand and use basic angle rules and notation<br>- How to identify and calculate with alternate and corresponding angles<br>- Calculate the area of triangles, rectangles and parallelograms | | | Pupils will be able to:<br>- Calculate angles on straight lines and around a point<br>- Use alternate and corresponding angles to solve angle problems<br>- Calculate the area and perimeter of quadrilaterals | | | |
| Year 10 | Year 10 Higher | Calculations, checking and rounding | Indices, roots, reciprocals and hierarchy of operations | Factors, multiples, primes, standard form and surds | | | Algebra: the basics, setting up, rearranging and solving equations | | Sequences | Averages and range | Representing and interpreting data and scatter graphs | | Fractions and percentages | | | Ratio and proportion | | Polygons, angles and parallel lines | | WAWN Week | Pythagoras' Theorem and trigonometry | | Graphs: the basics and real-life graphs | | Linear graphs and coordinate geometry | | Quadratic, cubic and other graphs | | Circle theorems | | Circle geometry | Transformations | Constructions, loci and bearings | | | Mock Exams | |
| | | Pupils will know:<br>-The laws of indices<br>- How to use the product rule for counting<br>- How to find HCF and LCM of two number | | Pupils will be able to:<br>-Complete calculations using decimals<br>- Use index laws to simplify and calculate the value of numerical expression<br>-Substitute numerical values into formulas and expressions | | | | | Pupils will know:<br>-How to find the nth term of quadratic sequences<br>How to interpret, analyse and compare the distribution of data<br>- How to estimate the mean from grouped data | | | Pupils will be able to:<br>-Generate specific terms in a sequences using the position to term and term to term rule.<br>-Construct a histogram<br>-Calculate averages and range from a frequency table | | | | | Pupils will know:<br>- How to use ratio to compare a scale model to real life<br>- The formula for Pythagoras Theorem and the trigonometric ratios<br>- How to find the interior angles of an n-sided polygon | | | | | Pupils will be able to:<br>- Find the value of an interior angle of any given shape<br>-Calculate the length of a line segment<br>- Calculate exactly with fractions and surds | | | | | Pupils will know:<br>-How to sketch a graph of a linear function using the gradient and y-intercept<br>-How to find approximate solutions of a quadratic equations from the graph<br>- How to plot graphs of equations to identify parallel and perpendicular line | | | Pupils will be able to:<br>- Find the equation of a straight line from a graph in the form ax + by = c<br>-Draw graphs of cubic functions<br>-Draw distance-time and velocity-time graphs | | | Pupils will know:<br>- How to use and interpret maps and scale drawings<br>- How to apply construction techniques and understanding loci to draw graphs<br>-How to use basic congruence criteria for triangles | | | Pupils will be able to:<br>Calculate bearing and solve bearing problems<br>- Find the equation of a tangent to a circle at a given point<br>- Translate a given shape by a vector | | | |
| | Year 10 Foundd | Integers and Place Value | Decimals | Indices, powers and roots | Factors, multiples and prime | | Algebra: the basics | | Expressions and Substitution into Formulae | Tables Charts and Graphs | Pie Charts | Scatter Graphs | Fractions,decimals and percentages | | Percentages | Equations and inequalities | | Sequences | Properties of shapes, parallel lines and angle facts | WAWN Week | Properties of shapes, parallel lines and angle facts | Interior and exterior angles of polygon | Statistics, sampling and the averages | | Perimeter, area and volume | | Real-life graphs | | Learning Review Week | Straight-line graphs | | | Transformations | | | Learning Review Week |
| | | Pupils will know:<br>- How to find factors, primes and multiples<br>- How to manipulate expressions<br>- How to understand apply the four operations on positive, negative and decimal numbers | | Pupils will be able to:<br>-Identify primes, factors and multiples and write a number as a product of it's prime factors<br>-Manipulate and simplify algebraic expressions by collecting like terms and multiplying together two simple algebraic expressions<br>- Add, subtract, multiply and divide positive, negative and decimal numbers and recall all multiplication facts to 10 × 10 | | | | | Pupils will be able to:<br>- How to expand and simplify expressions<br>- How to construct and interpret statistical diagrams<br>- Convert between mixed number and improper fraction and convert between equivalent fractions, decimals and percentages | | | | | | | Pupils will be able to:<br>-Solve problems involving percentage increase, decrease and change<br>-Expand and simplify expressions involving brackets and substitute numbers into simple algebraic expressions<br>-Design and use data collections sheets for grouped, continuous and discrete data | | | | | | | Pupils will be able to:<br>- How to solve equations and inequalities<br>- How to generalise and predict sequences<br>- How to solve angle problems | | | | | | | Pupils will be able to:<br>-Solve simple equations including those with integer coefficients, in which the unknown appears on either side or on both sides of the equation<br>- Find the nth term of a sequences<br>- Solve geometric problems involving angles in parallel lines, exterior and interior angles and angles in triangles | | | | | | | Pupils will know:<br>- How to calculate averages of a given data set<br>- How to calculate perimeter, area and volume of 2D and 3D shapes<br>- Interpret and solve problems involving real life graphs | | | Pupils will be able to:<br>-Calculate the mode, mean, median and range of a data set<br>-Solve problems involving perimeter, area and volume of regular and compound shapes<br>- Accurately draw and interpret information in real life graphs | | | Pupils will be able to:<br>- Plot simple linear equations<br>- Rotate and reflect 2D objects<br>- Translate and reflect 2D objects | | | |
| Year 11 | Year 11 Higher | Accuracy and bounds | Solving quadratic and simultaneous | Inequalities | | Probability | Multiplicative reasoning | | Similarity and congruence in 2D and | Graphs of trigonometric | Further trigonometry | | Collecting data | | Mock Exams | Cumulative frequency, box plots | Quadratics, expanding more than | Perimeter, area and circles | 3D forms and volume, cylinders, cones and spheres | | Changing the subject of formulae (more complex), algebraic fractions, solving | | Vectors and geometric proof | | Reciprocal and exponential graphs; Gradient and area under graphs | | Direct and inverse proportion | | Revision | | | | | | |
| | | Pupils will know:<br>- How to manipulate algebraic expressions, equations and inequalities<br>- How to calculate probabilities and represent them using diagrams<br>- How to use multiplicative relationships to calculate conversions between units of mass, capacity and length | | Pupils will be able to:<br>- Solve quadratic and linear equations, inequalities and simultaneous equations<br>- Calculate probabilities<br>- Represent multiplicative relationships in a variety of contexts | | | | | Pupils will know:<br>- How to work with similar shapes to calculate missing sides, areas and volumes<br>- Graphs of trigonometric functions and using trigonometry to solve problems<br>- The limitations of sampling and apply statistics to describe a population | | | Pupils will be able to:<br>- Calculate missing sides, area and volumes in similar 2D and 3D shapes<br>- Solve problems involving Trigonometry and trigonometric graphs<br>- infer properties of populations or distributions from a sample | | | | | Pupils will know:<br>- How to interpret and construct cumulative frequency graphs and histograms<br>- How to expand multiple brackets and sketch graphs of functions<br>- How to work with 2D and 3D shapes in a variety of contexts | | | Pupils will be able to:<br>- Display and interpret data using cumulative frequency graphs and histograms<br>- Expand multiple brackets and sketch graphs of functions labelling key points<br>- Calculate, area, perimeter, surface area and volume of 2D and 3D shapes | | | | | Pupils will know:<br>- How to use vectors to construct geometric arguments and proof<br>- What graphs of reciprocal and exponential functions look like<br>- Recognise and interpret graphs showing direct and inverse proportion | | | Pupils will be able to:<br>- Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors<br>- draw and apply transformations to reciprocal and exponential graphs<br>- Solve problems involving direct and inverse proprtion | | | | | | |
| | Year 11 Higher | Percentages | Vectors | Powers and Factors | Manipulating algebra and solving equations | Solving quadratics | Linear graphs | Quadratics, cubic and reciprocal graphs | Angles | | Fractions and Intervals | Ratio | Compound units | | | Outcome, tree diagrams and venn | Perimeter, area and volume | | Averages and Graphs | Cumulative frequency and box plots | Pythagoras' Theorem and trigonometry | | Sequences and change of subject | | Simultaneous equations | Transformations | | | | | | | | | | | |
| | | Pupils will know:<br>- how to calculate percentage increase and decrease<br>- how to work with vectors<br>- how to solve equations | | Pupils will be able to:<br>- Solve quadratic and linear equations<br>- Solve problems involving linear graphs<br>- Recognise quadratic, cubic and reciprocal graphs | | | | | Pupils will know:<br>- How to use angle sums to calculate missing angles in shapes and in parallel lines<br>- How to share an amount in a given ratio<br>- How to convert between units of speed, distance and time | | | Pupils will be able to:<br>- Solve problems involving fractions and ratio<br>- Solve problems involving angles<br>- Solve real-life problems involving speed, distance and time | | | | | Pupils will know:<br>- How to calculate probabilities using tree and Venn diagrams<br>- How to calculate the area of compound shapes<br>- The ratios for sine, cosine and tangent | | | Pupils will be able to:<br>- Solve problems in 2D and 3D using Pythagoras' Theorem and trigonometry<br>- Change the subject of a formula<br>- Interpret Cumulative Frequency fraphs and Box Plots | | | | | Pupils will be able to:<br>- How to solve simultaneous equations<br>- The effect that mutiple transformations have on a shape<br>- How to find the nth term of a sequence | | | | | | | | | | | | |
| | Year 11 Found | Ratio | Proportion | Right-angled triangles: Pythagoras and Trigonometry | | Probability | | | Multiplicative reasoning | Constructions, loci and bearings | | Quadratic equations: expanding and factorising | | | | Quadratic equations: graphs | Circles, cylinders, cones and sphere | | Fractions and reciprocals | | Standard form | Similarity and congruence in 2D | Vectors | | Graphs and equations | | | | | | | | | | | | |
| | | Pupils will know:<br>- use ratio and proportion with quantities<br>- calculating missing sides and angles of right angled triangles<br>- calculate the probabilities of events happening | | Pupils will be able to:<br>- Solve problems involving using ratio and proportion<br>- Use Trigonometry and Pythagoras to solve problems involving right angled triangles<br>- Solve problems involving probabilities | | | | | Pupils will know:<br>- Use a ruler, compass and protractor to draw a variety of constuctions<br>- Multiply a pair of brackets<br>- Factorise a quadratic into a pair of brackets | | | Pupils will be able to:<br>- Use constructions to solve problems with loci<br>- Solve problems involving multiplying and simplifying a pair of brackets<br>- Split a quadratic expression into 2 factors | | | | | Pupils will know:<br>- investigate the features of quadratic graphs<br>- how to find the volume and surface area of circles, cylinders, cones and spheres<br>- understand how standard form can be used for small and large numbers | | | Pupils will be able to:<br>- plot quadratics, and then identify the roots, turning point and other features<br>- solve problems involving the volume and surface are of 3D shapes<br>- solve problems involving using standard form in a variety of combinations | | | | | Pupils will know:<br>- be able to solve problems with equations<br>- use graphs to solve problems | | | | | | | | | | | | |
| Year 12 | Statistics | Algebraic Expressions (Chapter 1) | | Equations and Inequalities (Chapter 3) | | | Algebraic Methods (Chapter 7) | | Algebraic Methods (Chapter 7) | Data Collection (Chapter 1) | Measures of Location and Spread (Chapter 2) | | | Representations of Data (Chapter 3) | | Correlation and Regression (Chapter 4) | | Probability (Chapter 5) | | WAWN Week | Probability (Chapter 5) | Statistical Distributions (Chapter 6) | | Differentiation (Chapter 12) | | | | Integration (Chapter 13) | | | Probability (Chapter 2) Y2 | | Revision | | | | |
| | | Pupils will know:<br>-the laws of indices<br>- how to represent simultaneous equations on a graph<br>- how to use the factor theorem to factorise a polynomial | | Pupils will be able to:<br>- simplify expressions involving indices<br>- solve simultaneous equations<br>- simplify algebraic fractions | | | | | Pupils will know:<br>- the different types of data<br>- the different types of measures of central tendency<br>- how to compare data using statistical diagrams | | | Pupils will be able to:<br>- calculate the measures of central tendency<br>- calculate the variance and standard deviation<br>- complete statistical diagrams from data | | | | | Pupils will know:<br>- the difference between mutually exclusive and independent events<br>- how to draw tree diagrams for conditional probability<br>- the Binomial Distribution | | | Pupils will be able to:<br>- use Venn diagrams to calculate probabilities<br>- use Tree diagrams to calculate probabilities<br>- use the Binomial Distribution to calculate probabilities | | | | | Pupils will know:<br>- how to use differentiation to find the gradient of a curve<br>- whether a function is increasing or decreasing<br>- how to integrate a function | | | Pupils will be able to:<br>- differentiate functions with two or more terms<br>- solve problems involving differentiation<br>- find the area between a curve and the x axis | | | Pupils will know:<br>- Venn diagram regions<br>- show multiple events using tree diagrams | Pupils will be able to:<br>- calculate probabilities using Venn diagrams and tree diagrams | | | | |
| | Mechanics | Quadratic Functions (Chapter 2) | | Graphs and Transformations (Chapter 4) | Straight Line Graphs (Chapter 5) | | Circles (Chapter 6) | | Circles (Chapter 6) CTD | Modelling in Mechanics (Chapter 8) | Constant Acceleration (Chapter 9) | | Forces and Motion (Chapter 10) | | | The Binomial Expansion (Chapter 8) | Trigonometric Ratios (Chapter 9) | | Trigonometric Equations and Identities (Chapter 10) | WAWN Week | | | | Vectors (Chapter 11) | | Exponentials and Logs (Chapter 14) | | Variable Acceleration (Chapter 11) | | | Mock Exams | | | | | | |
| | | Pupils will know:<br>- the quadratic formula<br>- the effect that transformations have on cubic, quartic and reciprocal graphs<br>- the equation of a straight line | | Pupils will be able to:<br>- solve quadratic equations by factorising, using the formula and completing the square<br>- find the equation of a straight line<br>- find the equation of a circle | | | | | Pupils will know:<br>- why we use assumptions when modelling in mechanics<br>the constant acceleration formulae<br>- how to represent forces on a diagram | | | Pupils will be able to:<br>- use velocity time graphs to find the distance travelled<br>- use the ocnstant acceleration formulae to solve problems<br>- use forces diagrams to solve problems involving motion in 2D | | | | | Pupils will be able to:<br>- the Binomial expansion<br>- the Sine and Cosine rules<br>- the trigonometric identities | | | Pupils will be able to:<br>- use the Binomial expansion to solve problems<br>- solve triangle problems using the sine, cosine and area of a triangle rules<br>- solve trigonometric equations using trigonometric identities | | | | | Pupils will know:<br>- how to use vector notation<br>the laws of logarithms<br>- how to use differentiation and integration with acceleration | | | Pupils will be able to:<br>- solve geometric problems using vectors<br>- solve equations using logarithms<br>- use constant acceleration formulae | | | | | | |
| Year 13 | Statistics | Exponentials and Logs (Chapter 14) Y1 | | Algebraic Methods (Chapter 1) | | | Functions and Graphs (Chapter 2) | | Binomial Theorem (Chapter 4) | Statistical Hypothesis Testing (Chapter 7) Y1 | Regression and Correlation (Chapter 1) | | Differentiation (Chapter 9) | | | Differentiation (Chapter 9) | | | Integration (Chapter 11) | WAWN Week | Integration (Chapter 11) | | | Integration (Chapter 11) | The Normal Distribution (Chapter 3) | | | Vectors (Chapter 12) | | | Numerical Methods (Chapter 10) | Revision | | | | | |
| | | Pupils will know:<br>- the laws of logarithms<br>- how to use proof by contradiction<br>- how to combine transformations | | Pupils will be able to:<br>- solve equations using logarithms<br>- work with algebraic fractions<br>- find inverse and modulus functions | | | | | Pupils will know:<br>- How to apply the binomial epansion<br>- How to implement hypothesis testing<br>- How to interpret and calculate the correlation coefficient | | | Pupils will be able to:<br>-Apply the binomial expansion theorem<br>- Apply hypothesis testing and find critical values<br>-Caclulate the correlation coefficient | | | | | Pupils will be able to:<br>-How differentiate higher functions<br>-Differentiate using the chain, product and quotient rule<br>-How to integrate higher functions | | | Pupils will be able to:<br>-Differntiate trigonometric functions, exponentials and logarithms<br>-Use chain, product and quotient rule and how to use implicit differentiation<br>-Integrate standard functions and use trigonometric functions to solve integration problems | | | | | Pupils will know:<br>-How to integrate complex functions<br>-Solve geometric problems in 3D<br>-How to apply and interpret the normal distribution curve | | | Pupils will be able to:<br>-Solve problems based on the normal distribution curve<br>-Integrate by substition, parts and the reverse chain rule<br>-Solve vector problems in 3D and apply this to mechanics | | | Pupils will know:<br>- How to apply and implement numerical methods to solve problems in context | | | | | |
| | Mechanics | Trigonometric Equations and Identities (Chapter 10) Y1 | | | Variable Acceleration (Chapter 11) Y1 | | | | Sequences and Series (Chapter 3) | | Radians (Chapter 5) | Trigonometry (Chapter 6) | | Trigonometry and Modelling (Chapter 7) | | Trigonometry and Modelling (Chapter 7) | Moments (Chapter 4) | | Forces (Chapter 5) | WAWN Week | Forces (Chapter 5) | Parametric Equations (Chapter 8) | | Projectiles (Chapter 6) | | Application of Forces (Chapter 7) | | Further kinematics (Chapter 8) | | | Numerical Methods (Chapter 10) | Revision | | | | | |
| | | Pupils will know:<br>- the exact trigonometric values<br>- the trigonometric identities<br>- the constant acceleration formulae | | | Pupils will be able to:<br>- solve equations using trigonometric idenitities<br>- use differentiation and integration to solve problems involving acceleration | | | | Pupils will know:<br>- How to calculate the nth term of a arthimetic an geometric sequence<br>- Howe to convert betwendegrees and radians and apply this to trigonometric graphs and transformations<br>- Understand and use inverse trigonometric functions and their domains and range | | | Pupils will be able to:<br>- Calculate the nth term of a arthimetic an geometric sequence<br>- Convert betwendegrees and radians and apply this to trigonometric graphs and transformations<br>- Understand and use inverse trigonometric functions and their domains and range | | | | | Pupils will be able to:<br>- How to use trigonometric functions to model real life situations<br>- Calculate the turning effect of a force applied to a rigid body<br>-Resolve forces into components | | | Pupils will be able to::<br>- To use trigonometric functions to model real life situations<br>- Find the turning effect of a force applied to a rigid body<br>-Resolve forces into components | | | | | Pupils will be able to:<br>- How to model motion under gravity for an object projected horizontally<br>- How to find an unknown force when a system is in equilibrium<br>- How to differentiate and integrate vectors with respect to time | | | Pupils will be able to:<br>- Model motion under gravity for an object projected horizontally<br>- Find an unknown force when a system is in equilibrium<br>-Differentiate and integrate vectors with respect to time | | | Pupils will be able to:<br>- apply numerical methods to solve problems | | | | | |
| Resit | Aiming For Grade 4/5 | Ratio | Rates | Direct Proportion | Number Sense | Accuracy | Calculation | Equations and | Straight Line Graphs | Quadratic and Other | Angles Rules | Shape Properties | Similarity | Types of Number | Fractions and | Fractions and | Averages | Ratio and Fractions | Context Problems | WAWN Week | Area and Volume | Transforming Shapes | Right-angled | Manipulating Algebra | Manipulating Algebra | Sequences | Probability | Constructions | Representing Data | | Revision | | | | | | |
| | | Pupils will know:<br>- use ratio and proportion with quantities<br>- How to convert between units of speed, distance and time | | | Pupils will be able to:<br>- Solve problems involving fractions and ratio<br>- Solve real-life problems involving speed, distance and time | | | | Pupils will know:<br>- How to use angle sums to calculate missing angles in shapes and in parallel lines<br>- Convert between mixed number and improper fraction and convert between equivalent fractions, decimals and percentages | | | Pupils will be able to:<br>- Solve problems involving angles<br>-Solve problems involving percentages, decimals and fractions | | | | | Pupils will know:<br>- How to calculate averages of a given data set<br>- How to transform objects | | | Pupils will be able to:<br>-Calculate the mode, mean, median and range of a data set<br>- Rotate and reflect 2D objects<br>- Translate and reflect 2D objects | | | | | Pupils will know:<br>- How to manipulate expressions<br>- Use a ruler, compass and protractor to draw a variety of constuctions | | | Pupils will be able to:<br>-Manipulate and simplify algebraic expressions by collecting like terms and multiplying together two simple algebraic expressions<br>- Use constructions to solve problems with loci | | | | | |