# St Nicholas Catholic High School Curriculum Overview

## Name of Department: Maths

| | Year 7 | Year 8 | Year 9 |
|---|---|---|---|
| Autumn | • Place value for large numbers<br>• Formal methods for operations with integers<br>• Operations with negatives<br>• Write and simplify algebraic terms by adding and multiplying<br>• Understand prime numbers<br>• Find factors and multiples<br>• Find equivalent fractions and simplify fractions<br>• Add and subtract fractions and find fractions of amounts.<br>• Add and subtract decimals, and multiply decimals by integers<br>• Round to powers of 10 and decimal places<br>• Convert units of length<br>• Find area and perimeters of quadrilaterals and triangles<br>• To understand percentages and equivalence<br>• To calculate percentage change.<br>• To know the parts of a circle and find the area and circumference.<br>• To know and use the order of operations.<br>• To substitute numbers into simple formulae.<br>• To be able to use ratio and share quantities in ratio. | • Mixed operations with negatives<br>• Use index notation to simplify multiplications of algebraic terms<br>• Find HCF and LCM by listing<br>• Understand why there is no such thing as Highest common multiple and why there is not much use for a lowest common factor.<br>• Expand single and double brackets<br>• Factorise into single brackets<br>• Compare and order fractions<br>• Multiply and divide fractions<br>• Add and subtract fractions<br>• Mult decimals by decimals<br>• Convert fractions, decimals and percentages<br>• Round to significant figures<br>• Perimeter and area of quadrilaterals<br>• Surface area of cuboids<br>• To understand percentages and equivalence.<br>• To calculate percentage change.<br>• To understand and be able to calculate powers, roots, cubes<br>• To convert numbers between standard form and ordinary form and appreciate the applications in scientific contexts.<br>• To know the parts of a circle and find the area and circumference of full, semi and quarter circles.<br>• To know and use the order of operations.<br>• To substitute numbers into simple formulae including negatives.<br>• To be able to use ratio and share quantities in ratio. | • Be able to apply and understand mixed operations to integers and negatives<br>• Be able to apply index laws to problem solving questions<br>• To understand how to find using different methods HCF and LCM from prime factorisation<br>• Understand how to expand and factorise double brackets (where a = 1)<br>• Understanding and applying the four operations with fractions and mixed numbers<br>• Understanding and applying the four operations with decimals<br>• Understanding the method to find the area of compound shapes and surface area of prisms.<br>• Understand how to calculate percentage change.<br>• To understand decimal multipliers as equivalent to percentages for calculating percentage increase and decrease.<br>• To understand and be able to calculate powers, roots, cubes<br>• To know and apply the basic index laws.<br>• To know the parts of a circle and find the area and circumference of full, semi and quarter circles, simple arcs and sectors.<br>• To understand standard form and convert between ordinary form.<br>• To substitute numbers into simple formulae including negatives and positive integer powers.<br>• To be able to use ratio and share quantities in ratio, applying ratio to problem solving. |

| | | | |
|---|---|---|---|
| Spring | • To solve linear equations with up to two operations, including negative and fractional solutions.<br>• To be able to order and compare negative and positive integers<br>• To be able to draw and measure angles<br>• To understand and use basic angle facts<br>• To be able to work with co-ordinates in all four quadrants<br>• To be able to draw straight lines from their equations<br>• To describe, identify missing terms and continue on sequences<br>• To know the vocabulary of probability<br>• Understand probability of any outcome is between 0 and 1 inclusive, place events on probability line.<br>• Understand the difference between experimental and theoretical probability<br>• Be able to solve proportion problems, including recipes<br>• Be able to draw pictograms, bar charts and line charts<br>• Be able to draw, interpret and compare compound bar charts<br>• Be able to draw and interpret line graphs for time series data, pie charts, frequency polygons and stem & leaf diagrams<br>• Be able to plot scatter diagrams and describe correlation | • Understanding that an unknown is represented within an equation.<br>• Understanding how to unpick an equation to solve the unknown.<br>• Understanding the use of an inequality sign to represent a range of values.<br>• Understanding how to solve an inequality to find a possible range of values.<br>• Knowledge of angle facts pertaining to straight lines, points, parallel lines, triangles and quadrilaterals.<br>• To apply knowledge of angle facts to both find solutions and provide related reasoning.<br>• Recognition of y = mx + c as a rule which describes the linear relationship between the coordinate axis of a 2D plane. Understanding the practical interpretation of the m as a gradient.<br>• To recognise patterns within a linear sequence in order to generate a rule of the nth term.<br>• Understanding Pythagoras' Theorem and its application to right angled triangles.<br>• Knowing the vocabulary associated with probability and its numerical scale.<br>• Using the relationship of single events to calculate the probability of something happening and not happening.<br>• Using results of experiments to estimate probability.<br>• Knowing the relationship between speed, distance and time including associated compound units and applying this to calculate missing values.<br>• Understanding graphical representations of proportional relationships such as exchange rates.<br>• Comparing relative costs of different quantities of items in order to make best value judgements. | • Solving equations with unknowns on both sides, negative x coefficients and x's in the denominator<br>• Using equations to solve worded problems<br>• To understand function notation<br>• To solve inequalities, including double sided inequalities and represent the solution on a number line<br>• Solving algebraic problems in angle contexts<br>• Working with angles in polygons<br>• To understand straight line equations in the form $y = mx + c$<br>• To further develop understanding of the nth term for linear sequences<br>• To identify and generate quadratic sequences<br>• Be able to know and implement Pythagoras Theorem<br>• Be able to understand sine, cosine and tangent are ratios in right-angled triangles and know which one to use to find missing sides and missing angles in right-angled triangles<br>• Be able to apply systematic listing strategies and calculate probabilities<br>• Be able to complete and interpret two-way tables and use them to calculate probabilities<br>• Be able to use sample space diagrams to represent outcomes and use them to calculate probabilities<br>• Be able to interpret and complete Venn diagrams<br>• Be able to solve problems involving density, mass, volume and pressure, force, area and other compound measures<br>• Be able to draw and interpret line graphs |

| | | | |
|---|---|---|---|
| | | • Understanding the proportional relationship of 360 degrees in a circle to given contextualised frequency amounts in order to interpret pie charts. | |
| Summer | • How to calculate averages and range from a set of data<br>• Be able to draw and interpret ungrouped frequency tables.<br>• Be able to understand and apply the concepts of symmetry.<br>• Be able to perform and describe reflections using equations in the form x=a, y=b and y=x.<br>• Draw the net for a variety of 3D shapes<br>• Know the names of cubes, cuboids, prisms, cylinders, cones, pyramids and spheres<br>• Find the volume of cuboids using formula<br>• Convert between metric units for area and volume<br>• To estimate mass or volume of common objects<br>• Calculate the volume of a right prism<br>• Find lengths given volume<br>• To be able to use scales on maps | • Construct 3D shapes from nets<br>• Identify faces, vertices and edges<br>• Use formulae to find the volume of cuboids and prisms including compound 3D solids<br>• Convert between metric units for length, area and volume<br>• Use the relationship of distance and time data to a distance-time graph in order to interpret and plot travel graphs.<br>• Interpret and use scales on maps<br>• Knowledge of the ASA, SSS, SAS and RHS relationships of congruent triangles.<br>• Understand the different types of average and apply to a set of listed data.<br>• Understanding how data may be given in a frequency table and how to use this to calculate averages.<br>• Applying knowledge of sums and products in order to problem solve.<br>• Understand the quadratic relationship between the x and y axis of a 2D coordinate plane, including using substitution to find values on a table, plot the required parabolic shape on the axis and interpret values from the graph.<br>• Understanding the concept of symmetry, rotation and reflections, follow given instructions to perform such transformations and accurately describe given transformations.<br>• Understand similarity and find scale factors in order to find missing values. | • How to find averages and range from a set of data.<br>• How to calculate averages and range from ungrouped and grouped frequency tables.<br>• Be able to factorise quadratic expressions with common factors.<br>• Solve quadratic equations by factorising.<br>• Plot graphs for quadratic expressions and identify the y-intercept from a graph.<br>• To solve a quadratic from a graph.<br>• Be able to perform and describe reflections and rotations.<br>• Be able to perform and describe translations.<br>• Be able to enlarge shapes using a positive scale factor.<br>• Understand and apply the concept of similar triangles to find missing values and solve problems involving similar shapes.<br>• To be able to manipulate and solve 2 linear simultaneous equations using inspection.<br>• Convert between metric units for area and volume<br>• To be able to find the volume of compound prisms using their correct units.<br>• Find volume of cylinders<br>• To be able to draw and interpret distance-time graph<br>• To be able to draw and interpret a velocity-time graph<br>• To be able to use scales on maps<br>• To construct perpendicular bisectors of lines and angle bisectors |