# KS3 Mathematics Curriculum Coverage

## Year 9 Autumn Term

| Sequenced | Block 1: Measures of location | Block 2: Area of a trapezium and circles | Block 3: Straight line graphs and quadratic curves | Block 4: Forming and solving | Block 5: Testing conjectures | Block 6: 3D shapes |
|---|---|---|---|---|---|---|
| Key Knowledge | To know:<br>• how to calculate the mean, median, mode and range<br>• what an outlier is<br>• when a particular average is more appropriate than another to use<br>• that the total of discrete data in a frequency table is the sum of the data x frequency<br>how to find the midpoint between two numbers | To know:<br>• Pi is the ratio between the diameter and circumference of a circle<br>• Pi (π)=3.14 to 2 decimal places<br>• parts of a circle<br>• the relationship between the diameter and the radius is D = 2r<br>• the formula for the area of a trapezium, parallelogram and circle<br>• the location of relevant buttons on a calculator, including Pi<br>• that multiples of Pi and integers are not like terms<br>• to state the correct units for area and perimeter | To know:<br>• lines x = a , y = b, y=x and y=-x<br>• the shape of linear and quadratic graphs<br>• the equation of a line is y=mx +c<br>• m is the gradient, understand how this affects the steepness of the line<br>• c is the y intercept<br>• lines with the same gradient are parallel<br>• **the product of the gradients of perpendicular lines will always =-1 (H)**<br>• **gradients of perpendicular lines are the negative reciprocal (H)**<br>• **A quadratic curve form a U-shape (H)** | To know:<br>• understand and how to use inverse operations<br>• meaning of inequality signs<br>• to reverse an inequality when multiplying or dividing by a negative number<br>• method to solve equations with unknowns on both sides by keeping equality<br>• the difference between formulae and equation | To know:<br>• what a counterexample is<br>• what a conjecture is<br>• how and when to use negative Numbers and fractions within counterexamples and examples<br>• that expressions and calculations can be written in different ways<br>• what a binomial is<br>• the difference between numerical and algebraic factors<br>• the expansion of a pair of binomials is called a quadratic | To know:<br>• the names of 2d and 3d shapes<br>• how to identify prisms<br>• know the meaning of plan view and elevation views of 3d shapes<br>• the nets of 3d shapes<br>formulae for volume and surface area of a prism, cylinder, cone, pyramid, sphere |
| Key Skills | To be able to:<br>• calculate and use the mean, median and mode<br>• choose the most appropriate average<br>• find averages from a grouped and ungrouped frequency table<br>• identify outliers<br>compare distributions using averages and range | To be able to:<br>• calculate the area of a rectangles, parallelograms, triangles, trapezia and circles<br>• calculate missing lengths given the area of the above shapes<br>• calculate the area of circles and parts of circles with and without a calculator<br>• give answers as multiples of Pi and rounded to a given degree of accuracy<br>• calculate the area of compound shapes, including those with parts of circles | To be able to:<br>• find the equation of horizontal and vertical lines<br>• plot a linear graph from a table of values<br>• spot patterns in tables<br>• identify the effect of the gradient on a line<br>• compare intercepts<br>• identify parallel lines from their equations<br>• find the gradient of a line<br>• find the equation of a line<br>• **identify perpendicular lines from their equations (H)**<br>• interpret the gradient of a line to a given context<br>• interpret the y-intercept of a line to a given context<br>• **Plot a quadratic curve (H)** | To be able to:<br>• apply skills to solve 1 and 2 step equations and inequalities including with fractions and brackets<br>• check solutions by testing values either side of an inequality<br>• check by substituting when solving equations<br>• form and solve equations in mathematical concepts<br>• re-arrange simple formulae to change the subject | To be able to:<br>• express a number as a product of prime factors<br>• show a conjecture to be true or false by providing examples or proof<br>• develop more formal demonstrations that a statement is true or not<br>• use proof algebraically or using counterexamples<br>• calculating with directed numbers<br>• expanding single brackets (multiple methods)<br>• expanding double brackets (multiple methods)<br>• **expanding triple brackets (multiple methods)**<br>• simplifying algebraic terms | To be able to:<br>• draw the plan and elevation of 3d shapes. sketch and label a 3d shape given the plan and elevation<br>• draw the nets of 3d shapes<br>• calculate the volume and surface area of or missing lengths given the volume of surface area of prisms, cylinders, cones, pyramids, spheres.<br>calculate the volume and surface area of compound 3d shapes |
| | Tier 2 and 3 key vocabulary | Tier 2 and 3 key vocabulary | Tier 2 and 3 key vocabulary | Tier 2 and 3 key vocabulary | Tier 2 and 3 key vocabulary | Tier 2 and 3 key vocabulary |
| Subject specific | average mean median mode range modal value total frequency represent subtotal estimate midpoint outlier consistent spread | area triangle rectangle parallelogram formula units square rhombus trapezium/trapezia parallel perpendicular compound component shapes sector estimate infinite pi $\pi$ circle radius diameter squared in terms of pi significant figures decimal place calculate substitute | table of values, x axis, y axis, horizontal, vertical, parallel, intercept, y-intercept, straight line, equation, graph, coordinate, perpendicular, gradient, negative reciprocal, real life, direct proportion, inverse proportion | equation, inequality, solution, greater, less than, unknown, inverse, solve, expand, reverse, satisfy, coefficient, check, rearrange, subject, formulae | factor, multiple, prime, common, odd, even, express, conjecture, verify, counterexample, demonstrate, prove, binomial, quadratic, factorise, expression, expand, term, simplify | face edge vertex polygon prism cross section net dimensions area plan front/side elevation face perspective isometric solid perpendicular height units formulae compound dimensions surface open/closed cylinder pi curved surface area cube cuboid units commutative width length constant pyramid cone sphere base |