

KS4 Year 11 Group A

Subject: Mathematics

The mathematics department aim to develop the full potential of every student in the subject. It is our aim to ensure that every pupil experiences success and enjoyment in the subject, whether it be equipping them with sufficient mathematical skills for everyday life or developing problem solving and reasoning skills to take them beyond GCSE.

The scheme of learning is divided into units of study consisting of interlinking skills and topics that build on prior learning. Throughout the year students will complete multi-choice quizzes, homework, 'common homework tasks' and assessments. The common homework tasks will be completed by all students following this scheme of learning. The assessments provide opportunities for students to demonstrate their ability to recall information, methods of calculation and skills studied in previous units of work, and apply their problem solving skills to a variety of contextual problems.

	I will learn to	How I will be assessed
AUTUMN TERM	Unit 1 <ul style="list-style-type: none"> Simplify and manipulate algebraic expressions by expanding products of two and three binomials Factorise quadratic expressions of the form $x^2 + bx + c$ including the difference of 2 squares Solve quadratic equations by factorising, including rearranging before solving Sketch quadratic graphs and solve quadratic equations graphically Identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically Solve quadratic equations by using the quadratic formula 	Multi-choice Quiz Revision Homework Practice exam papers
	Unit 2 <ul style="list-style-type: none"> Simplify surds Simplify expressions using the rules of surds Expand brackets where the terms may be written in surd form Rationalise a denominator (stay with simple rationalising e.g. $5/\sqrt{2}$) Convert between fractions, decimals and percentages Change recurring decimals into their corresponding fractions and vice versa 	Multi-choice Quiz Revision Homework Practice exam papers
	Unit 3 <ul style="list-style-type: none"> Use index laws for multiplication and division of positive integers Calculate values using fractional indices, including finding missing values (e.g. $x^{2/3}=2^5$) Use index laws for multiplication and division of positive, negative and fractional indices Divide into a given ratio with a focus on finding the initial amount (e.g. Harry has £50 more than Claire....) Find the coordinates of a point given the ratio along a line Combine two two part ratios to one three part ratio (i.e. $A:B=5:6$, $B:C=8:11$, work our $A:C$ in its simplest form Convert between a ratio and its formula and be able to apply this to a problem ($x:y=7:4$ $x=7y/4$) 	

SPRING TERM	Unit 3	<ul style="list-style-type: none"> Solve numerical direct and inverse proportion problems Understand that an equation of the form $y = kx$ represents direct proportion and the k is the constant of proportionality. (Include x^2, x^3, \sqrt{x}, $\sqrt[3]{x}$) Understand that an equation of the form $y = k/x$ represents inverse proportion and that k is the constant of proportionality (Include x^2, x^3, \sqrt{x}, $\sqrt[3]{x}$) Understand that X is inversely proportional to Y is equivalent to X is proportional to $1/y$; construct and interpret equations that describe direct and inverse proportion. Draw an exponential graph and understand the main features of an exponential graph 	<p>Multi-choice Quiz</p> <p>Revision Homework</p> <p>Practice exam papers</p> <p>Mock exams</p>
	Unit 4	<ul style="list-style-type: none"> Solve linear inequalities in one variable and represent the solution on a number line Solve two linear simultaneous equations in two variables algebraically (elimination and substitution) Solve two linear simultaneous equations in two variables graphically. Form and solve two linear simultaneous equations Use systematic trial and improvement to find approximate solutions of equations where there is no simple analytical method 	<p>Multi-choice Quiz</p> <p>Homework</p> <p>Practice exam papers</p>
	Unit 5	<ul style="list-style-type: none"> Calculate the mean, mode and median from an ungrouped frequency table Calculate an estimate of the mean, the interval containing the median and modal class for a grouped frequency table Apply statistics to describe a population, using measures of central tendency and measures of dispersion Calculate quartiles and interquartile range from a small set of data Construct cumulative frequency graphs for grouped discrete and continuous data Estimate values from a cumulative frequency graph including lower quartile, upper quartile, median Construct and interpret a box plot Construct and interpret histograms with equal and unequal intervals for grouped discrete and continuous data Use a histogram to estimate the median and estimate frequencies Compare two distributions to make decisions about a hypothesis using diagrams and by comparing a suitable measure of average and measure of spread Interpret, analyse and compare the distributions of data sets using boxplots and appropriate measures of central tendency and spread, including quartiles, medians and inter-quartile range. 	<p>Multi-choice Quiz</p> <p>Homework</p> <p>Practice exam papers</p> <p>Mock exams</p>
	Unit 6	<ul style="list-style-type: none"> Describe and transform 2D shapes using single rotations Describe and transform 2D shapes using single reflections including finding the equation of the line of reflection Describe and transform 2D shapes using translation by vector notation Use column vector calculations Describe and transform 2D shapes using enlargements by a positive scale factor (include fractional scale factors) Identify the scale factor of an enlargement of a shape as the ratio of the lengths of two corresponding sides Understand the term 'invariance' for points and shapes Solve problems involving a combination of transformations Understand similarity of triangles and of other plane figures and identify shapes that are similar including all squares, all circles or all regular polygons with equal number of sides Apply the concepts of similarity including the relationships between lengths, areas and volumes in similar figures 	<p>Multi-choice Quiz</p> <p>Homework</p> <p>Practice exam papers</p>

SUMMER TERM	Unit 7	<ul style="list-style-type: none"> • Understand, recall and use Pythagoras' Theorem in 2D problems • Understand, recall and use trigonometric relationships in right-angled triangles, including problem solving involving bearings, Pythagoras and surds • Know the exact values of $\sin x$ and $\cos x$ for $x=0, 30, 45, 60$ and 90 and know the exact value of $\tan x$ for $x=0, 30, 45$ and 60 	Multi-choice Quiz Homework Practice exam papers
	Unit 8	<ul style="list-style-type: none"> • Understand and use a Venn diagram consisting of a universal set and at most two sets, which may or not intersect including shading areas and solving problems • Construct and use Venn diagrams to solve problems involving probability including set notation ie. $P(A)$ $P(A')$ $P(A \cup B)$ $P(A \cap B)$ • Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions • Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams • Apply the product rule for counting to calculation the number of combinations/permutations of a particular event 	GCSE Exams

How you can support your child's progress in mathematics:

- Encourage independence in repeated practice of unfamiliar topics using vle.mathswatch.co.uk/vle
- Provide real life opportunities to challenge your child's mathematical knowledge and skills. Examples could include; calculating change from a bill, estimating the cost of a restaurant bill, working out the best buy when shopping, working out the cost of a home improvement or the amount of supplies for a home improvement.
- Encourage the use of appropriate mathematics websites such as Nrich or Mathsgenie for 'rich' tasks and exam style questions.
- Encourage your child to attend revision sessions at school
- Encourage your child to follow the revision timetable for mathematics