THOMAS ALLEYNE`S HIGH SCHOOL

Maths (Foundation): LEARNING JOURNEY

OPPORTUNITY · PROGRESS · INDIVIDUALITY

6TH FORM

POST-16 PATHWAY

College/Apprenticeships

Year 11

Final Exams

In the summer term students take their GCSE exams. For maths this will involve to three 80-mark papers: one non-calculator and two calculator papers.

Any topic can be on any paper.

Revision and Past Paper Practice

In the final term of Y11 we use students previous assessments to revisit areas of weakness for revision and use past paper questions to practice and prepare students for the upcoming GCSE exams.

Quadratic equations
Non-linear graphs
Growth & decay
Vectors

Students will build on the previous work on double brackets to solve quadratic equations by factorising and graphically. Their knowledge of graphs will widen to include cubic and reciprocal graphs. The Y10 work on percentages will be reviewed and extended into compound growth and decay. Vectors will be introduced with students using column vectors, vector addition and scalar multiplication.

CEIAG 6th Form interviews take place Jan of Y11

Trigonometry
Forming equations
Quadratic graphs

Student will revisit trigonometry, consolidating the work from Y10 and learning the exact trig values. They will use their algebra skills to setup and solve equations before completing more work on simultaneous equations, including solving them graphically. Students will learn how to plot quadratic graphs, finding their roots, intercepts, turning points and approximate solutions.

$$\sin\alpha = \frac{AB}{CA} = \frac{opposite}{hypotenuse}$$
$$\cos\alpha = \frac{CB}{CA} = \frac{adjacent}{hypotenuse}$$
$$\tan\alpha = \frac{AB}{CB} = \frac{opposite}{adjacent}$$

Mock Exam

Students will start Y11 by reviewing some previous algebra work – simplifying, index laws, single brackets, substitution. They will extend this into double brackets and rearranging formulae. They will recap the Y9 work on probability and widen their knowledge to include sample space diagrams, Tree diagrams and Venn diagrams. They will learn about direct and inverse proportion, know what the graphs look like, and apply their knowledge to converting currencies, best buys and scaling recipes

Algebraic manipulation
Direct & inverse proportion
Probability

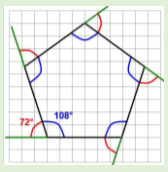
Students will draw and interpret conversion graphs and distance-time graphs. They will learn about inequalities – representing them on a number line and solving inequalities. They will extend the previous work on 3D shapes to include faces, edges and vertices, calculating the volume of prisms, pyramids, cones and spheres and recapping the surface area of these shapes.

Further circles
Polygons
Simultaneous equations

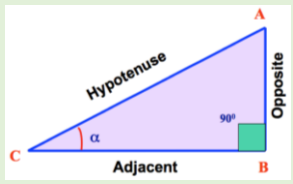
Real-life graphs
Inequalities
Volume & surface a

The topic of circles from Y9 is recapped and extended into answers in terms of pi, and finding the circumference and area of parts of circles (arc length and area of sector). The previous work on angles is broadened to include angles in regular and irregular polygons. Simultaneous equations are introduced.

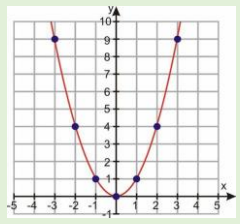
$$3x - 6y = 24$$
$$2x + y = 1$$



Students are introduced to Trigonometry. They learn how to label the sides of a triangle, what the 3 trig ratios are (sin, cos and tan) and how to use their calculators to find the missing angle or side in a right-angle triangle. The work on perimeter and area from Y9 is recapped and consolidated. The work on graphs is reviewed, more work is completed on the equation of a straight line and widened to include parallel lines.



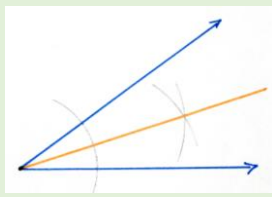
Students will build on the work on indices to convert to and from standard form, and then calculate with numbers in standard form. In the measures unit students will convert between both metric and imperial measures, learn about compound measures such as speed, density and pressure, and calculate with upper and lower bounds. Students will recap mean, median, mode and range and extend this into grouped and ungrouped frequency tables.



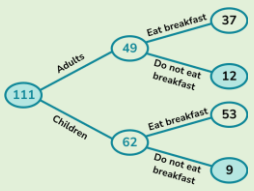
Intro to trigonometry
Further perimeter & area
Graphs

Constructions & loci
Congruence & similarity
Algebra recap

Standard form
Measures
Statistical measures



Students will change between ratio and fractions before simplifying and dividing with ratio. They will look at multiplicative relationships and best buys. In the probability unit students will list outcomes, calculate probabilities and draw and interpret two-way tables and frequency trees. They will extend the previous work on graphs into scatter graphs – plotting and interpreting, drawing lines of best fit, correlation and identifying outliers.



Students will review how to accurately construct triangles before moving onto constructing a perpendicular bisector and an angle bisector as well as solving loci problems. They will extend this into working with congruent triangles. Similar shapes will also be covered at this point. The algebra work from Y9 is recapped and consolidated – simplifying expressions, solving equations and sequences

$$a^n \times a^m = a^{m+n}$$
$$(a^n)^m = a^{mn}$$
$$a^m \div a^n = a^{m-n}$$
$$a^0 = 1$$

Ratio
Probability
Scatter graphs

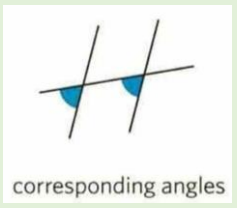
Equations
Pythagoras' Theorem
2D rep of 3D shapes

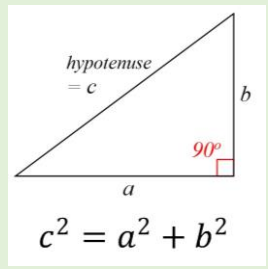
Indices
Percentages
Transformations

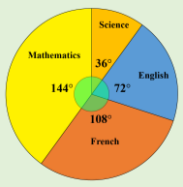
Students will start Y10 evaluating indices and learn to use the rules of indices. They will recap the percentages work from Y9 and extend it into calculating percentage increase and decrease as well as repeated change and reverse percentages. Students review and broaden work on reflections, rotations, translations and enlargement.

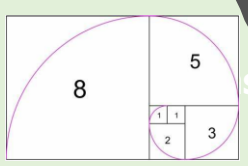
Student will continue and generate sequences before finding the nth term. They will learn about special sequences of numbers including triangle, square, cube, geometric, quadratic and Fibonacci sequences. Students will calculate percentages of amounts and percentage change. They will be able to convert between fractions, decimals and percentages. Students will learn the different part of a circle, understand what pi is and use it to calculate the circumference and area of circles. This will be extended to calculate the surface area of spheres, cones and pyramids.

Students will substitute values into expressions and formulae and solve simple equations. They will learn about Pythagoras and his theorem for right angled triangles – they will use this to calculate missing sides. Students will recap the names, properties and nets of 3D shapes before extending this to drawing plans and elevations and isometric drawings.









Sequences
Percentages
Circles

Coordinates & graphs
Rounding & estimation
Perimeter & area

Basic algebra
Fractions
Data

Basic Number
Angles
Scale drawings

Year 9

Y8 Taster Sessions / Transition days

Students will review plotting and reading coordinates before they use these to plot straight line graphs. The gradient and intercept will be used to find the equation of a straight line. Students will learn how to round to decimal places as well as significant figures, estimate calculations and find upper and lower bounds. Students will find the perimeter of shapes, the area of triangles, quadrilaterals and compound shapes. This will be extended to calculate the surface area of cuboids and prisms.

Students will ensure they understand algebra notation and use it to write and simplify expressions, they will work with single brackets. In the fractions unit students will order fractions and use the 4 operations. Students will know the different types of data and how they can collect data. They will the represent the data through tally charts, bar charts, pictograms and pie charts

Students will begin their journey in mathematics by ensuring their basic number skills are good – 4 operations, negative numbers, decimals, factors, multiples and prime numbers. They will recap the angle facts and rules and then extend these into angles on parallel line and bearings. They will also interpret and draw scale drawings..

WELCOME