ARNOLD LODGE
4 - 18 yrs Co-educational Independent Day School

KS4: Mathematics Curriculum Map

Year 10 Mathematics

The Year 10 curriculum is taught in the order shown below.

Foundation – Red
Crossover – Green
Higher – Blue

Topic	What is covered?
AVERAGES	1. Calculate the mode, range, median and mean from a list. 2. Find and use quartiles and the interquartile range. 3. Interpret data to identify appropriate averages. 4. Interpret and compare two data sets using the mean, median, mode and range. 5. Interpret and compare distributions using the interquartile range. 6. Finding averages from a frequency table 7. Find the averages and the estimated mean from a grouped frequency table
CIRCLES	1. Label and identify parts of a circle. 2. Calculate the circumference of a circle. 3. Calculate the circumference and perimeter of semi-circles and quarter-circles. 4. Problem solve to the find the diameter or radius from a circumference. 5. Calculate the area of a circle. 6. Calculate the area of semi-circles, quarter-circles, and compound shapes. 7. Problem solve to find the diameter or radius from the area. 8. Calculate the length of an arc. 9. Calculate the area of a sector. 10. Find the perimeter of a sector when given the area or the area when given the perimeter. 11. Apply the formula A = ½ abSinC to find the area of a segment.
RATIO AND EXCHANGE RATES	1. Write and simplify ratios, as well as finding equivalent ratios. 2. Write ratios as fractions. 3. Divide a given amount into a ratio, given one share or the total. 4. Divide a given amount into a ratio when given the difference. 5. Combining ratios to solve a problem. 6. Convert between currencies. 7. Read and interpret real life conversion graphs.
STATISTICAL DIAGRAMS 1	1. Read, complete, and interpret two-way tables. 2. Produce and interpret and compare frequency polygons for grouped data. 3. Complete and interpret scatter graphs, including correlation, line of best fit, interpolation and extrapolation. 4. Use proportion to solve capture and recapture problems.

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SURFACE AREA AND VOLUME	1. Calculate the volume of cubes and cuboids. 2. Calculate the volume of prisms. 3. Calculate the volume of cylinders. 4. Calculate the surface area of cubes and cuboids. 5. Calculate the surface area of prisms including cylinders. 6. Calculate the volume of pyramids and cones. 7. Calculate the volume of cone involving Pythagoras' Theorem. 8. Calculate the volume of spheres and hemispheres. 9. Calculate the surface area of pyramids and cones. 10. Calculate the volume of frustums. 11. Calculate the volume of volume of frustums involving Pythagoras' Theorem. 12. Calculate the volume of composite solids. 13. Calculate the surface area of composite solids. 14. Apply algebra to solve problems involving volume and surface area.
FRACTIONS RECAP AND SURDS	1. Add and subtract fractions with different denominators, mixed numbers and improper fractions. 2. Multiply and divide fractions with integers, improper fractions and mixed numbers. 3. Simplify expressions involving surds. 4. Apply the four operations with surds. 5. Expand double brackets with surds. 6. Rationalise the denominator of an expression where the denominator is a single surd. 7. Rationalise the denominator of an expression where the denominator contains surds.
GRAPHS 2	1. Read and interpret distance-time graphs. 2. Calculate speed from distance-time graphs. 3. Read and interpret speed-time graphs. 4. Calculate average speed or acceleration on non-standard real-life distance-time or speed-time graphs. 5. Read and interpret real-life linear graphs – e.g., conversion graphs. 6. Find the area under line graphs and interpret the results. 7. Estimate the areas under curved graphs and interpret the results.
PROBABILITY TREES	1. Equally likely outcomes. E.g., which spinner has an equal chance of landing on red. 2. Probabilities sum to 1. 3. Calculating single event probabilities. 4. Calculating probability from experimental data. 5. Calculating probabilities from two-way tables, Venn diagrams, and frequency trees. 6. Calculate probabilities from sample space diagrams. 7. Independent events. E.g., understand P(A and B) = P(A) x P(B). 8. Tree diagrams for independent events. 9. Tree diagrams for dependent events.

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	10. Conditional tree diagrams, also expressing probabilities algebraically.
FORMULAE AND FUNCTIONS	1. Substitute integers into formulae. 2. Change the subject of a formula. 3. Change the subject of a formula, where factorising is required. 4. Obtain or input of a function using function notation. 5. Write the reverse process of a function as the inverse function. 6. Use the succession of two functions as a composite function, including writing this as a single function. 7. Solve problems involving functions.
STAISTICAL DIAGRAMS 2	1. Read and complete a pictogram. 2. Draw bar charts from a frequency table including dual/composite. 3. Find the mode, median, mean and range from a stem and leaf diagram. 4. Construct pie charts. 5. Read and interpret pie charts. 6. Construct a cumulative frequency diagram. 7. Interpret cumulative frequency diagram. 8. Construct and complete box plots. 9. Interpret box plots. 10. Make comparisons between two distributions using box plots. 11. Construct a histogram with unequal class widths. 12. Interpret histograms with unequal class widths. 13. Estimate from a histogram.
PERCENTAGES 2	1. Perform percentage increase or decrease. 2. Solve a percentage change given context. 3. Express percentages and percentage changes as a decimal. 4. Calculate simple interest. 5. Calculate compound interest. 6. Calculate the overall percentage change after repeated percentage changes. 7. Solve original value problems.

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TRANSFORMATIONS I	1. Understand the basic terminology of transformations. 2. Understand and draw translations when given the vector. 3. Find the vector when given the translation. 4. Understand and draw reflection when given the line of reflection. 5. Draw and name the line of reflection when given the original and reflected shape. 6. Understand and draw rotations around a point. 7. Describe rotations using angles and direction. 8. Enlarge shapes with a positive integer scale factor and a point of enlargement. 9. Enlarge shapes with a positive fractional scale factor and a point of enlargement. 10. Enlarge shapes with a negative scale factor with a point of enlargement. 11. Describe an enlargement with the scale factor and point of enlargement. 12. Understand and draw composite transformations. 13. Describe composite transformations.
REVISION AND ASSESSMENT PREPARATION	
Cumulative Assessments every Half Term covering all topics.	All assessments have a revision lesson, an assessment lesson and a review lesson

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KS4: Mathematics Curriculum Map

Year 11 Mathematics

The year 11 curriculum is taught in the order shown below.

Foundation – Red

Crossover – Green

Higher - Blue

Topic	What is covered?
CONSTRUCTIONS AND CIRCLE THEOREMS	1. Accurately construct triangles from ASA and SAS information. 2. Accurately construct triangles from SSS information. 3. Construct a perpendicular bisector of a line. 4. Construct an angle bisector. 5. Construct a perpendicular to a given line from a point. 6. Use constructions to solve loci problems. 7. Identify the standard circle theorems and match them to their correct statements. 8. Apply the circle theorems to find missing angles. 9. Prove the standard circle theorems.
GRAPHS 3	1. Plot graphs of linear functions. 2. Plot graphs of quadratic functions. 3. Find the roots, intercepts and turning points of quadratic functions. 4. Complete the square to find the turning point of quadratic functions. 5. Use roots, intercepts and turning point of quadratics to sketch the graph. 6. Plot reciprocal functions $y = \frac{n}{x}$ where x is not 0. 7. Plot graphs of exponential functions $y = k^x$ for positive k. 8. Recognise and interpret the equation of a circle. 9. Calculate where a given points lies inside, on or outside a circle. 10. Find the equations of a tangent to a circle. 11. Recognise and sketch graphs of trigonometric functions. 12. Use trigonometric functions to find solutions to trigonometric equation between a given range. 13. Sketch graph transformations e.g. translation, stretches and reflections. 14. Describe and sketch combined transformations of functions. 15. Recognise and sketch trigonometric function transformations and state turning points.
PROPORTION	1. Find the cost of items using the unitary method. 2. Solve best value problems. 3. Use proportion to solve recipe problems. 4. Solve direct proportion problems.

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	5. Solve inverse proportion problems. 6. Form an equation using variables in direct proportion and find the constant of proportionality. 7. Form an equation using variables in inverse proportion and find the constant of proportionality. 8. Solve and interpret the answers in growth and decay.
ALGEBRAIC FRACTIONS AND PROOF (HIGHER ONLY)	1. Simplify algebraic fractions. 2. Solve equations involving algebraic fractions. 3. Use algebra to construct arguments and prove identities. 4. Disprove statements by counterexample. 5. Express a number property using algebra. 6. Construct simple algebraic proofs. 7. Construct complex algebraic proofs
SIMILARITY, CONGRUENCE AND ELEVATIONS	1. Construct and interpret plans and elevations of 3D shapes. 2. Find the missing side length in two shapes that are similar. 3. Prove two triangles are similar. 4. Apply concepts of similarity, including the relationships between lengths, areas, and volumes. 5. Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS). 6. Prove two triangles are congruent.
VECTORS	1. Describe direction vectors as column vectors and vice versa. 2. Add and subtract vectors (use diagrammatic and column representations). 3. Multiply vectors by a scalar (use diagrammatic and column representations). 4. Use vectors to solve geometrical problems, including midpoints and lines divided into a ratio. 5. Use vectors to construct geometrical proofs (lines are parallel, points lie on a straight line).
REVISION AND EXAM PREPARATION	
Cumulative Assessments every Half Term covering all topics.	All assessments have a revision lesson, an assessment lesson, and a review lesson