Armfield Academy – Mathematics Department

Year 11 Curriculum Overview

Home Learning is completed using Century Maths. A Home Support guide can be found here.

Half Term 1		
Date	Curriculum Overview	HIGHER ONLY
WC 29/08	**Data: Collecting, representing and interpreting data** • Find and interpret averages from a list • Find and interpret averages from a table • Problem solving questions with mean • Construct and interpret time series graphs • Construct and interpret stem-leaf diagrams • Construct and interpret two-way tables • Construct and interpret frequency tables and frequency polygons • Construct and interpret line and bar charts • Construct and interpret pie charts • Scatter graphs – Correlation/Lines of best fit • Criticise charts and graphs • Stratified sampling	**•Construct and interpret cumulative frequency diagrams** **•Use cumulative frequency diagrams to find measures** **• Construct and interpret Box plots** **•Construct and interpret histograms** **• Compare distrubutions** **•Linear interpolation grade 8/9 only**
WC 05/09		
WC 12/09	**Number 1 -Using number (Non calculator methods) (Indices and roots)** • Mental/written methods of integer/decimal addition and subtraction • Mental/written methods of integer/decimal multiplication and division • Four rules of fraction arithmetic • Rounding to decimal places and significant figures • Estimate answers to calculations	**Recurring decimals conversions** **Calculations with recurring decimals, non calc** **Understand and use surds** **Calculate with surds** **Upper and lower bounds/ bound calculations** **Understand and use fractional indices**
WC 19/09	• Bounds, focussing on error intervals (including truncating). • Understand the difference between factors and multiples • Understand primes and express a number as a product of its prime factors • Find the HCF and LCM of a set of numbers • Square and cube numbers • Calculate higher powers and roots • Powers of ten and standard form • Calculate with numbers in standard form • The addition and subtraction rules for indices	

WC 26/09	• Work with powers of powers • Understand and use the power of zero and negative indices	
WC 03/10	**Graphs** ● Interpret real life graphs ● Find the ccoordinates for the midpoiont of two cords ● Equations of lines parallel to the axis ● Plot straight line graphs ● Interpret $y = mx$ + c	● Recognise when straight lines are perpendicular ● Find the equations of perpendicular lines
WC 10/10	● Find the equation of a straight line from a graph ● Equation of a straight-line graph given one point and gradient ● Equation of a straight-line graph given two points ● Determine whether a point is on a line ● Parallel lines (equal gradients)- Know how to give an equation that is parallel ● Solve linear simultaneous equations graphically ● Plot and read from quadratic graphs ● Plot and read from Cubic and reciprocal graphs	
Date	Curriculum Overview	
WC 31/10	**Algebra 1** ● Simplify algebraic expressions ● Forming expressions and formula from words ● Multiplying out brackets and simplifying ● Substitution ● Solving Equations ● Forming Equations from words and diagrams	● Factorise complex quadratic expressions ● Solve complex quadratic expressions by factorisation ● Complete the square ● Solve quadratic equations using the quadratic formula ● Add/subtract/multiply/divide Algebraic fractions ● Solve equations with Algebraic fractions
WC 07/11	● Linear Inequalities and number lines ● Simple factorisation	
WC 14/11	● Multiplying out two brackets ● Factorising a quadratic ● Difference of two squares ● Solve Quadratic equations by factorising	
WC 21/11	**Probability** • Single event probability • Listing outcomes	•Capture – recapture Use the product rule for counting •Conditional probability, involving equations for grade 8/9

	Frequency trees Complete and use Venn diagrams • Tree diagrams	
WC 28/11	**Angles – Year 11 Mocks taking place** ● Angles on straight line ● Angles in Triangles and special triangles ● Angle at a point add to 360 ● Parallel lines / vertically opposite angles / Alternate /corresponding ● Combination problems (Angle /Reason when tackling exam problems) ● Know names / properties of basic shapes ● Interior and exterior angles of polygon ● Bearings	**•Circle Theorems**
WC 05/12		
WC 12/12	**Mock review – Reteach week**	
	Half Term 3	
Date	Curriculum Overview	
WC 02/01	**Algebra 2**	
WC 9/01	● Recognise sequences of odd and even numbers, and other sequences including Fibonacci sequences ● Write the term-to-term definition of a sequence in words ● Find a specific term in the sequence using position-to-term or term-to-term rules ● Generate arithmetic sequences of numbers, triangular numbers, square and cube integers and sequences derived from diagrams ● Recognise such sequences from diagrams and draw the next term in a pattern sequence; ● Find the next term in a sequence, including negative values; ● Find the nth term- For a pattern sequence, Linear sequence ● Use the nth term of an arithmetic sequence to - generate terms, decide if a given number is a term in the sequence, or find the first term over a certain number ● Generate terms of a quadratic sequences ● change the subject of a formula	● Find the nth term of quadratic sequence ● Geometric sequences (not the nth term) • Complex changing the subject, including factorising • Proof
WC 16/01	**Ratio and Proportion**	
WC 23/01	● Write ratios in their simplest form ● Write/interpret a ratio to describe a situation ● Use Fractions in ratios ● Share a quantity in a given ratio including three-part ratios ● Solve a ratio problem in context	Direct/Inverse proportion ● Constant of proportionality problems ● Equations with proportion (constant of proportionality)

	• Compare ratios • Write ratios in form 1 : m or m : 1 • Solve proportion problems using the unitary method; • Direct Proportion • Inverse proportion (only simple ones, eg builders building a wall) • Work out which product offers best value and consider rates of pay	
WC 30/01	**Compound measures** • Speed, distance, time. (Focus on multi stage) • Pressure (focus on which 'area' to find) • Density (focus on mixtures) • Converting compound units eg k/h to m/s	• Area under a curve • Calculating and interpreting Gradient of curves • Understand gradient of curve represents acceleration
WC 06/02	- **Shape 2** - Identify and name common solids: cube, cuboid, cylinder, prism, pyramid, sphere and cone - Find the perimeter and area of rectangles and triangles; parallelograms and trapezia; compound shapes, - Sketch nets of cuboids and prisms - Recall and use the formula for the volume of a cuboid; - Find the surface area and volume of a prism, including a triangular prism, cube and cuboid; - Calculate volumes of right prisms and shapes made from cubes and cuboids; - Identify, name and draw parts of a circle including tangent, chord and segment; - Recall and use formulae for the circumference of a circle and the area enclosed by a circle; circumference of a circle = $2\pi r = \pi d$, area of a circle = $\pi r2$; Use $\pi \approx 3.142$ or use the π button on a calculator; - Find the radius or diameter, given the area or perimeter of a circle; - Calculate perimeters and areas of composite shapes made from circles and parts of circles; - Find the surface area and volume of a cylinder - Find the surface area and volume of spheres, pyramids, cones and composite solids. - Calculate arc lengths, angles and areas of sectors of circles; - Plans and elevations	• Area of a segment using Using A = 1/2 ab sin c (deliberately before trig) • Frustrums (if time, they have never appeared on new spec papers. Also not mentioned in Pearson spec. Link with similar cones.)
Half Term 4		
Date	Curriculum Overview	
WC 20/02	- **Shape 2** Continued- see above	

WC 27/02 WC 06/03	**Pythagoras and Trigonometry** • Understand, recall and use Pythagoras' Theorem in 2D, including leaving answers in surd form; • Given 3 sides of a triangle, justify if it is right-angled or not; • Calculate the length of the hypotenuse in a right-angled triangle, including decimal lengths and a range of units; • Find the length of a shorter side in a right-angled triangle; • Apply Pythagoras' Theorem with a triangle drawn on a coordinate grid; • Calculate the length of a line segment AB given pairs of points; • Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D figures; • Use the trigonometric ratios to solve 2D problems; • Find angles of elevation and depression; • Round answers to appropriate degree of accuracy, either to a given number of significant figures or decimal places, or make a sensible decision on rounding in context of question; • Know the exact values of sin θ and cos θ for $\theta = 0°, 30°, 45°, 60°$ and 90°; know the exact value of tan θ for $\theta = 0°, 30°, 45°$ and 60°.	Use trigonometry and pythagoras in 3D Sine and Cosine Rules (Include some bearings trig questions here if time for the most able)
WC 13/03	**Number 2 Fractions Percentages and Decimals** • FDP equivalence • Express a given number as a percentage of another number in more complex situations; • Calculate percentage profit or loss; • Make calculations involving repeated percentage change, not using the formula; • Find the original amount given the final amount after a percentage increase or decrease; • Use compound interest • Growth and decay	• Reverse compound interest - finding the power or the percentage
WC 20/03 WC 27/03	**Transformations** Perform reflections, rotations, translations and positive enlargements Fractional enlargements •Identify and desribe transformations •Combined transformations	• Negative enlargements • Understand and use trigonometrical graphs •Transform graphs (including trig) - Sketch and identify translations of the graph of a given function Sketch and identify reflections of the graph of a given function •Invariant points
Half Term 5		
Date	Curriculum Overview	
WC 17/04	**Constructions (and functions)** • Understand congruence, as two shapes that are the same size and shape; • Visually identify shapes which are congruent; • Use straight edge and a pair of compasses to do standard constructions:	•Functions, composite and inverse (Opportunity to revisit rearranging here)

	• understand, from the experience of constructing them, that triangles satisfying SSS, SAS, ASA and RHS are unique, but SSA triangles are not; • construct the perpendicular bisector of a given line; • construct the perpendicular from a point to a line; • construct the bisector of a given angle; • construct angles of 90°, 45°; • Draw and construct diagrams from given instructions, including the following: • a region bounded by a circle and an intersecting line; • a given distance from a point and a given distance from a line; • equal distances from two points or two line segments; • regions may be defined by 'nearer to' or 'greater than'; Find and describe regions satisfying a combination of loci;	
WC 24/04	**Algebra 3** - •Read solutions from graphs - •Algebraic simultaneous linear equations	- Solve simultaneous equations with one quadratic - Quadratic inequalities - Iteration
WC 01/05		•Proof with vectors •Grade 8/9 - include co-linear
WC 08/05	**Vectors** - Add and subtract vectors - Multiply vectors by scalars - Simple vector calculations (eg 2a+b). - Understand and use column notation in relation to vectors; - Be able to represent information graphically given column vectors; - Identify two column vectors which are parallel; - Calculate using column vectors, and represent graphically, the sum of two vectors, the difference of two vectors and a scalar multiple of a vector.	
WC 16/05	**Similarity** - Identify similar shapes - Work out missing sides and angles in a pair given similar shapes (Use parallel line rules to work out missing angles) - Establish a pair of triangles are similar - Understand the difference between congruence and similarity - Understand and use conditions for congruent triangles	- Explore areas of similar shapes - Explore volumes of similar shapes - Solve mixed problems involving similar shapes - Prove a pair of triangles are congruent
WC 23/05		