ASHTON COMMUNITY SCIENCE COLLEGE: MATHS CURRICULUM

	Year 10 Higher Tier (1-3)					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Knowledge	Topic: • Two way tables • Frequency Trees • Rounding and Error Intervals • Accuracy and bounds(WA) • Estimation • Use of a Calculator • Product of Prime Factors, HCF and LCM • Real Life Multiples • Product rule(WA)	Topic: ▪ Fractions ▪ Recurring fraction(WA) ▪ Algebraic fractions(WA) ▪ Ratio ▪ Direct Proportion ▪ Proportion - Best Value ▪ Proportion - Recipes ▪ Proportion - Exchange Rates	Topic: ▪ Inverse Proportion ▪ Direct and inverse proportion (WA) ▪ Percentages ▪ Interest and Growth ▪ Depreciation and Decay ▪ Reverse Percentages ▪ Index Laws ▪ Fractional and negative indices (WA) ▪ Expand and Simplify ▪ Expand and factorise (WA)	Topic: ▪ Sequences ▪ Sequences including quadratics(WA) ▪ Inequalities ▪ Solving Equations ▪ Forming and Solving Equations ▪ Factorising ▪ Quadratics including the formula and iteration (WA) ▪ Subject of ▪ Rearranging equations (WA)	Topic: ▪ Standard Index Form ▪ Alternate/Corresponding Angles ▪ Interior and Exterior Angles ▪ Plans and Elevations ▪ Constructions ▪ Bearings	Topic: ▪ Pythagoras ▪ Trig - Finding Sides ▪ Trig - Finding Angles ▪ Trig - Non Calculator ▪ Pythagoras with Trig ▪ Graphs of trig functions (WA) ▪ Further trig (WA) ▪ Surds (WA) ▪ Circles,Arcs and Sectors ▪ Circle geometry (WA) ▪ Circle theorems (WA)
Skills	Two way tables - Whilst not a traditional two-way table getting students to plan a journey using bus/train timetables and distance tables provide a good precursor to the topic with a great real-life link. Frequency Trees - There are opportunities to use frequency trees to illustrate their use in medicine Rounding and Error Intervals - Students could consider the cumulative errors that arise when rounding subsequent calculations. Accuracy and bounds -This sub-unit provides many opportunities for students to evaluate their answers and provide counterarguments in mathematical and real-life contexts, in addition to requiring them to understand the implications of rounding their answers. Estimation - Questions such as: Phil states 3.44 × 10 = 34.4 and Chris states 3.44 × 10 = 34.40. Who is correct? Use of a Calculator - Questions that force students to consider the size of their expected answer deepen understanding. Product of Prime Factors, HCF and LCM - Evaluate statements and justify which answer is correct by providing a counter-argument by way of a correct solution. Real Life Multiples- Use of Venn diagrams to help find the LCM and HCF.	Fractions - Students should be able to justify when fractions are equal and provide correct answers as a counterargument. Ratio - Problems involving sharing in a ratio that include percentages rather than specific numbers, such as: In a youth club the ratio of the number of boys to the number of girls is 3 : 2. 30% of the boys are under the age of 14, and 60% of the girls are under the age of 14. What percentage of the youth club is under the age of 14? Direct Proportion -Speed/distance type problems that involve students justifying their reasons why one vehicle is faster than another. Proportion - Calculations involving value for money are a good reasoning opportunity that utilise different skills.	Direct and inverse proportion -Justify and infer relationships in real-life scenarios to direct and inverse proportion such as ice cream sales and sunshine. Percentages - Sale prices offer an ideal opportunity for solving problems allowing students the opportunity to investigate the most effective way to work out the "sale" price. Interest and Growth/Depreciation and Decay - Calculations involving value for money are a good reasoning opportunity that utilise different skills. Reverse Percentages - Calculate original values and evaluate statements in relation to this value justifying which statement is correct. Index Laws -Problems that use indices instead of integers will provide rich opportunities to apply the knowledge in this unit in other areas of Mathematics. Fractional and negative indices -Problems that use indices instead of integers will provide rich opportunities to apply the knowledge in this unit in other areas of Mathematics. Expand and Simplify - Use of algebra tiles/discs. Expand and factorise - Evaluate statements and justify which answer is correct by providing a counter-argument by way of a correct solution.	Sequences - Evaluating statements about whether or not specific numbers or patterns are in a sequence and justifying the reasons. Sequences including quadratics - Evaluate statements about whether or not specific numbers or patterns are in a sequence and justify the reasons. Solving Equations - Forming and solving equations involving algebra and other areas of mathematics such as area and perimeter. Forming and Solving Equations - Problems that could be solved by forming equations such as: Pat and Paul have a combined salary of £800 per week. Pat earns £200 per week more than Paul. How much does Paul earn?	Standard Index Form - Link with other areas of mathematics, such as compound measures, by using speed of light in standard form. Alternate/Corresponding Angles -Multi-step "angle chasing" style problems that involve justifying how students have found a specific angle. Interior and Exterior Angles - Problems whereby students have to justify the number of sides that a regular polygon has given an interior or exterior angle. Constructions - Link problems with other areas of mathematics, such as the trigonometric ratios and Pythagoras' Theorem. Bearings - Interpreting scale drawings and maps involving lengths that need to be measured (rather than given in the problem).	Pythagoras/Trig - Combined triangle problems that involve consecutive application of Pythagoras' Theorem or a combination of Pythagoras' Theorem and the trigonometric ratios. Graphs of trig functions -Match a given list of events/processes with their graph, calculate and justify specific coordinates on a transformation of a trigonometric function. Further trig -Triangles formed in a semi-circle can provide links with other areas of mathematics. Surds -Links with other areas of Mathematics can be made by using surds in Pythagoras and when using trigonometric ratios. Circles,Arcs and Sectors -Know the impact of estimating their answers and whether it is an overestimate or underestimate in relation to a given context. Circle geometry - Justify if a straight-line graph would pass through a circle drawn on a coordinate grid. Circle theorems- Problems that involve a clear chain of reasoning and provide counter-arguments to statements. Can be linked to other areas of mathematics by incorporating trigonometry and Pythagoras' Theorem.
Links to prior learning	Two Way Tables - Basic addition and subtraction, probability Frequency Trees – Basic addition and subtraction, probability Rounding and Error Intervals- place value, rounding and inequality symbols Accuracy and bounds Substituting numbers and using inequality notation Estimation - rounding Use of Calculator - written and mental methods and BIDMAS Product of Prime Factors HCF & LCM - factors, multiples, prime numbers, Venn diagrams and powers Real Life Multiples – factors and product of prime factors Product rule - Multiply or divide by any number between 0 and 1	Fractions – Express a given number as a fraction of another, simplifying, fraction of a quantity, convert between mixed and improper Recurring fractions - Add, subtract, multiply and divide fractions Algebraic fractions - Simplify surds, use negative numbers with all four operations, recall and use the hierarchy of operations. Ratio – four operations of number Direct Proportion – four operations, fractions as parts of a whole, conversion between metric units Proportion– four operations, divide money, rounding, converting metric units, fractions as parts of a whole	Inverse Proportion -four operations, fractions, metric units, direct proportion. Direct and inverse proportion - draw linear and quadratic graphs, writing statements of direct proportion and forming an equation. Percentages - four operations, percentages, multiplication tables. Interest, Growth, Depreciation and Decay – percentages, decimals Reverse Percentages - percentages Index Laws - powers of 10, negative numbers, four operations, BIDMAS , inverse operations. Fractional and negative indices - Use index laws to simplify and calculate the value of numerical and algebraic expressions Expand and Simplify - negative numbers, substitution, coordinates	Sequences - negative numbers, use of calculator, index laws Sequences including quadratics - Find and use the nth term of an arithmetic sequence Inequalities – inequality signs, number line Solving Equations – inequality sign, substitution, negative numbers, four operations, BIDMAS, inverse operations Forming and Solving Equations - solve linear equations, Factorising - expanding brackets, collecting 'like' terms Quadratics including the formula and iteration - substitute into, solve and rearrange linear equations, factorise quadratic expressions Subject of – substitution, using formulae BIDMAS and inequalities Rearranging equations - change the subject of a formula	Standard Index Form - powers of 10 in index form Alternate/Corresponding angles – angles as a measure of turn, angle sum of a triangle/quadrilateral Interior and Exterior Angles - use ruler and protractor, angles, reflection and symmetry, polygons Plans and Elevations - draw circles and arcs, measure and draw lines and angles, compass directions, sketches of 3D solids, faces, edge, vertices, planes of symmetry, constructing rectangles, triangles, perpendicular and parallel lines. Constructions - measure and draw lines, using pairs of compasses Bearings - measure and draw lines and angles	Pythagoras and Trig - Rearrange formulae and equations, basic angle facts, surd form, coordinates Graphs of trig functions/further trig - Use axes and coordinates to specify points in all four quadrants, recall and apply Pythagoras' Theorem and trigonometric ratios, substitute into formulae. Surds - Use negative numbers with all four operations, recall and use the hierarchy of operations. Circles, Arcs and Sectors - area of a rectangle, use of a calculator. Circle geometry/circle theorems - drawing circles with compasses, recall the words, centre, radius, diameter and circumference, relationship of the gradient between two perpendicular lines, find the equation of the straight line.
assessment	Check ins Check outs	Check ins Check outs Year 10 Data Capture 1	Check ins Check out	Check ins Check out	Check ins Check outs Year 10 Data Capture 2	Check ins Check outs

ASHTON COMMUNITY SCIENCE COLLEGE: MATHS CURRICULUM

	Year 11 Higher (sets 1-3)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge	Topic: • Surface Area and Volume • Surface area & volume - cylinders, cones, spheres & frustums (WA) • Sampling • Sampling (WA) • Averages • Averages from a Table • Averages from Grouped Data • Frequency Diagrams • Scatter Graphs	Topic: • Time Series • Pie Charts • Cumulative frequency and box plots (WA) • Histograms (WA) • Coordinate Geometry • Coordinate Geometry – linear graphs/non-linear graphs/circle geometry (WA) • Straight Line Graphs • Non-linear Graphs • Using graphs of circles, cubes and quadratics (WA) • Speed, Distance, Time • Compound Measures	Topic: • Real Life Graphs • Congruence • Similar Shapes • Similarity in 2D & 3D (WA) • Congruence and geometric proof (WA) • Reflections • Rotations • Translations • Enlargements • Combined Transformations • Transformations (WA)	Topic: • Vectors • Vectors (WA) • Probability from a Table • Probability Trees • Conditional probability (WA) • Venn Diagrams • Simultaneous Equations • Simultaneous equations (WA) • Gradient and area under a curve (WA) • Functions (WA) • Algebraic proof (WA)	Topic: • Past Papers/QLA	Topic: • Exams
Skills/ application of knowledge	Surface Area and Volume -Combinations of 3D forms such as a cone and a sphere where the radius has to be calculated given the total height. Surface area & volume - cylinders, cones, spheres & frustums -Multi-step problems, including the requirement to form and solve equations, provide links with other areas of mathematics. Sampling - When using a sample of a population to solve contextual problem, students should be able to justify why the sample may not be representative of the whole Averages - Given the mean, median and mode of five positive whole numbers, can you find the numbers? Frequency Diagrams - Evaluate statements in relation to data displayed in a graph/chart. Scatter Graphs - Many real-life situations that give rise to two variables provide opportunities for students to extrapolate and interpret the resulting relationship (if any) between the variables.	Time Series - Evaluate statements in relation to data displayed in a graph/chart. Pie Charts - Explain why same-size sectors on pie charts with different data sets do not represent the same number of items but do represent the same proportion. Cumulative frequency and box plots -Interpret two or more data sets from box plots and relate the key measures in the context of the data. Given the size of a sample and its box plot calculate the proportion above/below a specified value. Coordinate Geometry (linear graphs/non-linear graphs/circle geometry) Given an equation of a line provide a counter argument as to whether or not another equation of a line is parallel or perpendicular to the first line. Straight Line Graphs - Students should be able to decide what the scales on any axis should in order to draw a correct graph. Non-linear Graphs - Matching graphs with their respective functions. Using graphs of circles, cubes and quadratics - Match equations to their graphs and to real-life scenarios, "Show that"-type questions will allow students to show a logical and clear chain of reasoning Speed, Distance, Time/Compound measures - Speed/distance type problems that involve students justifying their reasons why one vehicle is faster than another.	Real Life Graphs - Students should be able to decide what the scales on any axis should be to be able to draw a correct graph. Congruence/similarity - Using scale diagrams, including bearings and maps, provides a rich source of real-life examples and links to other areas of mathematics. Similarity in 2D & 3D - Multi-step questions which require calculating missing lengths of similar shapes prior to calculating area of the shape, or using this information in trigonometry or Pythagoras problems. Congruence and geometric proof - Formal proof is an ideal opportunity for students to provide a clear logical chain of reasoning providing links with other areas of mathematics. Transformations - Students should be given the opportunity to explore the effect of reflecting in two parallel mirror lines and combining transformations.	Vectors - Investigations involving vectors around 2D shapes such as a square can be extended to include considering the area enclosed in the same shapes. Vectors - "Show that"-type questions are an ideal opportunity for students to provide a clear logical chain of reasoning. Probability from a Table -Students should be given the opportunity to justify the probability of events happening or not happening. Probability Trees - Lotteries provides a real-life link to probability.. Conditional probability - Students should be given the opportunity to justify the probability of events happening or not happening in real-life and abstract contexts. Venn Diagrams -Use examples that include ratio, percentages or algebraic terms. Simultaneous Equations - real life scenarios, such as 2 adult and 2 child tickets cost £18, and 1 adult and 3 child tickets costs £17. What is the cost of 1 adult ticket? Simultaneous equations - Problems that require student to justify why certain values in a solution can be ignored. Gradient and area under a curve- Interpreting many of these graphs in relation to their specific contexts. Algebraic proof - Formal proof is an ideal opportunity for students to provide a clear logical chain of reasoning.		
Links to prior learning	Surface area and volume - area of a rectangle, use of a calculator, measure lines, 2D shapes, powers of 10, areas and volumes, scales. Surface area & volume - cylinders, cones, spheres & frustums – much of this unit is built upon area and volume from the crossover units but develops further to include forming and solving equations in this context. Sampling - midpoints, inequality notation. Sampling - samples, populations, sample sizes and reliability. Averages – midpoints, inequality notation. Averages from a table and grouped data - tally charts, inequality notation, midpoints, time. Frequency Diagrams - read scales, plot coordinates, tally charts, stem and leaf, inequality notation, midpoints. Scatter graphs - Read scale, plot coordinates, tally charts.	Time Series - Read scales, coordinates, tally charts. Pie Charts - read scales, draw circles, measure angles, coordinates, angles in a full turn, at a point and on a straight line. Cumulative frequency/box plots/histograms - inequality notation, multiply a fraction by a number Coordinate Geometry - plot coordinates, read scales, substitution. Coordinate Geometry (linear graphs/non-linear graphs/circle geometry) - Pythagoras' Theorem, area of compound shapes, straight-line graphs for real-life situations, midpoint of a line. Straight Line Graphs - plot coordinates, read scales, substitution. Non-linear Graphs -negative numbers, substitution, plot coordinates, expand brackets, collect 'like' terms. Using graphs of circles, cubes and quadratics - Solve equations algebraically, craw linear and quadratic graphs, sketch reciprocal graphs Speed, Distance, Time and compound measures - interpret scales, percentage of an amount, percentages to decimals, rearrange equations, metric units, area and volume of shapes, s = d/t, d=m/v	Real Life Graphs - plot coordinates, read scales, substitution Congruence and similarity – enlarge shapes and scale factors, area and volume in metric measures. Similarity in 2D & 3D - enlarge shapes and calculate scale factors, area and volume in various metric measures, identify similar shapes. Congruence and geometric proof - congruence criteria for triangles (SSS, SAS, ASA and RHS), understand congruence, as two shapes that are the same size and shape and visually identify shapes which are congruent, prove that two shapes are similar. Transformations - 2D shapes, plot points , rotations, draw and recognise lines parallel to axes and y = x, y = –x, congruent shapes Transformations - recognise 2D shapes. Plot coordinates and linear equations parallel to the coordinate axes, enlarge, rotate, reflect and translate given shapes and also be able to describe transformations.	Vectors - column vectors, Pythagoras' Theorem on a coordinate grid. Vectors - vectors, Pythagoras' Theorem, properties of triangles and quadrilaterals, column vector arithmetic. Probability from a Table/Trees - add and multiply fractions and decimals, expressing one number as a fraction of another number. Conditional probability –probability trees, two way tables and venn diagrams Venn Diagrams - Basic addition and subtraction, probability is a number between 0 and 1. Simultaneous Equations - set up and solve linear equations. Simultaneous equations - linear equations. factorise quadratic expressions, inequalities on number lines, solve simple linear inequalities, Gradient and area under a curve - gradient of a linear function Functions - Simplify surds, negative numbers , hierarchy of operations. Algebraic proof - Expand expressions, solve linear and quadratic equations.		
assessment	Check ins Check outs Year 11 Data Capture 1	Check ins Check outs	Check ins Check outs Year 11 Data Capture	Check ins Check outs		