

Year 9 Curriculum Overview

Mathematics -The Copley mathematics curriculum has 6 NC Areas and 22 strands that are woven through the curriculum from Year 7 to Year 11

NC Subject Content Area	Strands
Number	 Number: Understand and represent number Number: Calculations Number: Understand fractions and decimals Number: Percentages
Algebra	 Algebra: Understand Notation and Substitute Algebra: Equivalence and Proof Algebra: Solve Equations and Inequalities Algebra: Linear Graphs Algebra: Non-linear Graphs Algebra: Sequences
Ratio, proportion and rates of change	 Ratio, Proportion, Rates of Change: Multiplicative Relationships Ratio, Proportion, Rates of Change: Ratio & Rates
Geometry and measures	 Geometry and Measures: Perimeter, Area and Volume Geometry and Measures: Construct and Transform Geometric Figures Geometry and Measures: Shape properties Geometry and Measures: Angles Geometry and Measures: Pythagoras and Trigonometry Geometry : Geometrical Proof
Probability	• Probability
Statistics	 Statistics: Represent and Interpret Data Statistics: Statistical Measures Statistics: Bivariate Data



Year 9		HT1	HT2	НТЗ	HT4	HT5	HT6			
	Торіс	Topic Reasoning with Algebra Constructing in 2 and 3 Dimensions by this and why Straight Line Graphs Three Dimensional Shapes Ni		Reasoning with Number	Reasoning with Geometry	Reasoning with Proportion	Representations			
Mathematics	Why this and why now?	Straight Line Graphs Pupils will be familiar with horizontal and vertical lines. This units looks at gradients and y – intercept and formalize y = mx + c. Students will be introduced to perpendicular and parallel line. This work is important for future learning when pupils are taught to equate lines and curves and use the properties of lines to solve problems with and without diagrams. Forming and Solving equations and Inequalities Pupils have already spent time solving linear equations and learning the basic algebraic rules. This unit looks at the similarities and differences for solving equations and inequalities. The pupils need a solid grasp of solving linear equations and inequalities. This work moves towards solving quadratic equations and inequalities at KS4. Testing Conjectures Pupils will have tested conjectures in Year 8 and 9. This unit looks to formalize this process into a proper mathematical structure. For GCSE pupils will have to prove geometrically and algebraically. Testing conjectures is an excellent introduction into this area.	Three Dimensional Shapes Pupils will be confident with working with 2D shapes and their areas. This block of work extends into 3D shapes. Pupils will work on surface areas, volumes and nets of the shapes. Pupils will in future use Pythagoras and trigonometry to further extend their work with 3D shapes. Constructions and Congruency Pupils will be familiar with using a compass, protractor and ruler when they drew accurate triangle diagrams. They will learn further how to use these mathematical instruments with a wide variety of constructions. They will also be introduced to basic congruency. These skills will be further developed when pupils have to formalize geometric proofs. They will also build their skills at applying constructions into contextualized questions.	Numbers The majority of the topics in this block have been covered earlier in KS3. This is another opportunity to secure basic numeracy skills. The number section is important for a range of topics at KS4. It is important that these skills are well embedded at KS3 so pupils can tackle more in-depth questions at KS4. Using Percentages The majority of the topics in this block have been covered earlier in KS3. This is another opportunity to secure basic numeracy skills. In this unit pupils will also look at repeated percentages. It is really important that they and confident to use a decimal multiplier when working out percentage questions. Pupils will expand their work on compound interest looking at repeating calculations with different multipliers and also reversing the calculation to find the decimal multiplier and percentage equivalent. Mathematics and Money This unit using number and percentage but puts it into a context for money life skills that the pupils will need in future. This will help pupils manage their financial arrangements in future.	Deduction This topic builds on the work on angle in Year 7 and 8. Pupils are asked to make conjectures and then check to see if they work in a variety of geometric contexts. This work is crucial as it leads into circle theorem work and eventually having to prove some of the circle theorems. Rotation and translation Pupils will have rotated shapes before. This unit formalizes the need for rotation around a point and using 4 quadrant coordinate diagrams. Pupils should start to use translations vectors for translations on 4 quadrant coordinate diagrams. The rotation works is not really built upon until A level but the translation of functions at GCSE. Pythagoras' Theorem This is a new topic although pupils will be familiar with right angled triangles, squares and square roots. This unit enables the pupils to find the length on an unknown side of a right-angled triangle. There is scope to look at 3D shapes but this is explored in greater detail at KS4. Pupils will use the techniques learnt at KS3 to further build their skills with 2D problem solving and move onto 3D	Enlargement and similarity Pupils will be familiar with basic enlargement of shape. This unit aims to deepen this area looking at fractional and negative enlargements about a point. They will also learn how to find missing sides on shapes if shapes are similar using scale factors. The enlargement unit will be repeated at GCSE but the skills don't really increase. It will be an opportunity to further embed these skills. Similarity work will be increased when students have to prove congruence and also look at connections between scale, area and volume factors. Solving Ratio and Proportion Problems Pupils will have solved problems at primary and KS3 using proportion and the unitary method. This unit looks again at these problems but also explores what is happening graphically. Pupils build on earlier work on ratio and start to problem solve by split amounts by a ratio. This work will lead to formal methods when finding direct and inverse proportion at KS4. Pupils will also develop ratio techniques using algebraic methods, two-way tables and tree diagrams.	 Probability Pupils will be used to finding probabilities of single events. This unit expands on this with multiple events using twoway tables and tree diagram probability. This will lead to pupils being competent in the future with tree diagram probability to look at dependent events and algebraic probability. Algebraic Representations Pupils will be confident at plotting and understanding straight line graphs and y = mx + c. This unit moves onto quadratic graphs, the importance of the intersection of simultaneous equations and piece-wise graphs. Pupils will look at quadratic graphs in more detail at KS4. Work will include completing the square and turning points and solving quadratics for the intersections point with the x – axis. Pupils might even go onto look at the discriminate and its effect on a quadratic 			

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			This unit will be revisited at KS4 to ensure that pupils leave school confident with money. The exam has limited testing on this area but we should try to ensure that young people are confident with numerical and financial calculations.	shapes. The distance formula can also be introduced at GCSE higher level.	Pupils will be used to using formula with area etc. They will now look at SDT and DMV and other rate questions. This unit will look at the connection between the variables as well as using the formulae. This work will eventually lead to working out gradients of straight lines and tangents to curves at GCSE. A pre-cursor to calculus at A level				
What is the essential knowledge that needs to be remembered?	Straight Line Graphs Lines parallel to the axes, y = x and y =-x (R) Using tables of values (R) Compare gradients Compare intercept Understand and use y = mx + c Write an equation in the form y = mx + c (H) Find the equation of a line from a graph Interpret gradients and intercepts of real-life graphs Model real-life graphs involving inverse proportion (H) Forming and Solving equations and inequalities Solve one and two step equations and inequalities solve one and two step equations and inequalities Solve equations with negative numbers Solve equations with unknowns on both sides Solve inequalities with	Three Dimensional Shapes Know the names of 2-D and 3-D shapes Recognise prisms Accurate nets of cuboids and other 3-D shapes Sketch and recognize nets of cuboids and other 3-D shapes Plans and elevations Find area of 2-D shapes (R) Surface area of cubes and cuboids Surface area of cubes and cuboid Surface area of triangular prisms Surface area of triangular prisms and cylinder Volume of cubes and cuboids Volume of other 3-D shapes, prisms and cylinders Explore volumes of cones, pyramids and spheres (H) Constructions and Congruency Draw and measure angles (R) Construct and interpret scale drawings (R) Locus of distance from a point Locus of distance from a straight line/shape Locus equidistant from two point	Numbers Integers, real and rational numbers Understand and use surds (H) Work with directed number (R) Solve problems with integers Solve problems with decimals HCF and LCM (R) Adding and subtracting fractions (R) Multiplying and dividing fractions (R) Solving problems with fractions Numbers in standard form (R) Using Percentages Use the equivalence of fractions, decimals and percentages (R) Calculate percentage increase and decrease (R) Express a change as a percentage (R) Solve "reverse" percentage problems Recognise and solve percentage problems (non – calculator) Recognise and solve percentage problems (calculator) (R) Solve problems with repeated	Deduction Angles in parallel lines (R) Solving angles problems (using chains of reasoning) Angles problems with algebra Conjectures with angles Conjectures with angles Conjectures with angles Conjectures with shapes Link constructions and geometrical reasoning (H) Rotation and translation Identify the order of rotational symmetry of a shape Compare and contrast rotational symmetry with line symmetry Rotate a shape about a point on a shape Translate points and shapes by a given vector Compare rotation and reflection of shapes Find the result of a series of transformations (H) Pythagoras' Theorem Squares and square roots (R) Identify the hypotenuse of a right-angled Determine whether a triangle	Enlargement and similarity. Recognise enlargement and similarity Enlarge a shape by a positive integer scale factor Enlarge a shape by a positive integer scale factor from a point Enlarge a shape by a positive fractional scale factor Enlarge a shape by a negative scale factor (H) Work out missing sides and angles in a pair of given similar shapes Solve problems with similar triangles (H) Explore ratios in right-angled triangles (H) Solving Ratio and Proportion Problems. Solve problems with direct proportion (R) Direct proportion and conversion graphs (R) Solve problems with inverse proportion Graphs of inverse relationships (H) Solve ratio problems given the whole or a part (R) Solve "best buy" problems	Probability Single event probability (R) Relative frequency – include convergence Expected outcomes Independent events Use tree diagrams to solve "without replacement" problems (H) Use diagrams to work out probabilities <u>Algebraic Representations</u> Draw and interpret quadratic graphs Interpret graphs, including reciprocal and piece-wise Investigate graphs of simultaneous equations (H) Represent inequalities			
	Solve equations and inequalities in context Substituting into formulae and equations Rearrange formulae (one- step)	points Construct a perpendicular bisector Construct a perpendicular from a point	Solve problems with repeated percentage change (H) <u>Mathematics and Money</u> Solve problems with bills and bank statements	is right-angled Calculate the hypotenuse of a right-angled triangle Calculate missing sides in right angled triangles	Solve problems ratio and algebra (H) <u>Rates</u>				

	step) Rearrange complex formula including bracket and squares (H) <u>Testing Conjectures</u> Factors, Multiples and Primes True or False? Always, Sometimes, Never true Show that Conjecture about number Expand a pair of binomials Conjectures with algebra Explore the 100 grid	a point Locus of distance from two lines Construct an angle bisector Construct triangles from given information (R) Identify congruent figures Explore congruent triangles Identify congruent triangles	Calculate simple interest Calculate compound interest Solve problems with Value Added Tax Calculate wages and taxes Solve problems with exchange rates Solve unit pricing problems	Use Pythagoras theorem on coordinate axes Explore proofs of Pythagoras' theorem Use Pythagoras' theorem in 3-D shapes (H)	Solve speed, distance and time problems without a calculator Solve speed, distance and time problems with a calculator Use distance/time graphs Solve problems with density, mass and volume Solve flow problems and their graphs Rates of change and their units Convert compound units (H)	
What is the assessment intent and how will you assess? What should the end point look like?	Each block of work is assessed to This pattern can be seen at the Teachers check the progress an Blocks are also assessed at the Pupils need to have fully embedded this topic and by confident with straight lines and in real life contexts. Pupils will be confident solving equations and use these skills to rearrange formulae. Pupils will start to make conjectures which will be helpful for proof work in the future.	using the WRM assessment. Durin end of this document. d areas of concern are addressed end of each term to check progres Pupils will be able to find surface areas and volumes of 3D shapes as well as having a detailed knowledge about each shape. The pupils will also look at constructions using, a pair of compasses, protractor and ruler. Pupils should be able to draw accurate geometric constructions.	g this assessment "Can you still" to through whole class teaching with sand establish if long term learni Pupils will be able to revise number and percentage which will increase their confidence. Any gaps in learning should be closed as well as applying number to real life money problems.	blocks are also assessed. h targeted Do Nows and HW. ing has been secured. Pupils should be competent with angles in parallel lines. They will also use prior angle knowledge to solve extended problems. Pupils will rotate and translate shapes using formal and informal methods. Pupils will be able to find missing sides on right angled triangles.	Rates / Ratio and proportion s now a separate unit within the GCSE mathematics curriculum with its importance being elevated after the last GCSE curriculum changes. Pupils should be able to link diagrammatically and formal methods together. They should also understand SDT and DMV as rates of change and not just apply formulae.	The pupils should be confident of finding the probability of 2 events both independent or dependent. They will also have a greater understanding of graphical solutions to problems that they have solved algebraically in the past.



Year 9 Assessment Matrix

Year 9	Straight line graphs	Forming and solving equations	Testing conjectures	3D Shapes	Constructions and congruency	Numbers	Using percentages	Maths and money	Deduction	Rotation and Translation	Pythagoras' Theorem	Enlargement and Similarity	Ratio and proportion	Rates	Probability	Algebraic representation
Straight line graphs																
Forming and solving equations																
Testing conjectures																
3D Shapes																
End of Term CORE test																
Constructions and congruency																
Numbers																
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End of Term CORE test																
Pythagoras' Theorem																
Enlargement and Similarity																
Ratio and proportion																
Rates																
Probability																
Algebraic representation																
End of Year CORE test							TBC	uhen ur	ritton b;	WRM						
			E	Block	k Te	st										
			Са	n Yo	ou St	ill?'										
	End of term CORE test															