Year 7 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 7	HT1	HT2	HT3	HT4	HT5	HT6
Topic	Algebraic Thinking	Place Value & Proportion	Applications of Number	Directed Number & Fractional Thinking	Lines & Angles	Reasoning with Number

Mathematics

Why this and why now?

Sequences
Pupils will be used to spotting and developing patterns from primary. This is continued in this unit before developing more formal methods to find the nth term rules. This topic helps to build the idea of linear sequence which is used with equation of a straight line and proportion. The pupils will also use this topic later when they develop techniques with quadratic sequences.

Algebraic Notation
Pupils use their knowledge of function machines from primary to develop algebraic skills in this area. This unit of work is the building block for many units of work as the pupils develop their algebraic skills through their education. Algebra plays a key part especially in the Higher mathematics curriculum.

Equalities and Equivalence
The pupils further develop the use of the equals sign and start to solve basic equations. The equivalence sign is also introduced as a new symbol at this stage. Solving basic equations is a building block for numerous topics. It is also an area that is used across different topic areas especially for problem solving and finding unknowns.

Place value and ordering integers and decimals
The majority of this material builds on what is taught at primary school. This is an excellent opportunity to secure knowledge and fill in gaps with prior learning. There will be an opportunity to extend pupil knowledge through standard form.

This topic is again a building block for many future topics. Pupils being fluent is basic numeracy is important for all future topics as well as having basic skills for life.

Fraction, decimal and percentage equivalence
Again, this topic allows for further depth of material taught at primary. The decimal topic taught previously can be explored in more depth.

Each of these areas is developed in more detail. Many topic areas require fluency in these basic skills. These skills are also essential for A level and calculus.

Solving problems with addition and subtraction
This material builds on what is taught at primary school. This is an excellent opportunity to secure knowledge and fill in gaps with prior learning. There will be an opportunity to extend pupil knowledge through more complex standard form calculations.
This work is further extended in spring term 2 as well as being a basic building block for the entire maths curriculum.

Solving problems with multiplication and division
Again, this topic allows for further depth of material taught at primary. Problems involving trapezia and some algebraic manipulation will also be covered in this topic
This work is further extended in spring term 2 and Yr8 Autumn 1 as well as being a basic building block for the entire maths curriculum

Fractions and percentages of amounts
Again, this topic allows for further depth of material taught at primary. The pupils will further extend their knowledge by looking at fractions and percentages greater than 1.
This unit of work is further extended in Year 8 Autumn 2.

Directed number
This material builds on what is taught at primary school. This is an excellent opportunity to secure knowledge and fill in gaps with prior learning. There will be an opportunity to extend pupil knowledge through looking at solutions to square roots and exploring higher powers and roots.
This topic is crucial as a building block for numerous future topics. The pupils have to be fluent with directed number as they attempt more difficult topics in mathematics. (Directed number often causes confusion as it has not been fully understood)

Fractional Thinking
This material builds on what is taught at primary school. This is an excellent opportunity to secure knowledge and fill in gaps with prior learning. There will be an opportunity to extend pupil knowledge through looking at mixed number fractions and extending further to algebraic fractions

Again, this topic is crucial as pupils move forward with their mathematics. They need to be fluent with their fraction skills to order to access algebraic manipulation in future years as well as

Constructing, measuring and using geometric notation
The pupils will have had limited experience of this topic at primary. It is therefore important to embed these skills at an early stage.
This topic is crucial for future geometry work. This topic leads into loci and bearings.

Geometric Reasoning
Pupils will have a basic understanding of triangles and most quadrilaterals but this learning will be supplemented with properties of shapes up to a decagon. Pupils will also become fluent with angles in parallel lines.
Pupils have to be fluent with the geometric reasoning as they build skills throughout their schooling. This is important later for circle theorem and geometric proof work

Developing number sense
Pupils have been taught a number of techniques for numeracy. This topic looks at when best to apply certain techniques. Pupils need to develop a "feel" for mathematics to apply the correct method at the correct time.
This is a basic building block for numerous topics in the curriculum moving forward and is crucial especially for pupils who study the foundation course at GCSE.

Sets and probability
Pupils will develop their use of sets and probability in this topic. This will be predominately new learning. This is a crucial topic for HCF and LCM work. As we progress through the curriculum more notation will be developed and use of Venn diagrams with more complexity.

Prime numbers and Proof
This unit develops work from primary and builds on the work in the previous unit. This work will help to develop skills for future work on algebraic proof and number sense.

What is the essential knowledge that needs to be remembered?	Sequences	Place value and ordering integers and decimals	Solving problems with addition and subtraction.	Directed number.	Constructing, measuring and using geometric notation	Developing number sense

Sequences
Represent sequences in tables and graphs
Recognise the difference between linear and non-linear sequences.
Explain term-to-term rules in words.

Algebraic Notation
Use inverse operations to find the input given the output
Use diagrams and letters with 2 functions machines
Find the function machines given a 2-step expression
Generate sequences given an algebraic rule
Represent 1 and 2 step functions graphically

Equalities and Equivalence
Solve 1 step linear equations involving + / - x / ÷ inverse operations
Understand the meaning of like and unlike terms
Understand the meaning of equivalence by simplifying algebraic expressions by collecting like terms and using the equivalence symbol ≡

Place value and ordering integers and decimals
Recognise the place value of any number in an integer up to one billion
Understand and write integers up to one billion in words and figures
Work out intervals on a number line
Position integers on a number line
Round integers to the nearest power of ten
Compare 2 numbers using =, ≠, <, >, ≤, ≥
Order a list of integers
Find the range of a set of numbers
Find the median of a set of numbers
Understand place value for decimals
Position decimals on a number line
Compare and order any number up to 1 billion
Round a number to 1 Standard Form (H)

Fraction, decimal and percentage equivalence

Represent tenths and hundredths as diagrams
Represent tenths and hundredths on number lines
Interchange between fractional and decimal number lines
Convert between fractions and decimals – tenths & hundredths
Convert between fractions and decimals – eights and & thousandths (H)

Solving problems with addition and subtraction.
Properties of addition and subtraction
Mental strategies for addition and subtraction
Use formal methods for addition of integers
Use formal methods for addition of decimals
Use formal methods for subtraction of integers
Use formal methods for subtraction of decimals
Choose the most appropriate method: mental strategies, formal written or calculator
Solve problems in the context of perimeter
Solve financial maths problems
Solve problems involving tables and timetables
Solve problems with frequency trees
Solve problems with bar charts and line charts

Solving problems with multiplication and division.
Properties of multiplication and division
Understand and use factors
Understand and use multiples
Multiply and divide integers and decimals by powers of 10
Multiply by 0.1 and 0.01 (H)
Convert metric units
Use formal methods to multiply integers
Use formal methods to multiply decimals
Use formal methods to divide integers
Use formal methods to divide decimals
Understand and use order of operations

Directed number.
Understand and use representations of directed numbers
Order directed numbers using lines and appropriate symbols
Perform calculations that cross zero
Add directed numbers
Subtract directed numbers
Multiplication of directed numbers
Multiplication and division of directed numbers
Use a calculator for directed number calculations
Evaluate algebraic expressions with directed number
Introduction to two step equations
Solve two-step equations
Use order of operations with directed numbers
Understand that positive numbers have more than one

Fractional Thinking.
Understand representations of fractions
Convert between mixed numbers and fractions
Add and subtract unit fractions with the same denominator
Add and subtract fractions with the same denominator
Add and subtract fractions from integers expressing the answer as a single fraction
Understand and use equivalent fractions
Add and subtract fractions where denominators share a simple common multiple.
Add and subtract fractions with any denominator

Constructing, measuring and using geometric notation
Understand and use letter and labelling conventions including those for geometric figures
Draw and measure line segments including geometric figures
Understand angles as a measure of turn
Classify angles
Measure angles up to 180 degrees
Draw angles up to 180 degrees
Draw and measure angles between 180 and 360.
Identify perpendicular and parallel lines
Recognise types of triangle
Recognise types of quadrilateral
Identify polygons up to a decagon
Construct triangles SSS
Construct triangles using SSS, SAS, ASA
Construct more complex polygons
Interpret simple pie charts using proportion
Interpret pie charts using a protractor
Draw pie charts

Geometric Reasoning
Understand and use the sum of angles at a point
Understand and use the sum of angles on a straight line
Understand and use the equality of vertically opposite angles
Know and apply the sum of angles in a triangle
Know and apply the sum of angles in a quadrilateral

Developing number sense
Know and use mental addition and subtraction strategies for integers
Know and use mental multiplication and division strategies for integers
Know and use mental arithmetic strategies for decimals
Know and use mental arithmetic strategies for fractions
Use factors to simplify calculations
Use estimation as a method for checking mental calculations
Use know number facts to derive other facts
Use know algebraic facts to derive other facts
Know when to use a mental strategy, formal written method or a calculator

Sets and probability
Identify and represent sets
Interpret and create Venn diagrams
Understand and use the intersection of sets
Understand and use the union of sets
Understand and use the complement of a set (H)
Know and use the vocabulary of probability
Generate sample spaces for single events
Calculate the probability of a single event
Understand and use the probability scale
Know that the sum of probabilities of all possible outcomes is 1

Prime numbers and Proof
Find and use multiples

			Understand the meaning of percentage using a hundred square Convert fluently between simple fractions, decimals and percentages Use and interpret pie charts Represent any fraction as a diagram Represent fractions on number lines Identify and use simple equivalent fractions Understand fractions as division Convert fluently between fractions, decimals and percentages Explore fractions above 1, decimals and percentages	Solve problems using the area of rectangles and parallelograms Solve problems using the area of triangles **Fractions and percentages of amounts** Find a fraction of a given amount Use a give fraction to find the whole or other fractions Find the percentage of a given amount using mental methods Find the percentage of a given amount using a calculator	Add and subtract improper fractions and mixed numbers Use fractions in algebraic contexts Use equivalence to add and subtract decimals and fractions Add and subtract simple algebraic fractions (H)	Solve angle problems using properties of triangles and quadrilaterals Solve complex angle problems Find and use the angle sum of any polygon (H) Investigate angles in parallel lines (H) Understand and use parallel line angle rules Use known facts to obtain simple proofs	Identify factors of numbers and expressions Recognise and identify prime numbers Recognise square and triangular numbers Find common factors of a set of numbers including the HCF Find common multiples of a set of numbers including the LCM Write a number as a product of its prime factors Use a Venn diagram to calculate the HCF and LCM (H) Make and test conjectures Use counterexamples to disprove a conjecture
What is the assessment intent and how will you assess?	Each block of work is assessed using the WRM assessment. During this assessment "Can you still" blocks are also assessed. This pattern can be seen at the end of this document. Teachers check the progress and areas of concern are addressed through whole class teaching with targeted Do Nows and HW. Blocks are also assessed at the end of each term to check progress and establish if long term learning has been secured.					
What should the end point look like?	Pupils need to secure their learning in the key areas listed above. This will enable them to progress in the next unit of algebra if these key skills have been secured in long term learning.	Pupils will be confident in areas of numeracy and be fluent with FDP. Assessment will show current performance. This will be further assessed in the future with "Can you still" questions showing learning embedded into long term learning.	Pupils will be secure and fluent with the 4 basic operations in mathematics as well as having a good grasp of fraction and percentage calculations. Assessment will show current performance. This will be further assessed in the future with "Can you still" questions showing learning embedded into long term learning.	Pupils will be secure at using directed numbers in various contexts including algebra. Fractional work will be extended to ensure pupils are confident with mixed numbers and not just vulgar fractions. Assessment will show current performance. This will be further assessed in the future with "Can you still" questions showing learning embedded into long term learning.	Pupils should be confident with labelling and measuring angle work at the end of this half term. They will also be confident using appropriate mathematics instruments to draw and measure geometric shapes and their properties.	Pupils will be able to understand number at a higher level. Their vocabulary will also increase to understand different types of number.
How does it cover the NC?	The NC coverage can be found on page 14. PowerPoint Presentation (kxcdn.com)	The NC coverage can be found on page 5-8. PowerPoint Presentation (kxcdn.com)	The NC coverage can be found on page 5-8. PowerPoint Presentation (kxcdn.com)	The NC coverage can be found on page 5-8 and page 11. PowerPoint Presentation (kxcdn.com)	The NC coverage can be found on page 17-22 PowerPoint Presentation (kxcdn.com)	The NC coverage can be found on page 5-8. PowerPoint Presentation (kxcdn.com)

Year 7 Assessment Matrix

Year 7	Sequences	Algebraic Notation	Equality and Equivalence	Place Value	Fractions, Decimals and Percentages	Addition and Subtraction	Multiplication and Division	Fractions and percentages of amounts	Directed number	Fractional Thinking	Constructing and Measuring	Geometric Reasoning	Developing Number Sense	Sets and Probability	Primes and Proof
Sequences	B														
Algebraic Notation	C	B													
Equality and Equivalence		C	B												
Place Value	C		C	B											
End of Term CORE test	E	E	E	E	E										
Fractions, Decimals and Percentages		C	C		B										
Addition and Subtraction			C		C	B									
Multiplication and Division				C		C	B								
Fractions and percentages of amounts						C	C	B							
Directed number							C	C	B						
End of Term CORE test	E	E	E	E	E	E	E	E	E	E					
Fractional Thinking							C		C	B					
Constructing and Measuring									C	C	B				
Geometric Reasoning									C		C	B			
Developing Number Sense										C		C	B		
Sets and Probability		C									C		C	B	
Primes and Proof												C	C		B
End of Year CORE test			E	E	E	E	E	E		E	E	E	E	E	E

Block Test	(green)
Can You Still?	(purple)
End of term CORE test	(light green)