

The bigger picture topic	Step	Learning intention	Support	Interleaving topics	Corberttmaths clip numbers
<p>Rationale: This unit is spent exploring sequences using diagrams and lists. Calculators should be used throughout so number skills are not a barrier to the spotting of patterns. (nth term is not covered) No higher content is taught in the first few blocks due to the cohort being in mixed sets ability wise until testing and resetting takes place. Higher steps have been integrated from block 4 onwards to facilitate this.</p>					
<p>Key words: Sequence, term, position, rule, term-to-term, axes, linear, non-linear, constant difference, ascending, descending, arithmetic, geometric, Fibonacci</p>			<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> • Move freely between numerical, algebraic, graphical and diagrammatic representations • Test conjectures about patterns and relationships • Recognise and generate arithmetic/geometric sequences 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> • Cryptologist – create, improve and break codes • Traffic light controller – sequences traffic lights at junctions
Block 1 Sequences	Check in.	TBAT Describe and continue sequences	PowerPoint Presentation (whiteroseeducation.com)	Addition Subtraction Multiplication	290, 289
	1	TBAT predict next terms			287
	2	TBAT recognise sequences graphically		Coordinates Plotting graphs	286, 287
	3	TBAT recognise linear and non-linear sequences			287
	4	TBAT continue linear sequences			287
	5	TBAT continue non-linear sequences			286
	6	TBAT explain term-term rules			
	7	TBAT complete check out			
		TBAT respond to feedback			
<p>Rationale: Unit is to develop a deep understanding of the basic algebraic forms. Function machines, bar models and letter notation are introduced. Single functions machines and links to inverse function machines are embedded before moving to two step function machines. The use of concrete resources such as multilink cubes and calculators should be used where possible. This block is revisited in year 8, extending coverage to more complex expressions, hence the importance of securing the introductory knowledge in this block.</p>					
Key words:			Explicit CEAIG links:		CEAIG careers:

<p><i>Function, input, output, estimate, operation, square, inverse, bar model, variable, coefficient, commutative, expression, evaluate, substitute, bracket, order, equation, axis, axes</i></p>	<ul style="list-style-type: none"> • Generalise and formulate mathematical relationships • Use inverse operations • Substitute values into expressions • Produce graphs of linear functions 	<ul style="list-style-type: none"> • Statistician – design experiments/surveys to collect data • Astronaut – Use formulae (distance to planets, G-Force, speed)
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<p>Block 2 Algebraic notation</p>	Check in.	TBAT find the output of a single function machine	<p>PowerPoint Presentation (whiteroseeducation.com)</p>	Square numbers Estimation	386	
	1	TBAT use inverse operations			386, 369	
	2	TBAT use diagrams and letters to generalise number operations			Square numbers Estimation	
	3	TBAT use diagrams and letters with single function machines			Function machines	386, 18
	4	TBAT find the function machine given a simple expression			Inverse operations	
	5	TBAT substitute values into single expressions			Inverse operations	20
	6	TBAT find the input and output of two step function machines			Order of operations	386
	7	TBAT use diagrams and letters with two step function machines				386, 18
	8	TBAT find a function given a two-step expression				
	9	TBAT substitute values into two-step expressions			Substitution Brackets Function machines	20
	10	TBAT complete check out				
		TBAT respond to feedback				

Rationale:
 This section introduces forming and solving one-step linear equations, building on inverse operations. Use of a calculator is encouraged to student develop the skills and not just spot the solutions. So careful consideration must be given to the problems posed.

<p>Key words: <i>Equality, equivalent, equations, equals, fact family, bar model, solve, solution, unknown, inverse, like & unlike terms, index, coefficient, expression, term, simplify, collect</i></p>	<p>Explicit CEAG links:</p> <ul style="list-style-type: none"> • Manipulate algebraic expression to maintain equivalence • Use approximation to estimate answers 	<p>CEAG careers:</p> <ul style="list-style-type: none"> • Astronomer- solve equations on gas phenomena, debris
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			<ul style="list-style-type: none"> Solve linear equations 	impacts, use artificial satellites to estimate impact	
Block 3 Equality & equivalence	Check in. 1	TBAT explain the meaning of equality	PowerPoint Presentation (whiteroseeducation.com)	Equations	
	3	TBAT solve one-step linear equations (+ & -)		Fact families	
	4	TBAT solve one-step linear equations (x & ÷)		Function machines	110
	5	TBAT identify like and unlike terms		Function machines	110
	7	TBAT simplify algebraic expressions		Algebraic notation	9
		TBAT complete check out			9, 18
		TBAT respond to feedback			
Assessment cycle	Baseline assessments (2 lessons)	Students will sit a series of assessments, testing knowledge they have acquired during the first 3 blocks of learning from year 7 and prior knowledge from year 6. The results of these test will allow us to set the students after October half term.			
	Feedback (2 lessons)				
Rationale: This unit follows on and builds on content taught at KS2 but extends to integers of 1 billion and decimals to hundredths. Rounding to 10s and 1 significant figure is taught, not decimal rounding. This unit introduces the range and median because separating them from other averages avoids confusion. Students should have met the range and median at KS2. Additional higher content in this block includes writing numbers in standard form, to challenge the more able students and to best prepare them to access additional higher content within the standard form block in year 8.					
Key words: <i>Place value, digit, placeholder, integer, billion, million, interval, scale, approximate, round, compare, greater than, less than, equal, order, ascend, descend, range, difference, median, average, decimal point, hundredth, tenth, significant figure, estimate, power, standard form, positive, negative, index</i>			Explicit CEAIG links: <ul style="list-style-type: none"> Compare numbers in standard form Round to appropriate degree of accuracy Interpret the median and range 	CEAIG careers: <ul style="list-style-type: none"> Astrophysicist- uses standard form for planet calculations, telescopes etc 	
Block 4 Place value	Check in. 1 & 2	TBAT recognise the place value of integers up to 1 billion & write these in words/figures	PowerPoint Presentation (whiteroseeducation.com)		222, 362, 363

	3 & 4	TBAT work out intervals & position integers on a number line		Scales (number line) Approximation	
	6 & 7	TBAT compare and order a list of integers		Substitution Sequences	
	8	TBAT find the range		Substitution	57, 57a
	9	TBAT find the median			50
	11	TBAT position decimals on a number line		Estimation	95
	13	TBAT round numbers to 1 significant figure			279a
	14 (H)	TBAT write numbers as powers of 10			203, 100
	15 (H)	TBAT write positive integers in the form $a \times 10^N$			300
	16 (H)	TBAT investigate negative powers of 10			
	17 (H)	TBAT write decimals in the form $a \times 10^N$			300
		TBAT complete check out			
		TBAT respond to feedback			
<p>Rationale: The aim to build on the previous units work and develop a deep understanding of the links between fractions and decimals. This unit also focuses on securing an understanding of common fractions under 1 but is extended to above one for the more able pupils. Pie charts are introduced whilst looking at percentages.</p>					
<p>Key words: <i>Place value, digit, tenths, hundredths, placeholder, interval, fraction, decimal, percentage, number line, fifth, quarter, eighths, thousandths, equivalent, convert, pie chart, sector, denominator, numerator, whole, quotient, operator, division, multiplication, improper, rational, recurring, mixed number</i></p>			<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> • Move freely between FDP • Work with FDP greater than 100% • Interpret pie charts 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> • Nutritionist – quantity measures, scale up recipes
Block 5 Fraction, decimal & percentage equivalence	Check in. 1 & 2	TBAT represent tenths and hundredths on diagrams and number lines	PowerPoint Presentation (whiteroseeducation.com)	Intervals on number lines Addition of decimals.	

	4 & 5	TBAT convert between fractions and decimals (tenths, hundredths, fifths & quarters)		Sequences Converting fractions to decimals Inequality signs	127, 128, 129
	6 (H)	TBAT convert between fractions and decimals (eighths & thousandths)			127, 128, 129, 123, 124
	9	TBAT interpret pie charts			164
	10 & 11	TBAT represent fractions on diagrams and number lines		Converting FDP	
	12	TBAT identify equivalent fractions			135
	13	TBAT use fractions as division			
	14	TBAT convert between fractions, decimals and percentages			125, 126, 127, 128, 129, 130
	15 (H)	TBAT explore fractions, decimal and percentage above 1		Sequences	
		TBAT complete check out			
		TBAT respond to feedback			
Assessment cycle	Autumn assessment				
	Personalised feedback	TBAT respond to autumn assessment feedback			Blocks 1-5 tested
Reflection	(2 lessons)	TBAT (These will vary class by class) Do not use "understand" as this is not measurable			
<p>Rationale: Students will have seen formal and mental methods for addition and subtraction at KS2. The focus here is building on KS2 skills but drawing on problems involving perimeter, money, bar charts and tables to ensure a deeper conceptual understanding. Frequency trees is likely to be a new concept. Higher content on adding and subtracting number in standard form has been added to this block to ensure continuity from the additional higher content taught in block 4.</p>					
<p>Key words: <i>Total, sum, difference, commutative, associative, inverse, bridging, partition, exchange, placeholder, decimal point, equivalence, estimate, inverse, addition, subtraction, digit, mental, calculator, perimeter, length, distance, units, edges, polygon, profit, loss, balance, credit, debit, statement, change, bill, frequency, duel, multiple, scale, axis, standard form, significant figure</i></p>			<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> Derive and apply formulae to calculate and solve problems Construct and interpret appropriate tables, charts and diagrams from numerical data 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> Programmer – using code or programming equipment using algebra Analyst – Businesses of all kinds analyse data

Block 6 Addition & subtraction	Check in. 3	TBAT use formal methods for addition of integers	PowerPoint Presentation (whiteroseeducation.com)	Algebraic substitution	6
	4	TBAT use formal methods for addition of decimals			90
	5	TBAT use formal methods for subtraction of integers		Solving equations	304
	6	TBAT use formal methods for subtraction of decimals		Converting fractions to decimals	91
	8	TBAT solve perimeter problems		Algebraic notation	241, 242
	9	TBAT solve financial maths problems		Estimation	400, 400a, 400b, 400c
	10	TBAT solve tables and timetable problems		Addition and subtraction	320
	11	TBAT solve frequency tree problems			376
	12	TBAT solve bar and line charts problems			147, 148, 148a, 148b
	13 (H)	TBAT add numbers in standard form			301
	13 (H)	TBAT subtract numbers in standard form			301
		TBAT complete check out and respond to feedback			
<p>Rationale: Revision of work from KS2 but extended. Emphasis is on solving problems particularly on area and the mean. Note the timing of the lessons in this unit will be driven by check in assessment. Choosing the correct operation to solve a problem will also be a focus. There will also be some exploration of the order of operations to ensure an early introduction, which will be reinforced alongside much of this content next term when studying directed number.</p>					
<p>Key words: <i>Product, quotient, multiply, divide, inverse, commutative factor, array, odd, even, Venn diagram, integer, lowest common multiple, convert, metric, gram, kilo, milli, centi, litre, estimate, remainder, dividend, decimal, base, parallelogram, parallel, perpendicular height, trapezium, triangle, mean, average, median, range, simplify</i></p>		<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> • Change freely between standard units • Use algebraic methods to solve linear equations • Describe interpret and compare observed distributions 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> • Builder – Use of different units • Chemist – Chemical compounds made like equations • Statistician – comparing and analysing data 	
Block 7	Check in.	TBAT use factors			216

Multiplication & division	2		PowerPoint Presentation (whiteroseeducation.com)		
	3	TBAT use multiples		Venn diagrams	220
	5 (H)	TBAT multiply by 0.1 and 0.01			203, 204
	6	TBAT convert metric units		Equivalence	347, 349a, 349b, 349c, 349d, 349e, 349f
	7	TBAT multiply integers		Place value	199, 200
	8	TBAT multiply decimals			94
	9	TBAT divide integers		Solving equations	98, 98a, 99, 100
	10	TBAT divide decimals			92, 101
	12 & 13	TBAT find the area of rectangles, parallelograms & triangles		45, 44, 49	
	14 (H)	TBAT find the area of trapezia		48	
	15	TBAT find the mean		53	
	16 (H)	TBAT multiply algebraic expressions		18	
	16 (H)	TBAT divide algebraic expressions		11	
		TBAT complete check out and respond to feedback			
<p>Rationale: This unit builds on the knowledge and understanding that students learned from block 5, FDP equivalence. Students will have covered finding fractions of an amount throughout KS2. This unit provides an opportunity for students to consolidate their understanding and attempt increasingly difficult problems. More lessons have been given to this unit to ensure a concrete understanding. Additional higher content looks at solving problems with fractions greater than 1 and percentages greater than 1 to allow students to apply previous higher steps of exploring fractions above 1, to problem solving style questions.</p>					
<p>Key words: <i>Fraction, equivalent, numerator, denominator, whole, percentage, convert, decimal, original</i></p>			<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> Interpret fractions and percentages as operators 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> Chef – Using different quantities within recipes Retail Management – Using percentages for VAT or sales
Block 8 Fractions & percentages of amounts	Check in.	TBAT find a fraction of a given amount	PowerPoint Presentation (whiteroseeducation.com)	Equivalence	137
	1	TBAT find the whole of fractions			138
	2	TBAT find the percentage of an amount (non-calculator)		Place value	234
	3	TBAT find the percentage of an amount (calculator)			235
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	5 (H)	TBAT solve problems with fractions & percentages greater than 1 and 100%				
		TBAT complete check out and respond to feedback				
<p>Rationale: Students will only have had limited experience of directed number at primary school, so this unit is designed to extend and deepen their understanding of this. To ensure continuity from primary school settings, multiple representations and contexts will be used to enable students to appreciate the meaning behind operations with negative integers, rather than relying on a set of potentially confusing rules. The use of multiple representations is important, to ensure continuity for students that were exposed to directed number, and to ensure a deep conceptual understanding for pupils who will be working with directed numbers for the first time. Additional higher content covers exploring higher powers and roots.</p>						
<p>Key words: Positive, negative, reflection, symmetrical, ascend, descend, greater/less than, increase, decrease, difference, minus, zero pair, partition, product, inverse, fraction button, sign change, substitute, order of operations, expression, solve, solution, function machine, balance, indices, brackets, priority, square, square root, exponent</p>		<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> Select and use appropriate calculation strategies to solve complex problems substitute numerical values into formulae and expressions, including scientific formulae 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> Mathematician - knowledge of methods to apply to theory or codes Lab technician – using scientific formula in testing 		
<p>Block 9 Directed number</p>	<p>Check in. 3</p>	TBAT perform calculations across zero	<p>PowerPoint Presentation (whiteroseeducation.com)</p>	Simplifying algebraic expressions		
	4 & 5	TBAT add and subtract directed numbers			205	
	6 & 7	TBAT multiply and divide directed numbers			206, 207	
	8	TBAT use a calculator for directed number calculations			Substitution	
	9	TBAT evaluate algebraic expressions with directed number			Order of operations	
	11	TBAT solve two-step equations			Function machines	386
	13 (H)	TBAT find roots of positive numbers				228
	14 (H)	TBAT explore higher powers and roots				17
		TBAT complete check out and respond to feedback				
<p>Assessment cycle</p>	<p>Spring assessment</p> <p>Spring assessment</p>					

	Personalised feedback	TBAT respond to autumn assessment feedback			Blocks 6-9 tested
<p>Rationale: This unit builds on the Autumn term study of “key” fractions, decimals and percentages. It is sequenced after the autumn block and after the directed number block to ensure students are ready to be exposed to more advanced fractions work, including equivalence of fractions with any denominator and introducing the addition and subtraction of fractions. The use of bar models and concrete representations is used extensively throughout. Higher content in this block includes addition and subtraction of algebraic fractions which interleaves the previous algebra block to aid retrieval and to challenge the more able.</p>					
<p>Key words: <i>Congruent, divide, denominator, numerator, ascend, descend, unit fraction, multiple, mixed number, improper fraction, equivalent, common denominator, lowest common multiple, sequence, substitute, solve, geometric, linear, simplify, like terms, collect</i></p>		<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> • move freely between different numerical, graphical and diagrammatic representations • work interchangeably with terminating decimals and their corresponding fractions 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> • Engineer – using graphs or diagrams to interpret results and apply them • Budgeting – Analysing finances 	
<p>Block 10 Add and subtract fractions</p>	<p>Check in. 2</p>	TBAT convert between mixed numbers and fractions	<p>PowerPoint Presentation (whiteroseeducation.com)</p>	Number lines	129
	8	TBAT add and subtract fractions with any denominator		Equivalence Lowest common multiple	132, 133
	9	TBAT add and subtract improper fractions and mixed numbers		Converting mixed numbers	139, 140
	10	TBAT use fractions in algebraic contexts		Function machines Substitution	
	12 (H)	TBAT add and subtract simple algebraic fractions			21
		TBAT complete check out and respond to feedback			
<p>Rationale: This block is designed to build on KS2 skills using rulers, protractors and other measuring equipment. This block will lay solid foundations for when students need to construct triangles and other regular polygons in year 8. Students must draw upon previous knowledge of fraction, decimal and percentage equivalence to draw and interpret pie charts.</p>					
<p>Key words: <i>Line segment, notation, geometric figure polygon, length, height, width, angle, degrees, rotation, acute, obtuse, reflex, right-angle, interior, exterior, protractor, construct, sum, measure, parallel, perpendicular, intersect, equilateral, isosceles, scalene, square, rectangle, kite, rhombus,</i></p>		<p>Explicit CEAIG links:</p> <ul style="list-style-type: none"> • Reason deductively in geometry in figures and scale drawings • Describe, sketch and draw conventional points, lines, and angles 		<p>CEAIG careers:</p> <ul style="list-style-type: none"> • Town planning – use scale drawings of areas • Architecture – Use knowledge of angles and 	

<i>parallelogram, trapezium, polygon, edges, vertices, compass, compound, proportion, sector, frequency</i>				lines to construct designs of buildings	
Block 11 Constructing, measuring & using geometric notation	Check in. 2 & 4	TBAT draw and measure line segments & classify angles	PowerPoint Presentation (whiteroseeducation.com)		28, 31, 38, 29
	5 & 6	TBAT measure and draw angles up to 180 degrees			28, 31, 35
	7	TBAT measure and draw angles between 180-360 degrees			28, 31, 35, 30
	8	TBAT identify parallel and perpendicular lines			
	9, 10 & 11	TBAT identify types of triangles, quadrilaterals and other polygons			327
	16	TBAT interpret pie charts			164
	17	TBAT draw pie charts			163
		TBAT complete check out and respond to feedback			
<p>Rationale: This block covers basic geometric language and names and properties of types of triangles and quadrilaterals. Angle rules will be introduced and used to form short chains of reasoning, with a focus on students becoming fluent and building resilience in their reasoning skills. This is sequenced to build on the angle rules whilst stretching and challenging students further. There are also opportunities for interleaving work to include solving equations and to revisit the algebra block.</p>					
<p>Key words: <i>Sum, angle, degrees, line segment, notation, adjacent, vertically opposite, intersect, convex, concave, quadrilateral, straight line, polygon, point, regular, interior, exterior, perpendicular, transversal, parallel, co-interior, corresponding, alternate, opposite</i></p>		<ul style="list-style-type: none"> • Explicit CEAIG links: • Reason deductively in geometry in figures and scale drawings • Describe, sketch and draw conventional points, lines, and angles 	<p>CEAIG careers:</p> <ul style="list-style-type: none"> • Town planning – use scale drawings of areas • Architecture – Use knowledge of angles and lines to construct designs of buildings 		
Block 12 Geometric reasoning	Check in. 1, 2 & 3	TBAT solve problems with angles at a point, on a straight line and vertically opposite	PowerPoint Presentation (whiteroseeducation.com)		35, 25
	4 & 5	TBAT solve problems with angles in a triangle and quadrilateral		Adding Subtracting Solving equations	37, 33
	7	TBAT solve complex angle problems			

	8 (H)	TBAT find the sum of angles in a polygon			32
	11 (H)	TBAT solve simple proofs			
		TBAT complete check out and respond to feedback			

Rationale:
 Probability is not covered at KS2 therefore this content will be unfamiliar to the students. Students will learn about sets, set notation and systematic listing strategies whilst revisiting topics such as solving equations and adding and subtracting fractions, which interleave quite well. This coverage is also reviewed and extended in year 8. Additional higher content in this block includes understanding and using the complement of a set. This knowledge will be built upon in the autumn term of year 8 when exploring the product rule for counting.

Key words: <i>Universal set, inclusive, element, member set, Venn diagram, intersection, union, mutually exclusive, complement, impossible, likely, even, unlikely, certain, random, bias, fair, event, sample space, possibilities, outcomes, simplify, scale, sum</i>	Explicit CEAIG links: <ul style="list-style-type: none"> Record describe and analyse probability 	CEAIG careers: <ul style="list-style-type: none"> Bookkeeping – Use odds and probability analysis
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Block 14 Sets & probability	Check in. 1	TBAT represent sets	PowerPoint Presentation (whiteroseeducation.com)	Multiples	
	2	TBAT draw and interpret Venn diagrams		Factors	
	3 & 4	TBAT use the union and intersection of sets		Odd numbers Even numbers Square numbers	380
	5 (H)	TBAT use the complement of a set			380
	8	TBAT calculate the probability of a single event			245, 244
	9	TBAT use the probability scale		FDP conversion Number lines	251, 244
	10	TBAT know the sum of probabilities is 1		Forming and solving equations	
		TBAT complete check out and respond to feedback			

Rationale:
 Factors and multiples will be revisited to introduce the concept of prime numbers. Odd, even, prime, square and triangular numbers will be used as the basis of forming and testing conjectures. The use of counter examples will also be addressed. Interleaving work will include generating and describing sequences and factors and multiples. The higher strand includes using Venn diagrams from the previous block to solve more complex HCF and LCM problems.

Key words: <i>Multiples, integer, zero, factor, factorise, divisible, divisor, remainder, term, prime, odd, even, triangular, square, investigate, digit, highest common factor, lowest common multiple, factorise, product</i>			Explicit CEAIG links: <ul style="list-style-type: none"> Make and test conjectures about patterns and relationships 		CEAIG careers: <ul style="list-style-type: none"> Air Traffic Control – use flight paths and weather information to predict travel of aircraft 	
Block 15 Primes & proof	Check in. 1 & 2	TBAT identify multiples and factors of a number	PowerPoint Presentation (whiteroseeducation.com)	Multiples	220, 216	
	3 & 4	TBAT identify primes, square and triangular numbers		Algebraic expressions	225, 226, 229	
	5	TBAT find the highest common factor (HCF)		Sequences		
	6	TBAT find the lowest common multiple (LCM)		Area	219	
	7	TBAT write a number as a product of its prime factors		Adding and subtracting fractions	218	
	8 (H)	TBAT use a Venn diagram to calculate the HCF & LCM			223	
		TBAT complete check out and respond to feedback		Multiplication Division Prime numbers	224	
Assessment cycle			Summer assessment			
			Summer assessment			
			Summer assessment			
	Personalised feedback	TBAT response to summer assessment feedback			Blocks 10-15 tested	
	Personalised feedback	TBAT response to summer assessment feedback			<i>Block 13 has been omitted</i>	
Reflection/ consolidation week	(Rest of term 3/4 weeks)	TBAT (These will vary class by class) Do not use “understand” as this is not measurable	Use QLA from summer assessment to identify gaps and reteach areas of weakness			