Mathematics Route Planner

Introduction to Curriculum Route Planners

Route Planners outline the Key Stages 1-3 curriculum to be taught within each campus of the Bury St Edmunds All-Through Trust. Each Route Planner has been designed to take into account both the new Primary Curriculum and the new GCSE specifications so that pupils' learning progresses seamlessly from ages 4 to 16 and prepares them thoroughly for the modern world and for the values which are fundamental to life in modern Britain.

Route Planners have been created for all core and foundation subjects. They have been written by Curriculum Development Teams, comprising subject leaders from each Trust campus.

The purposes of the Route Planner are to ensure coherence of curriculum across the Trust, to provide a framework for subject leaders to develop Schemes of Work, and to provide parents with information on what children will learn during each year of their education.

Key stage 1 - years 1 and 2

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Year 1 programme of study

	Pupils will be taught to…
Number - number and place value	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s • given a number, identify 1 more and 1 less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words
Number - addition and subtraction	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including 0 • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9
Number - multiplication and division	• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher
Number - fractions	• recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity • recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity
Measurement	• compare, describe and solve practical problems for: • lengths and heights [for example, long/short, longer/shorter, tall/short,

	double/half] • mass/weight [for example, heavy/light, heavier than, lighter than] • capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • time [for example, quicker, slower, earlier, later] • measure and begin to record the following: • lengths and heights • mass/weight • capacity and volume • time (hours, minutes, seconds) • recognise and know the value of different denominations of coins and notes • sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
Geometry - properties of shapes	• recognise and name common 2-D and 3-D shapes, including: • 2-D shapes [for example, rectangles (including squares), circles and triangles] • 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]
Geometry - position and direction	• describe position, direction and movement, including whole, half, quarter and three-quarter turns

Year 2 programme of study

	Pupils will be taught to…
Number - number and place value	• count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • recognise the place value of each digit in a two-digit number (10s, 1s) • identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems
Number - addition and subtraction	• solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and 1s

	• a two-digit number and 10s • 2 two-digit numbers • adding 3 one-digit numbers • show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
Number - multiplication and division	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
Number - fractions	• recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • write simple fractions, for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
Measurement	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day
Geometry - properties of shapes	• identify and describe the properties of 2-D shapes, including the number of sides, and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] compare and sort common 2-D and 3-D shapes and everyday objects
Geometry - position and direction	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and

	anti-clockwise)
Statistics	• interpret and construct simple pictograms, tally charts, block diagrams and tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask-and-answer questions about totalling and comparing categorical data

Lower key stage 2 - years 3 and 4

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.

Year 3 programme of study

	Pupils will be taught to…
Number - number and place value	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • recognise the place value of each digit in a 3-digit number (100s, 10s, 1s) • compare and order numbers up to 1,000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1,000 in numerals and in words • solve number problems and practical problems involving these ideas

Number - addition and subtraction	• add and subtract numbers mentally, including:
	  • a three-digit number and 1s
	  • a three-digit number and 10s
	  • a three-digit number and 100s
	• add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
	• estimate the answer to a calculation and use inverse operations to check answers
	• solve problems, including missing number problems, using number facts, place

	value, and more complex addition and subtraction
Number - multiplication and division	• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects
Number - fractions	• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above
Measurement	• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes • add and subtract amounts of money to give change, using both £ and p in practical contexts • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events [for example, to calculate the time taken by particular events or tasks]
Geometry - properties of shapes	• draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • recognise angles as a property of shape or a description of a turn • identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle • identify horizontal and vertical lines and pairs of perpendicular and parallel lines
Statistics	• interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

Year 4 programme of study

	Pupils will be taught to…
Number - number and place value	• count in multiples of 6, 7, 9, 25 and 1,000 • find 1,000 more or less than a given number • count backwards through 0 to include negative numbers • recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) • order and compare numbers beyond 1,000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1,000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value
Number - addition and subtraction	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
Number - multiplication and division	• recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects
Number - fractions (including decimals)	• recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundreds • recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with 1 decimal place to the nearest whole number • compare numbers with the same number of decimal places up to 2 decimal places • solve simple measure and money problems involving fractions and decimals to 2 decimal places

Measurement	• convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days
Geometry - properties of shapes	• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to 2 right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry
Geometry - position and direction	• describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon
Statistics	• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

	Area of Study	*Core* Assessment Objectives	*Extension* Assessment Objectives (KS3)
Year 5	**1. Number Sense and Place Value:** • Ordering whole numbers and decimals using place value • Using place value to round to 10s, 100s, 1000s, 10ths • Understand the value of common fractions and percentages	1.1 I can show understanding of place value, including large numbers and decimals (to the hundredth place). 1.2 I can show an understanding of the relationship of fractions, decimals and percentages through equivalencies and comparisons. 1.3 I can show an understanding of values of fractions with different denominators through comparisons.	
	2. Efficient Methods of Calculation: • Multiplication facts to 10; some with 11 & 12 • Mental manipulation using number bonds to 100, scaling, and include inverse operations • Using column addition up to ten thousands and to the hundredths (with money) including regrouping • Using column subtraction up to ten thousands and to the hundredths (with money) including regrouping • Work toward using long multiplication (relate to other methods of multiplication) up to 3 digit by 2 digit • Division with chunking of multiples through subtraction with three digit • Short division with 4 digit by 1 digit	2.1 I can use an efficient method for addition and subtraction with whole numbers and decimals. 2.2 I can use an efficient method for multiplication and division with whole numbers and decimals. 2.3 I can add and subtract simple fractions with different denominators (less than 10).	

3. Geometry: • Recogonise and name a full range of shapes 2D and 3D • Identify properties of key 2D and 3D shapes • Begin to measure angles and classify by acute, obtuse, right and reflex • Plot co-ordinates in the first and second quadrant using co-ordinates	3.1 I can identify properties of most 2-D and 3-D shapes. 3.2 I can measure and classify angles including acute, obtuse and reflex angles.	
4. Measurement: • Convert common metric measurements in length, mass and capacity • Convert common metric measurements in context and problem solving • Match digital and analog time to 5 minutes • Convert time from 12 hour to 24 hour and in reverse • Calculate length of time to the nearest 5 minutes	4.1 I can convert common measurements for length, mass and capacity. 4.2 I can accurately measure length of time to the nearest 5 minutes.	
5. Problem Solving: • Use problem solving up to three steps using addition, subtraction and multiplication • Read, understand and answer questions from pictograms, bar charts and line graphs	5.5 * I can use formal methods to solve multi-step problems with up to 3 steps and with more than one method of calculation in a variety of contexts.	

Year 6	**1. Number Sense and Place Value:** • Ordering whole numbers, fractions, decimals, percentages and mixed numbers • Using place value to round to 10s; 100s; 1000s; 10,000ths; 10ths; and 100ths • Understand the value of simple and improper fractions; mixed number; decimals and percentages.	1.1 I can confidently demonstrate place value, including large numbers and decimals (to the thousandths).	
	2. Efficient Methods of Calculation: • Multiplication facts to 12 • Mental manipulation using number bonds to 1000, scaling, and include inverse operations • Using column addition up to 7-digit number and to the thousandths including regrouping • Using column subtraction up to 7 digits and to the thousandths (with money) including regrouping • Use efficient long multiplication up to 5 digit by 2 digit • Use short division with 5 digit by 1 digit • Use knowledge of multiples to add and subtract fractions and mixed numbers with different denominators • Use algorithm and conversion of fractions for multiplying and dividing fractions and mixed numbers	2.2 I can justify and explain comparison of fractions, decimals and percentages showing an understanding of their value. 2.2 I can use efficient mental strategies to strategies for calculations. 2.3 I can use efficient methods for addition and subtraction with fluency and speed. 2.4 I can use efficient methods for multiplication and division with fluency and speed. 2.5 I can use an efficient method to add and subtract fractions with different denominators. 2.6 I can use a method to multiply and divide fractions. 2.7 I can apply knowledge of fractions, decimals and percentages to whole numbers.	

3. Geometry: • Use properties of geometric shapes to find missing angles, perimeters and volume • Measure angles accurately to within 5 degrees • Create simple shapes with ruler and protractor with given angles or dimensions • Label and understand relationship of radius, diameter and circumference of a circle • Plot co-ordinates in all quadrant and find missing co-ordinate points of 2D shapes	3.1 I can find the area and perimeter of compound shapes. 3.2 I can use the properties of shapes to find missing angles including rectangles, triangles and compound shapes.	
4. Algebra: • Use formulae to determine perimeter, area, volume of common 3D objects • Identify missing numbers in calculations and sequences using inverse operations including addition, subtraction, multiplication and division • Identify 'rule' for sequences that involve addition, subtraction, multiplication and division	4.1 I can use a variety of formulas to solve problems such as area and perimeter. 4.2 I can identify a 'rule' for sequences that involve more than operation.	
5. Measurement: • Convert all metric measurements for length, mass and capacity • Determine which metric measurements is needed in problem solving, making conversions for accurate calculation	5.1 I can convert metric measurements as needed within multi-step problems.	

• Calculate the length of time using 12 hour and 24 hour clocks to the nearest 1 minute • Change minutes to hours and hours to minutes		
6. Data and Statistics: • Collect and collate data into a meaningful table and graph • Calculate the mean, median, mode and range of a given set of data • Make conclusions based on the data • Make predictions based on data	6.1 I can collect, analyse and make predictions from a set of data.	
7. Problem Solving: • Use problem solving up to four steps using addition, subtraction, multiplication and division with whole numbers, decimals and fractions • Interpret and predict using line graphs	7.1 * I can use formal methods to solve multi-step problems with up to 4 different calculations in a wide range of contexts.	

Year 7 *Numbers refer to Collins five year Scheme of work for Edexcel.*	**1. Learning Area: Using Numbers** 1.1 Calendar 1.2 12/ 24 hour clock 1.3 Managing Money 1.5 & 1.6 Adding and Subtracting negative numbers 5.1 Square numbers 5.2 Rounding 5.3 Order of operations 5.4 & 5.5 Long and short multiplication and division 5.6 Calculations with measurements	• I can read and use the calendar, the 12 hour and 24-hour clock • I can solve every day money problems • I can calculate with negative numbers including adding and subtracting • I can recognise and use square numbers • I can round to the nearest 10,100 and 1000 • I can use BIDMAS to carry out calculations • I can calculate using long and short multiplication and division • I can convert between metric units and use appropriate units	• I can work out the square roots • I can calculate with negative numbers including subtracting and multiplying • I can work out long multiplications and division problems without a calculator
	2. Coordinates and graph 10.1 Coordinates 10.2 from Mapping to Graphs 10.3 naming graphs 10.4 Graphs from the real world	• I can work out coordinates from a rule and draw the graph • I can use graphs to represent real life situations	• I can plot coordinates in four quadrants • I can draw graphs of fixed values of x and y, y = x and y = –x
	3. Fractions, decimal and Percentages 4.1 Multiplying and dividing by 10,100,1000 4.2 Ordering decimals 4.3 Estimates 4.4 Adding and subtracting decimals 4.5 & 4.6 Multiplying & dividing decimals 8.1 Equivalent fractions 8.2 Comparing fractions 8.3 Adding and subtracting fractions 8.4 Mixed numbers and improper fractions	• I can multiply and divide by power of 10 • I can order decimals • I can use rounding to estimate value of calculations • I can calculate with decimals including adding, subtracting, multiplying and dividing. • I can simplify fractions and use equivalent fraction to compare • I can calculate with fractions and mixed numbers including adding and subtracting. • I can convert between fractions and percentages • I can work out fraction of a quantity • I can work out a percentage increase and decrease with	• I can convert between fractions, decimals and percentages

8.5 Calculations with mixed numbers 11.1 Fractions and percentages 11.2 Fractions of a quantity 11.3 percentages of a quantity 11.4 Percentages with a calculator 11.5 Percentage increase and decrease	and without a calculator	
4. Probability 12.1 Probability in words 12.2 probability scales 12.3Experimental probability	• I can calculate probability using probability scale and experimental probability	• I can calculate probability using probability scale and combined events
5. Algebra 7.1 Expressions and substitution 7.2 Simplifying expressions 7.3 Using formulae 7.4 Writing formulae 14.1 Finding unknown numbers 14.2 Solving equations 14.3 Solving more complex equations 14.4 Setting up and solving equations	• I can use algebra to write expressions and substitute in them • I can simplify expressions • I can write and use Formulae • I can set up equations and solve them including complex equations	
6. Statistics 6.1 Mode, median and range 6.2 reading data from tables and charts 6.3 Using a Tally 6.4 using data 6.5 grouped frequency 6.6 Data collection 15.1 Pie charts 15.2 Comparing data using median and the range	• I can work out the mode, median and range for a set of data • I can read data from table and charts • I can draw a data collection sheet and use tally • I understand and can use grouped frequency • I can draw a pie chart • I can compare data using averages and range	• I can work out the mean for a set of data • I can draw a data collection sheet and use tally for continuous and discrete data. • I can compare data using median and range

15.3 Statistical surveys		
7. Ratio 17.1 Introduction to ratios 17.2 Simplifying ratios 17.3 Ratios and sharing 17.4 Ratios and fractions	• I can simplify ratios and use ratio to work out shared quantities • I understand and can use the connection between ratio and fraction	
8. Sequences 2.1 Function machines 2.2 Sequences and rules 2.3 Finding missing terms 2.4 square numbers 2.5 triangular numbers	• I can use the function machines • I can recognise and write down simple rules for sequences • I can work out the missing term in a sequence • I can recognise the square and triangular numbers sequences	• I can work out the nth term • I can recognise more complex sequences
9. Perimeter, area and volume 3.1 length and perimeter 3.2 area 3.3 perimeter and area of a rectangle 16.1 3D shapes and nets 16.2 Using nets to construct 3D shapes	• I can work out the perimeter and area by counting lengths and squares • I can work out the perimeter and area of a rectangle • To can count the faces, vertices and edges on a 3 D shape • I can draw nets for 3 D shapes	• I can work out the perimeter and area of compound shapes • I can work out the surface area and volume of cubes and cuboids
10. Geometry and measure 9.1 using a compass to give directions 9.2 measuring angles 9.3 drawing angles 9.4 calculating angles 9.5 Properties of triangles and quadrilaterals 13.1 Line symmetry 13.2 Rotational symmetry 13.3 Reflection	• I can use compass to give directions • I can draw and measure angles • I can calculate angles on a straight line and around a point • I can use properties of triangles and quadrilaterals to work out angles • I can recognise shapes with symmetry lines and can draw those lines • I can recognise shapes with rotational symmetry and can find the order of rotation	• I can recognise corresponding and alternate angles

	13.4 Tessellations	• I can reflect shapes • I can tessellate shapes	
Year 8 *Numbers refer to Collins five year Scheme of work for Edexcel.*	**1. Learning Area: Using Numbers** 1.1 Adding and subtracting with negative numbers 1.2 Multiplying and Dividing with negative numbers 1.3 & 1.6 Prime factors ,factors and HCF 1.4 Multiples and LCM 1.5 & 8.1 Powers (powers of 10) and roots 8.2 & 8.4 large numbers Estimating and rounding 8.3 Significant figures 8.5 Problem solving with decimals	• I can calculate with negative numbers including adding, subtracting, multiplying and dividing. • I can use knowledge of factors and multiples to find prime factors, HCF and LCM. • I can round to significant figures and use power of 10 to represent extremely large and small numbers. • I can solve multi-step problems with decimals using a full range of calculation skills in a range of contexts	• I can multiply and divide with negative power of 10 • I understand and can use the square and the cube roots. • I can use standard forms to represent large and small numbers. • I calculate using fractions including adding, subtracting, multiplying and dividing.
	2. Coordinates and graphs 7.1 Rules with coordinate 7.2 Graphs from rules 7.4 distance-time graphs	• I can graph co-ordinate points using rules and from simple quadratic equations • I can accurately graph, interpret and make predictions with distance-time graphs.	• I can find the gradient of a straight line • I can accurately interpret and make predictions from real life graphs.
	3. Fractions, decimal and Percentages 4.1 & 4.2 Calculating percentages (simple increase and decrease) 4.3 Calculating a percentage change 12.1 Adding and subtracting fractions 12.2 & 12.3 Multiplying and dividing fractions and integers 12.4 & 12.5 Multiplication and Division with power of 10	• I can calculate percentage and percentage change. • I can calculate using fractions including adding, subtracting and dividing. • I can multiply and divide with power of 10	• I can calculate percentage and percentage change. • I can calculate using fractions including adding, subtracting and dividing. • I can multiply and divide with power of 10

	4. Probability 3.1 & 3.3 Probability Scale and mixed events 3.2 Collecting data for a frequency table 3.4 Using a sample space to calculate probabilities 3.5 Experimental probability	• I can calculate probability using probability scale, sample space and experimental probability • I can collect data for a frequency table	• I can identify mutually exclusive outcomes and exhaustive outcomes
	5. Algebra 10.1 Algebraic notation 10.2 & 10.3 Expanding brackets and collecting Like terms 10.4 Using algebra 10.5 Using powers 15.1 & 15.2 Equations with brackets including variable on both sides 15.3 More complex equations 15.4 Substituting into formulae	• I can use knowledge of algebraic notation to expand brackets and collect like terms. • I can write algebraic expressions involving power. • I can solve equations with variable on both sides and more complex ones. • I can substitute into formulae and evaluate.	• I can write algebraic expressions including the nth term from sequences. • I can solve equations with variable and brackets on both sides. • I can rearrange the formulae.
	6. Statistics 9.1 Information from charts 9.2 & 9.3 pie charts 9.4 Scatter graphs 16.1 frequency tables 16.2 The mean 16.3 Drawing frequency diagrams 16.4 & 16.5 Comparing data including which average to use	• I can read from information from chart, scatter graphs and frequency tables. • I can use a scaling method to draw a pie chart. • I can draw a suitable diagram from frequency table. • I can use averages to compare data.	• I can draw a scatter graph and identify the correlation. • I can draw a grouped frequency table from raw data • I can compare sets of data nad understand misleading charts.
	7. Ratio 11.1 Congruent shapes 11.2 Shape and ratio	• I can identify congruent shapes. • I can use ratio to compare lengths and areas of 2D shapes.	• I can identify congruent shapes. • I can use ratio to compare volumes. • I can understand and use map scales.

	11.3 Scales diagrams 13.1 Direct proportion 13.2 Graphs and direct proportion	• I can understand and use scale diagrams. • I can use my knowledge of direct proportion graphically and algebraically to solve problems. • I can recognise the difference between the direct and inverse proportion in problems.	
	8.		
	9. Perimeter, area and volume 6.1 & 6.2 & 6.3 & 6.4 Area of compound shapes 14.1 The circle and its parts 14.2 & 14.3 Circumference of a circle	• I can calculate the area of rectangle, triangle and parallelogram in compound shapes. • I can name the different parts of the circle. • I can calculate the circumference of a circle.	• I can calculate the surface area of prisms using metric units. • I can calculate the Volume of prisms. • I can calculate the area of a circle.
	10. Geometry and measure 2.1 Parallel and perpendicular lines 2.2 Angles in triangles and quadrilaterals 2.3 Translations 2.4 Rotations	• I can identify parallel and perpendicular lines. • I can calculate the missing angle in a triangle or a quadrilateral. • I can translate and rotate a shape.	• I can identify the geometric properties of quadrilaterals. • I can enlarge a shape using different scale factors including fractional scales. • I can construct a triangle and draw the angle and perpendicular bisector

Year 9 *Numbers refer to Collins five year Scheme of work for Edexcel.*	**1: Number: Basic number** 1.1 Place value and ordering numbers 1.2 The four rules 1.2 Order of operations and BIDMAS	• I can use inequalities with negative numbers • I can use the four rules of arithmetic with integers and decimals. • I can work out the answers to problems with more than one mathematical operation.	• I can calculate with positive and negative powers of 10 • I can calculate using standard form for positive and negative powers of 10 • I can use limits of accuracy when rounding data
	2: Geometry and measures: Measures and scale drawings 2.1 Systems of measurement 2.2 Conversion factors	• I can use approximate conversion factors to change between imperial units and metric units. • I can read use scale of drawings • I can draw nets of some 3D shapes and identify 3D shapes from its net • I can interpret diagrams to draw plans and elevations.	• I can calculate the volume and the surface area of a cylinder • To calculate the volumes and surface areas of composite shapes
	3: Statistics: Charts, tables and averages	• I can use tally charts and grouped frequency tables to collect and represent data • I can draw bar charts and vertical line charts to represent statistical data. • I can draw a line graph to show trends in data. • I can work out the mode, median, mean and range of small sets of data	• I can estimate a mean from grouped data • I can draw a cumulative frequency diagram and find the interquartile range • I can draw a line of best fit to show a correlation • I can draw exponential growth graphs
	4: Geometry and measures: Angles	• I can calculate angles on a straight line and around a point • I can recognise and calculate the angles in different sorts of triangle.	• I can establish which regular polygons tessellate • I can use Pythagoras' theorem to calculate missing sides in right- angled triangles • I know how to find the trigonometric ratios of

		• I can calculate the interior and exterior angles in a regular polygon. • I can calculate angles in parallel lines and in quadrilateral. • I can use a bearing to specify a direction.	sine, cosine and tangent in a right-angled triangle • I can find the angle identified from a trigonometric ratio • I can find an unknown length of a right-angled triangle given one side and an angle
	5: Number: Number properties	• I can find multiples and factors of a number • I can identify prime factors and write a number as a product of its prime factors. • I can identify the lowest common multiple (LCM) of two numbers • I can identify the highest common factor (HCF) of two numbers. • I can identify square numbers and work out their square roots	
	6: Number: Approximations	• I can round to the nearest whole number. • I can round numbers to a given number of significant figures • I can use approximation to estimate answers and check calculations	
	7: Number: Decimals and fractions	• I can multiply and divide with decimals. • I can recognise different types of fraction, reciprocal, terminating decimal and recurring decimal • I can convert decimals to fractions • I can work out a fraction of a quantity • I can add and subtract fractions with different denominators. • I can multiply and divide mixed numbers • I can use a calculator to add, subtract, multiply and divide fractions.	• I can add, subtract, multiply or divide fractions containing a variable

	8: Algebra: Linear graphs	• I can work out the equations of horizontal and vertical lines. • I can draw a straight line and work out the gradient of it. • I can work out the equation of a line, using its gradient and y-intercept • I can work out the equation of a linear graph that is parallel to another line and passes through a specific point. • I can convert from one unit to another unit by using a conversion graph • I can solve simultaneous linear equations using graphs.	• I can solve a pair of simultaneous equations graphically • I can solve quadratic equations graphically
	9: Algebra: Expressions and formulae	• I can recognise expressions, equations, formulae and identities. • I can substitute into, simplify and use algebraic expressions. • I can expand and simplify brackets. • I can factorise an algebraic expression. • I can expand two linear brackets to obtain a quadratic expression. • I can factorise a quadratic expression of the form x2 + ax + b into two linear brackets. • I can change the subject of a formula.	• I can expand brackets and simplify more complex expressions • I can expand and factorise expressions with more than one variable • I can solve equations where the variable is in the denominator of a fraction • To recognise and use the difference of two squares to solve an equation
	10: Ratio and proportion and rates of change: Ratio, speed and proportion	• I can simplify a ratio and express is as a fraction • I can divide amounts into given ratios • I can recognise the relationship between speed, distance and time • I can recognise and solve problems that involve direct proportion. • I can find which product is better value by working out the unit cost.	• I can solve problems involving simple and compound interest • I can calculate the original value, given a percentage change • I can solve problems involving density, mass and volume