

Overview plans for academic year 2023-2024
Subject: Mathematics
Year group/cohort: Key Stage 3 – OAK, CEDAR and ROWAN

	Knowledge and Understanding	Knowledge and Understanding	Skills	Skills	Assessment	Subject specific literacy	Cross curricular links
	Components (Key concepts)	Composite (Bigger picture)	Components (Key concepts)	Composite (Bigger picture)	What is being assessed, how, and when?	Key Vocabulary	Including Personal Development and SMSC
Autumn	Order positive and negative numbers Be able to use inequality symbols to compare two integers Arithmetic with directed number Multiply and Divide by powers of 10 Be able to use BIDMAS Round numbers to the nearest 10, 100 and 1000	Integers and Place Value	To use the number system including negative numbers	Understand and apply BIDMAS	Number and the number system	Negative BIDMAS Integer	To be able to use money in society and be competent in the use of BIDMAS to be able to understand current calculations.
Autumn	Use decimal notation and place value Be able to use inequality symbols to compare two decimals Add, subtract, multiply and divide decimals, including calculations involving money Multiply and divide by a decimal Round to the nearest integer Round both positive and negative numbers to a given number of decimal places Round both positive and negative numbers to any given number of significant figures Estimate answers to calculations by rounding numbers to 1 significant figure	Decimals	To use the correct place value when calculating decimals. To use estimation to understand rounding numbers. Understand the significant of figures.	Significant figures Rounding Estimation Place value	Decimals and place values	Significant Figures Rounding, Estimation Place value Rounding Inequality	To be able to access the decimal system in all areas of life.

Autumn	Recall integer squares up to 10×10 and the corresponding square roots Recall the cubes of 1, 2, 3, 4, 5 and 10; Evaluate expressions involving squares, cubes and roots Distinguish between exact representations of roots and their decimal approximations Add, subtract, multiply and divide numbers in index form Use the laws of indices to simplify numbers written in index notation Be able to use the calculator to answer complex calculations.	Indices, Powers and Roots	Apply the laws of indices. Be able to recognise the powers and use multiplication to apply the rules of powers. Recall the powers of number up to ten. Be able to under powers using roots.	Use of the laws of indices. Able to apply the correct powers in calculations. Use the correct root when applying calculations.	Rules of powers Apply the laws of indices. Be able to connect powers and roots.	Powers Roots Indices Multiplication Division	To be able to recognise and deal with large number in organisations, for example accountancy.
Autumn	Identify factors, multiples and prime numbers List all factors of a number and list multiples systematically Find the prime factor decomposition of positive integers and write as a product using index notation Find common factors and common multiples of two numbers Find the LCM and HCF of two numbers Solve simple problems using HCF, LCM and prime numbers Convert values into Standard Form and vice versa.	Factors, Multiples, Primes and Standard Form	Understand factors and multiples. To identify and use correctly prime numbers. Understand the use of standard form in large and small numbers.	Use and apply correctly factors and multiples extending to prime factor trees. Apply the laws of standard form and how they are used in calculations.	Prime factor decomposition. Venn diagrams connecting multiples and factors. Using correct notation for standard form.	Factors Multiples Prime Standard form Prime factor decomposition	The use of prime numbers in cyber-age security and encryption. Binary code.
Autumn	Use notation and symbols correctly Write an expression Select an expression/equation/formula/identity from a list Simplify algebraic expressions by collecting 'like' terms;	Basic Algebra	Understand and apply the correct format for the specific equations.	Use of algebraic notation Understanding of BIDMAS to be able to use the correct	Solving equations. Apply the use of brackets to complete the correct calculation.	Expression Equation Formula Algebraic Brackets	Using equation in medicine to adjust medication.

	Multiply together two simple algebraic expressions Simplify expressions by cancelling Use index notation when multiplying or dividing algebraic terms Use index laws in algebra		Recognise the terminology associated with the equation.	format to complete the equations correctly. Correctly apply the index laws to solve the equation.	Extend to using index laws to complete higher order equations.	Index laws	Calculating wages based on hourly pay rate.
Autumn	Expand a single bracket Expand and Simplify single brackets Factorise algebraic expressions by taking out common factors. Expanding double brackets (and more)	Expanding and Factorising Brackets	Understand that brackets in algebra and multiplication.	Correctly use multiplication to expand a single bracket. Correctly apply multiplication when expanding two brackets.	Correctly expand a single bracket. Correctly expand a double bracket and simplify the 'like' terms.	Expanding Brackets Common factors	Use in medicine trails to adjust medication so it is more controlled.
Spring	Write expressions to solve problems Substitute positive and negative numbers in algebraic expressions Substitute numbers into expressions involving brackets and powers Substitute numbers into a formula.	Expression and Substitution	Recognise that number is substituted for a letter in an equation. Be able to also use negative numbers.	Use number to replace a letter in an equation. Use of BIDMAS to ensure that the calculation is correct.	Be able to recognise the correct substitution and correctly apply the use of BIDMAS and negative numbers.	Substitution Positive Negative Expressions Brackets Powers	In controlled setting for example medicine and computer algorithms to adjust variables.
Spring	Design and use data-collection sheets Use correct notation for time Work out time taken for a journey from a timetable; Construct and Interpret two-way tables Interpret frequency tables.	Tables	Design a table to capture data. Use two-way tables to sort data and find specific probabilities	Design a data table to interpret information. Interpret a two-way table to find specific data groups. Present findings using probability.	Construct and interpret frequency tables to gather information and use it in a statistical format. Sort and apply two-way tables in order to look at	Frequency Table Two-way tables Collection	Data trial for companies to ensure that they are productive. Medical trials to establish if drugs are effective.

				Use a date sheet to interpret frequency of events.	specific groups and make evaluations.		
Spring	Construct and interpret pictograms Construct and interpret composite and dual bar charts Construct and interpret line graphs Construct and interpret stem and leaf diagrams Construct and interpret histograms with equal class intervals Interpret Real life graphs including speed distance time graphs.	Charts and Graphs	Understand and apply the correct scaling in the charts. Apply the correct number system when interpreting stem and leaf diagrams. Use the relationship between speed, distance, and time.	To be able to identify the correct table for bar charts and line graphs. Be able to use scale effectively in the different statistical measures.	Using the stem and leaf diagram to correctly give the averages. Link speed, distance and time to the real-life graphs and calculate SDT. Be able to construct the correct chart in examinations.	Pictogram Construct Bar chart Stem and leaf Intervals Graphs	Used extensively in the most businesses to show trends and sales in a more eye-catching format.
Spring	Measure and draw angles Construct pie charts Interpret simple pie charts Compare pie charts	Pie Charts	Understand that a circle has 360 degrees.	Use of a compass to draw the pie chart. Be able to accurately use an angle measurer.	To accurately be able to both draw and interpret the pie chart.	Measure Draw Construct Degrees Angle	Pie charts are used extensively in business to show comparisons between different data sets.
Spring	Draw scatter graphs Draw the line of best fit on a scatter diagram and use it to make predictions. Distinguish between positive, negative and no correlation Interpret scatter graphs in terms of the relationship between two variables; Interpret correlation.	Scatter Graphs	Accurate plotting to ensure that the data sets can be compared accurately.	Plot the two variables on the same axis. Use the rules of correlation to evaluate the data.	To be able to make an analysis of the variable to establish if a relation occurs.	Correlation Negative Positive Variable Relationship	Used in medicine to see if medication taken together has a negative or positive relationship.

			Understand the relationship for correlation. organisations				
Summer	Calculate the mean, mode, median and range for discrete data Calculate the median, mean and range from a (discrete) frequency table Calculate the range, modal class, interval containing the median, and estimate of the mean from a grouped data frequency table Calculate the median, mode and range from stem and leaf diagrams Compare the mean, median, mode and range (as appropriate) of two distributions Recognise the advantages and disadvantages between measures of average.	Averages	To understand the difference between the four average. To be able to apply the correct average depending on the chart required. Be able to accurately evaluate the statistical measure and give evaluations.	To establish the different measures with the four averages. Use the correct average to establish the correct evaluation.	Apply averages in frequency tables, grouped frequency and stem and leaf. Be able to compare the four averages and give a conclusion based on the statistical analysis.	Mean Medium Mode and Range Frequency Modal class Estimate Interval	Averages are widely used in all aspects of society. It is used in many to help with research.
Summer	Express a given number as a fraction of another Write a fraction in its simplest form and find equivalent fractions Order fractions, by using a common denominator Compare fractions Convert between mixed numbers and improper fractions Add and subtract fractions (including negatives) Multiply and divide an integer by a fraction; Multiply and divide a fraction by an integer Understand reciprocals Multiply fractions: simplify calculations by cancelling first (including negatives)	Fractions	Be able to use the rules of fractions to complete calculations. Understand reciprocals and how they are used in calculations.	Add and subtract fractions. Convert fractions into mixed numbers. Multiply and divide fractions using rules.	Add and subtract fractions. Convert fractions into decimals and mixed numbers. Divide and multiply fractions. Use reciprocals in calculations.	Fraction Denominator Improper Multiply Divide Integer Reciprocals	Fractions are in common use in society for a multitude of situations and it is common to see fractions in everyday life.

	Divide a fraction by a whole number; Divide fractions by fractions (including negatives)						
Summer	Convert between fractions and decimals Recognise recurring decimals and convert fractions Compare and order fractions Convert between fractions, decimals, and percentages; Order fractions, decimals and percentages, including use of inequality signs	Fractions, Decimals and Percentages	Convert between fractions, decimals, and percentages. Understand and apply the rules of recurring decimals.	Understand the relationship between decimals, fractions, and percentages. Be able to order fractions correctly. Use the inequalities sign to correctly identify fractions which are bigger than the other.	Compare fractions in order of size. Convert between fractions, decimals, and percentages. Inequalities in fractions, decimals, and percentages.	Fraction Decimal Percentage Inequality Recurring Convert	The use of fractions, decimals and percentages is widely used in all industries in society for multiple use.
Summer	Write expressions and set up simple equations Solve simple equations Solve linear equations in which the unknown appears on both sides of the equation; Solve linear equations which contain brackets Rearrange simple equations; Substitute into a formula, and solve the resulting equation Solve angle or perimeter problems using algebra. Write an equation to solve a word problem	Equations	To set up simple equations from worded questions. To solve linear equations expanding to unknown variables on both sides. Solve equations using bracket. Use equations in real life situations.	Solve equations using the rules. Expand brackets to solve equations. Use real life situations to apply the rules in order to solve the equations to find solutions.	Solve one unknown and two unknown equations. Expand brackets in order to solve equations. Use real life situations to solve problems using equations and substitution.	Equations Brackets Substitution Formula Linear	Equations and algebra are the foundation of critical thinking and problem solving in everyday life.

Subject Information including exam board details:

The key stage 3 curriculum is following the scheme of work for AQA. As part of the scaffolding, we use the white rose scheme to ensure that pupils are challenged and aiming for a good pass at GCSE. Pupils will be tested at the end of each term to monitor progress and ensure that pupils are achieving the correct level. If pupils are identified for under achievement, then intervention will be applied so that they can be given the support to help them gain more confidence and go on to achieve their potential.

Careers linked to this subject area:

Education, Engineering, Finance, Banking, Accountancy, Engineering, Economist, Data analysis, Electrical engineer, Meteorologist, software developer, Stockbroker

Enrichment Opportunities:

Enrichment is the **enhancement of mathematical experiences** and may feature the study of mathematics beyond the standard curriculum as defined by the requirements of any external examinations. Alternative and creative approaches to topics, including open-ended investigations. Accessible aspects of mathematics lying outside the curriculum.