Maths PoS: Year 8 HT1

Students will colour code as they work through the scheme of work,

Students will learn about… Number, Data Handling and Shape		
Grade 1-3	Grade 4-6	Grade 7-9
Students will: Identify pairs of factors for a number and common factors of 2 numbers. Calculate difference between a positive and negative number. Know the prime numbers less than 100 and understand they have only 2 factors. Find prime factors of a 2 digit number. Know square number up to 12x12. Construct a frequency table using a tally chart. Construct and interpret a pictogram. Construct and interpret a bar chart. Calculate median, mode, mean and range. Identify 2D shapes by using their properties. Recognise & construct parallel and perpendicular lines. Calculate angles on a straight line. Calculate angles in a triangle and round a point.	Students will: Calculate Highest Common Factor. Calculate Lowest Common Multiple. Add, subtract, multiply and divide integers. Use squares, positive and negative square roots, cubes and cube roots. Understand and evaluate indices. Know which average to use and why. Construct bar charts for discrete and continuous data. Construct and interpret pie chart for discrete and continuous data. Calculate the mean from a frequency table. Construct a scattergraph and comment on the relationship. Construct a stem and leaf diagram & find the median. Identify the rules for finding missing angles in parallel lines. Give reasons for angles in parallel lines and shapes. Understand and replicate the proof of angles in a triangle using parallel lines. Find angles in quadrilaterals. Measure and construct bearings.	Students will: Index notation with negative and fractional indices Represent fractional indices as roots and cube roots. Work through the entire data handling cycle. Plot cumulative frequency curves. Plot box plots. Calculate median and interquartile range from a cumulative frequency diagram and from a set of data. Find shorter and longer sides of a triangle using Pythagoras theorem. Find missing angles in polygons and combination using parallel lines. Know that the tangent at any point on a circle is perpendicular to the radius at that point. Explain why the perpendicular from the centre to the chord bisects the chord.
Assessment Topic tests, teacher professional judgement based upon classwork and homework.		

Maths PoS: Year 8 HT2

Students will colour code as they work through the scheme of work.

Students will learn about… Equations, Area and Volume		
Grade 1-3	Grade 4-6	Grade 7-9
Students will: Give a general statement to describe patterns in shape and number. Construct and use simple formulae (e.g. the cost of c pens at 15 pence each is 15c pence). Measure & calculate the perimeter of regular and irregular polygons. Calculate the area of a rectangle. Estimate the area of irregular shapes by counting squares. Plot coordinates in the first quadrant. Complete a shape in the first quadrant using coordinates and the properties of the shape. Identify and draw nets of 3D shapes.	Students will: Understand equations and their meaning. Expand two single brackets and collect like terms. Substitute numbers into expressions and formulae. Evaluate basic indices. Calculate the area of a triangle, parallelogram, and trapezium. Calculate area of compound shapes. Calculate the volume & surface area of cubes and cuboids. Find the missing side of a cuboid using the volume.	Students will: Know and use the index laws including $(2a^4)^3$. Expand 2 brackets e.g. $(2x + 3)(3x+2)$. Square a bracket. Establish identities such as $a^2 - b^2 = (a + b)(a - b)$. Calculate lengths of arc and area of sectors. Calculate surface area and volume of a cylinder.
Assessment Topic tests, teacher professional judgement based upon classwork and homework.		

Maths PoS: Year 8 HT3

Students will colour code as they work through the scheme of work.

Students will learn about… Sequences, Number, Probability		
Grade 1-3	Grade 4-6	Grade 7-9
Students will: Count on from any number in decimals. Extend a sequence into the negatives. Describe the rule connecting a sequence of numbers. Subtract numbers into the 1000's. Multiply and divide decimals using known multiplication facts. Use written methods to add and subtract numbers. Multiply (2 digits by 2digit) and divide numbers using written methods. Use a calculator to check calculations and find fractions of amounts. Use correct words to describe the likelihood of an event. Use data to predict the likelihood of an event.	Students will: Generate the nth term. Create a sequence using the nth term. Decide if a number is in a sequence using the nth term. Use **BIDMAS.** Recall basic fractions/decimals/percentages. Know basic squares, cubes and their respective roots. Use rounding to estimate an answer. Add, subtract, multiply, & divide integers and decimals using a written method. Use Power, roots, brackets and fraction button on the calculator. Understand probability adds up to one. Create diagrams and tables to calculate probability of two events. Compare theoretical and experimental probability to decide if an experiment is bias. Understand probability adds up to one. Create diagrams and tables to calculate probability of two events.	Students will: Calculate the nth term of a quadratic sequence. Use triangular and square numbers to predict spatial patterns. Round numbers to significant figures and apply in calculations. Recognise and use reciprocals. Know that any number multiplied by its reciprocal is 1. Convert between standard form numbers and ordinary numbers. Use standard form numbers on a calculator. Use reciprocal and trigonometry functions on a calculator. Calculate relative frequency and use to compare outcomes. Use tree diagrams to represent outcomes of 2 or more events. Use and apply the AND & OR rules.
Assessment Topic tests, teacher professional judgement based upon classwork and homework.		

Maths PoS: Year 8 HT4

Students will colour code as they work through the scheme of work.

Students will learn about… Ratio and Proportion, Functions and Graphs, Coordinates and Transformations		
Grade 1-3	Grade 4-6	Grade 7-9
Students will: Decrease or increase a recipe to feed certain number of people. Solve simple problems of proportion by doubling or trebling. Identify lines of symmetry. Reflect a shape in a vertical mirror line. Rotate a shape about its centre of using one of its corners (Vertices).	Students will: Simplify ratios with differing units. Divide an amount in a ratio of 2 or more numbers. Calculate the value of a single unit in ratio and proportion. Use ratio and proportion to calculate which item is a best buy. Plot any linear graph in all four quadrants. Know y = mx+c is a straight line graph. Plot and interpret distance time graphs. Translate a shape across a grid and write the translation. Rotate a shape about any coordinate. Reflect a shape in a basic graph mirror line. Enlarge a shape using a positive scale factor. Enlarge a shape from the centre of enlargement using a positive scale factor. Identify congruent shapes.	Students will: Calculate the original amount after a percentage change. Understand and use proportionality and calculate the result of any proportional change. Calculate the gradient of a graph line. Construct and interpret time series graphs. Plot quadratic and cubic graphs. Plot the graph of an inverse of a linear function. Plot perpendicular graphs and see the connection. Transform a 2D shape using multiply transformations. Understand translations are written as a vector. Enlarge 2D shapes by positive, negative and fractional scale factors. Understand the effect of enlargement on area and perimeter. Understand from this that any two circles and any two squares are mathematically similar while in general any two rectangles are not.
Assessment Topic tests, teacher professional judgement based upon classwork and homework.		

Maths PoS: Year 8 HT5

Students will colour code as they work through the scheme of work.

Students will learn about… Shape, Algebra and Number		
Grade 1-3	Grade 4-6	Grade 7-9
Students will: Compare and evaluate approaches; recognise equivalent approaches. Take account of feedback and learn from mistakes. Understand and use the language and notation associated with reflections, translations and rotations. Recognise and visualise the symmetries of a 2-D shape. Transform 2-D shapes by: reflecting in given mirror lines; rotating about a given point; translating. Interpret information from a mathematical representation or context. Know the meanings of the words *term*, *expression* and *equation.* Construct and solve simple linear equations with integer coefficients (unknown on one side only) using an appropriate method (e.g. inverse operations). Express a smaller whole number as a fraction of a larger one; simplify fractions by cancelling all common factors and identify equivalent fractions; convert terminating decimals to fractions, e.g. 0.23 = 23/100; use diagrams to compare two or more simple fractions. Add & subtract simple fractions and those with common denominators; calculate simple fractions of quantities & measurements (whole-number answers); multiply a fraction by an integer.	Students will: Manipulate algebraic equations. Recognise that letter symbols play different roles in equations, formulae and functions. Construct and solve linear equations with integer coefficients (unknown on either or both sides, without and with brackets) using appropriate methods (e.g. inverse operations, transforming both sides in same way). Use graphs and set up equations to solve simple problems involving direct proportion. Substitute integers into simple formulae, including examples that lead to an equation to solve. Make connections with related contexts. Estimate, approximate and check working. Recognise that a recurring decimal is a fraction; use division to convert a fraction to a decimal; order fractions by writing them with a common denominator or by converting them to decimals. Add and subtract fractions by writing them with a common denominator; calculate fractions of quantities (fraction answers); multiply and divide an integer by a fraction. Interpret percentage as the operator 'so many hundredths of' and express one given number as a percentage of another; calculate percentages and find the outcome of a given percentage increase or decrease. Use the equivalence of fractions, decimals and percentages to compare proportions.	Students will: Distinguish between fractions with denominators that have only prime factors 2 or 5 (terminating decimals), and other fractions (recurring decimals). Understand and apply efficient methods to add, subtract, multiply and divide fractions, interpreting division as a multiplicative inverse. Solve problems involving surface areas and volumes of cylinders. Manipulate algebraic expressions and equations. Derive and use more complex formulae; change the subject of a formula, including cases where a power of the subject appears in the question or solution, e.g. find r given that $A = \pi r^2$. Make sense of, and judge the value of, own findings and those presented by others. Find the points that divide a line in a given ratio, using the properties of similar triangles; calculate the length of AB, given the coordinates of points A and B. Understand and use trigonometric relationships in right-angled triangles, and use these to solve problems, including those involving bearings.

Understand percentage as the 'number of parts per 100'; calculate simple percentages and use percentages to compare simple proportions. Recognise the equivalence of percentages, fractions and decimals.	Use formulae from mathematics and other subjects; substitute integers into simple formulae, including examples that lead to an equation to solve; substitute positive integers into expressions involving small powers, e.g. $3x^2 + 4$ or $2x^3$; derive simple formulae. Simplify or transform linear expressions by collecting like terms; multiply a single term over a bracket. Construct & solve linear equations with integer coefficients (unknown on either or both sides) using appropriate methods (e.g. inverse operations, transforming both sides in the same way). Identify the mathematical features of a context or problem. Express simple functions algebraically and represent them in mappings or on a spreadsheet. Generate points in all four quadrants and plot the graphs of linear functions, where y is given explicitly in terms of x, on paper and using ICT; recognise that equations of the form $y = mx + c$ correspond to straight-line graphs. Construct linear functions arising from real-life problems and plot their corresponding graphs; discuss and interpret graphs arising from real situations, e.g. distance–time graphs	
Assessment **Topic tests and end of year assessment**, teacher professional judgement based upon classwork and homework.		

Students will colour code as they work through the scheme of work.

Students will learn about… Number, Shape and Data Handling		
Grade 1-3	Grade 4-6	Grade 7-9
Students will: Record methods, solutions and conclusions. Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1000, and explain the effect. Compare and order decimals in different contexts; know that when comparing measurements the units must be the same. Round positive whole numbers to the nearest 10, 100 or 1000, and decimals to the nearest whole number or one decimal place. Use the order of operations, including brackets. Strengthen and extend mental methods of calculation to include decimals, fractions and percentages, accompanied where appropriate by suitable jottings; solve simple problems mentally. Multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers. Check results by considering whether they are of the right order of magnitude and by working problems backwards. Use a ruler and protractor to: (i) measure and draw lines to the nearest millimetre and angles, including reflex angles, to the nearest degree; construct a triangle given two sides and the included angle (SAS) or two angles and the included side (ASA).	Students will: Give accurate solutions appropriate to the context or problem. Read and write positive integer powers of 10; multiply and divide integers and decimals by 0.1, 0.01 Order decimals. Round positive numbers to any given power of 10; round decimals to the nearest whole number or to one or two decimal places. Make and justify estimates and approximations of calculations. Strengthen and extend mental methods of calculation, working with decimals, fractions, percentages, squares and square roots, and cubes and cube roots; solve problems mentally. Use efficient written methods for multiplication and division of integers and decimals, including by decimals such as 0.6 or 0.06; understand where to position the decimal point by considering equivalent calculations. Select from a range of checking methods, including estimating in context and using inverse operations. Visualise 3-D shapes from their nets; use geometric properties of cuboids and shapes made from cuboids; use simple plans and elevations. Make scale drawings. Find the midpoint of the line segment AB, given the coordinates of points A and B.	Students will: Interpret and explore combining measures into rates of change in everyday contexts (e.g. km per hour, pence per metre); use compound measures to compare in real-life contexts (e.g. travel graphs and value for money), using ICT as appropriate. Understand and use measures of speed (and other compound measures such as density or pressure); solve problems involving constant or average rates of change Use a range of forms to communicate findings effectively to different audiences. Explain the features selected and justify the choice of representation in relation to the context. • Independently devise a suitable plan for a substantial statistical project and justify the decisions made. • • Identify possible sources of bias and plan how to minimise it. • Break a task down into an appropriate series of key statements (hypotheses), and decide upon the best methods for testing these • gather data from primary and secondary sources, using ICT and other methods, including data from observation, controlled experiment, data logging, printed tables and lists. • • Analyse data to find patterns and exceptions, and try to explain anomalies; include social statistics such as index numbers, time series and survey data. •

	Visualise and manipulate dynamic images. Make accurate mathematical constructions on paper and on screen. Find simple loci, both by reasoning and by using ICT, to produce shapes and paths, e.g. an equilateral triangle. Use straight edge and compasses to construct; (i) the mid-point and perpendicular bisector of a line segment; (ii) the bisector of an angle; (iii) the perpendicular from a point to a line; (iv) the perpendicular from a point on a line (v) a triangle, given three sides (SSS)	• Appreciate that correlation is a measure of the strength of association between two variables; distinguish between positive, negative and zero correlation, using lines of best fit; appreciate that zero correlation does not necessarily imply 'no relationship' but merely 'no linear relationship'. • Examine critically the results of a statistical enquiry; justify choice of statistical representations and relate summarised data to the questions being explored.

Assessment

Topic tests and end of year assessment, teacher professional judgement based upon classwork and homework.