

Year 7

HT topic	HT1 Topic/Unit: Place Value and Proportion	HT2 Topic/Unit: Reasoning with Number	HT3 Topic/Unit: Applications of number	HT4 Topic/Unit: Applications of number	HT5 Topic/Unit: Directed Number and Algebraic Thinking	HT6 Topic/Unit: Algebraic Thinking and Directed Number
<p>Key Content:</p>	<p>Place value ordering integers and decimals</p> <ul style="list-style-type: none"> Recognise the place value of any digit in an integer up to one billion Understand and write integers up to one billion in words and figures Work out intervals on a number line Position integers on a number line Round intervals to the nearest power of 10 Compare two numbers using =, ≠, <, >, ≤ and ≥ Order a list of integers Find the range of a set of numbers Find the median of a set of numbers Understand place value for decimals Position decimals on a number line Compare and order any number up to one billion Round a number to 1 significant figure H - Write 10, 100, 1000 etc as powers of 10 H - Write positive integers in the form $A \times 10^n$ H - Investigate negative powers of 10 H - Write decimals in the form $A \times 10^{-n}$ 	<p>Prime numbers and proof</p> <ul style="list-style-type: none"> Find and use multiples Identify factors of numbers and expressions Recognise and identify prime numbers Recognise square and triangular numbers Find common factors of a set of numbers including the HCF Find common multiples of a set of numbers including the LCM Write a number as a product of its prime factors H - Use a Venn diagram to calculate the HCF and LCM Make and test conjectures Use counterexamples to disprove a conjecture 	<p>Solving problems with addition and subtraction</p> <ul style="list-style-type: none"> Properties of addition and subtraction Mental strategies for addition and subtraction Use formal methods for addition of integers Use formal methods for addition of decimals Use formal methods for subtraction of integers Use formal methods for subtraction of decimals Choose the most appropriate method: mental strategies, formal written or calculator Solve problems in the context of perimeter Solve financial maths problems Solve problems involving tables and timetables Solve problems with frequency trees Solve problems with bar charts and line charts H - Add and subtract numbers given in standard form 	<p>Solving problems with multiplication and division</p> <ul style="list-style-type: none"> Properties of multiplication and division Understand and use factors and multiples Multiply and divide integers and decimals by powers of 10 H - Multiply by 0.1 and 0.01 Convert metric units Use formal methods to multiply integers Use formal methods to multiply decimals Use formal methods to divide integers Use formal methods to divide decimals Understand and use order of operations Solve problems using the area of rectangles and parallelograms Solve problems using the area of triangles H - Solve problems using the area of trapezia Solve problems using the mean H - Explore multiplication and division in algebraic expressions 	<p>Operations and equations with directed number (A)</p> <ul style="list-style-type: none"> Understand and use representations of directed numbers Order directed numbers using lines and appropriate symbols Perform calculations that cross zero Add directed numbers Subtract directed numbers Multiplication of directed numbers Multiplication and division of directed numbers Use a calculator for directed number calculations Evaluate algebraic expressions with directed number Introduction to two-step equations Solve two-step equations Use order of operations with directed numbers H - Understand that positive numbers have more than one square root H - Explore higher powers and roots <p>Understand and use algebraic notation</p> <ul style="list-style-type: none"> Given a numerical input, find the output of a single function machine Use inverse operations to find the input given the output Use diagrams and letters to generalise number operations Use diagrams and letters with single function machines Find the function machine given a simple expression Substitute values into single operation expressions Find numerical inputs and outputs for a series of two function machines Use diagrams and letters with a series of two function machines Find the function machine given a two-step expression Substitute values into two-step expressions Generate sequences given an algebraic rule Represent one- and two-step functions graphically 	<p>Equality and equivalence</p> <ul style="list-style-type: none"> Understand the meaning of equality Understand and use fact families, numerically and algebraically Solve one-step linear equations involving addition and subtraction using inverse operations Solve one-step linear equations involving multiplication and division using inverse operations Understand the meaning of like and unlike terms Understand the meaning of equivalence Simplify algebraic expressions by collecting the like term using the \equiv symbol <p>Operations and equations with directed number (B)</p> <ul style="list-style-type: none"> Understand and use representations of directed numbers Order directed numbers using lines and appropriate symbols Perform calculations that cross zero Add directed numbers Subtract directed numbers Multiplication of directed numbers Multiplication and division of directed numbers Use a calculator for directed number calculations Evaluate algebraic expressions with directed number Introduction to two-step equations Solve two-step equations Use order of operations with directed numbers H - Understand that positive numbers have more than one square root H - Explore higher powers and roots

Year 8

HT topic	HT1 Topic/Unit: Fractional Thinking	HT2 Topic/Unit: Proportional Reasoning	HT3 Topic/Unit: Lines and Angles	HT4 Topic/Unit: Lines and Angles	HT5 Topic/Unit: Place Value and Proportion	HT6 Topic/Unit: Sets and probability
<p>Key Content:</p>	<p>Addition and subtraction of fractions</p> <ul style="list-style-type: none"> Understand representations of fractions Convert between mixed numbers and fractions Add and subtract unit fractions with the same denominator Add and subtract fractions with the same denominator Add and subtract fractions from integers expressing the answer as a single fraction Understand and use equivalent fractions Add and subtract fractions where denominators share a simple common multiple Add and subtract fractions with any denominator Add and subtract improper fractions and mixed numbers Use fractions in algebraic contexts Use equivalence to add and subtract decimals and fractions H - Add and subtract simple algebraic fractions 	<p>Multiplying and dividing fractions</p> <ul style="list-style-type: none"> Represent multiplication of fractions Multiply a fraction by an integer Find the product of a pair of unit fractions Find the product of a pair of any fractions Divide an integer by a fraction Divide a fraction by a unit fraction Understand and use the reciprocal Divide any pair of fractions H - Multiply and divide improper and mixed fractions H - Multiply and divide algebraic fractions <p>Reasoning with Number</p> <p>Developing number sense</p> <ul style="list-style-type: none"> Know and use mental addition and subtraction strategies for integers Know and use mental multiplication and division strategies for integers Know and use mental strategies for decimals Know and use mental strategies for fractions Use factors to simplify calculations Use estimation as a method for checking mental calculations Use known number facts to derive other facts Use known algebraic facts to derive other facts Know when to use a mental strategy, formal written method or a calculator 	<p>Constructing, measuring and using geometric notation</p> <ul style="list-style-type: none"> Understand and use letter and labelling conventions including those for geometric figures Draw and measure line segments including geometric figures Understand angles as a measure of turn Classify angles Measure angles up to 180 degrees. Draw angles up to 180 degrees. Draw and measure angles between 180 and 360 degrees Identify parallel and perpendicular lines. Recognise types of triangles Identify polygons up to decagons. Recognise types of quadrilaterals Construct triangles using SSS Construct triangles using SSS, SAS and ASA Construct more complex polygons Interpret simple pie charts using proportion Interpret pie charts using a protractor Draw pie charts 	<p>Developing geometric reasoning</p> <ul style="list-style-type: none"> Understand and use the sum of angles at a point Understand and use the sum of angles on a straight line Understand and use the equality of vertically opposite angles Know and apply the sum of angles in a triangle Know and apply the sum of angles in a quadrilateral Solve angle problems using properties of triangles and quadrilaterals Solve complex angle problems H - Find and use the angle sum of any polygon H - Investigate angles in parallel lines H - Understand and use parallel line angle rules H - Use known facts to obtain simple proofs 	<p>Fraction, decimal and percentage equivalence</p> <ul style="list-style-type: none"> Represent tenths and hundredths as diagrams Represent tenths and hundredths on number lines Interchange between fractional and decimal number lines Convert between fractions and decimals - tenths and hundredths Convert between fractions and decimals - fifths and quarters H - Convert between fractions and decimals - eighths and thousandths Understand the meaning of percentage using a hundred square Convert fluency between simple fractions, decimals and percentages Use and interpret pie charts Represent any fraction as a diagram Represent fractions on number lines Identify and use simple equivalent fractions Simplify fractions (no small step on this - but this is in the assessment) Understand fractions as division Convert fluently between FDP H - Explore fractions above one, decimals and percentages 	<p>Sets and probability</p> <ul style="list-style-type: none"> Identify and represent sets Interpret and create Venn diagrams Understand and use the intersection of sets Understand and use the union of sets H - Understand and use the complement of sets Know and use the vocabulary of probability Generate sample spaces for single events Calculate the probability of a single event Understand and use the probability scale Know that the sum of probabilities of all possible outcomes is 1 <p>Tables & Probability</p> <ul style="list-style-type: none"> Construct sample spaces for 1 or more events Find probabilities from sample space Find probabilities from two-way tables Find probabilities from Venn diagrams H - Use the product rule for finding the total number of possible outcomes

Year 9

HT topic	HT1 Topic/Unit: Proportional Reasoning	HT2 Topic/Unit: Representations and Algebraic Techniques	HT3 Topic/Unit: Algebraic Thinking and Algebraic Techniques	HT4 Topic/Unit: Developing Number	HT5 Topic/Unit: Developing Geometry	HT6 Topic/Unit: Reasoning with Data
Key Content:	<p>Ratio and scale</p> <ul style="list-style-type: none"> Understanding the meaning and representation of ratio Understand and use ratio notation Solve problems involving ratios of the form 1:n or n:1 Solve proportional problems involving the ratio m:n Divide a value into a given ratio Express ratios in their simplest integer form H - Express ratios in the form 1:n Compare ratios and related fractions Understand pi as the ratio between diameter and circumference H - Understand gradient of a line as a ratio <p>Multiplicative change</p> <ul style="list-style-type: none"> Solve problems involving direct proportion Explore conversion graphs Convert between currencies H - Explore direct proportion graphs Explore relationships between similar shapes Understand scale factors as multiplicative relationships Draw and interpret scale diagrams Interpret maps using scale factors and ratio <p>Representations</p> <p>Working in the Cartesian plane</p> <ul style="list-style-type: none"> Work with coordinates in all four quadrants Identify and draw lines that are parallel to the axes Recognise and use the line $y=x$ Recognise and use lines of the form $y=kx$ Link $y=kx$ to direct proportion problems H - Explore the gradient of the line $y=kx$ Recognise and use lines of the form $y=x+a$ Explore graphs with negative gradients ($y=-kx$, $y=a-x$, $x+y=a$) Link graphs to linear sequences Plot graphs of the form $y=mx+c$ H - Explore non-linear graphs H - Find the midpoint of a line segment 	<p>Representing data</p> <ul style="list-style-type: none"> Draw and interpret scatter graphs Understand and describe linear correlation Draw and use line of best fit (1) Draw and use line of best fit (2) Identify non-linear relationships Identify different types of data Read and interpret ungrouped frequency tables Read and interpret grouped frequency tables Represent grouped discrete data Represent continuous data grouped into equal classes Represent data in two-way tables <p>Brackets, equations and inequalities</p> <ul style="list-style-type: none"> Form algebraic expressions Use directed number with algebra Multiply out a single bracket Factorise into a single bracket Expand multiple single brackets and simplify H - Expand a pair of binomials Solve equations, including with brackets Form and solve equations with brackets Understand and solve simple inequalities Form and solve inequalities H - Solve equations and inequalities with unknowns on both sides H - Form and solve equations and inequalities with unknowns on both sides Identify and use formulae, expressions, identities and equations 	<p>Sequences</p> <ul style="list-style-type: none"> Describe and continue a sequence given diagrammatically Predict and check the next term(s) of a sequence Represent sequences in tabular and graphical forms Recognise the difference between linear and non-linear sequences Continue numerical linear sequences Continue numerical non-linear sequences Explain the term-to-term rule of numerical sequences in words H - Find missing numbers within sequences <p>Indices</p> <ul style="list-style-type: none"> Adding and subtracting expressions with indices Simplifying algebraic expressions by multiplying indices Simplifying algebraic expressions by dividing indices Using the addition law for indices Using the addition and subtraction laws for indices H - Exploring powers of powers 	<p>Fractions and percentages</p> <ul style="list-style-type: none"> Convert between decimals and percentages more than 1/100% Percentage decrease with a multiplier Calculate percentage increase and decrease using a multiplier Express one number as a fraction or a percentage of another without a calculator Express one number as a fraction or a percentage of another using calculator methods Work with percentage change Choose appropriate methods to solve percentage problems H - Find the original amount given the percentage less than 100% H - Find the original amount given the percentage more than 100% H - Choose appropriate methods to solve complex percentage problems <p>Standard index form</p> <ul style="list-style-type: none"> Work with numbers greater than 1 in standard form Investigate negative powers of 10 Work with numbers between 0 and 1 in standard form Compare and order numbers in standard form Mentally calculate with numbers in standard form Add and subtract numbers in standard form Multiply and divide numbers in standard form Use a calculator to work with numbers in standard form H - Understand and use negative indices H - Understand and use fractional indices <p>Number sense</p> <ul style="list-style-type: none"> Round numbers to a number of decimal places H - Understand and use error interval notation Calculate with money Convert metric units of weight and capacity H - Convert metric units of area H - Convert metric units of volume Solve problems involving time and the calendar 	<p>Angles in parallel lines and polygons</p> <ul style="list-style-type: none"> REVIEW STEP - Understand basic angle rules and notation Investigate angles between parallel lines and the transversal Identify and calculate with alternate and corresponding angles Identify and calculate with co-interior, alternate and corresponding angles Solve complex problems with parallel line angles Construct triangles and special quadrilaterals Identify and calculate with sides and angles in special quadrilaterals. H - Understand and use the properties of diagonals of quadrilaterals Understand and use the sum of exterior angles of any polygon Understand and use the sum of interior angles of any polygon Calculate missing interior angles in regular polygons H - Prove simple geometric facts H - Construct an angle bisector H - Construct a perpendicular bisector of a line segment <p>Area of trapezia and circles</p> <ul style="list-style-type: none"> Calculate the area of triangles, rectangles and parallelograms Calculate the area of a trapezium Calculate the perimeter and area of compound shapes (1) REVIEW: Calculate the circumference of a circle Investigate the area of a circle Calculate the area of a circle and parts of a circle without a calculator Calculate the area of a circle and parts of a circle with a calculator Calculate the perimeter and area of compound shapes (2) <p>Line symmetry and reflection</p> <ul style="list-style-type: none"> Recognise line symmetry Reflect a shape in a horizontal or vertical line 1 (shapes touching the line) Reflect a shape in a horizontal or vertical line 2 (shapes not touching the line) Reflect a shape in a diagonal line 1 (shapes touching the line) Reflect a shape in a diagonal line 2 (shapes not touching the line) 	<p>The data handling cycle</p> <ul style="list-style-type: none"> Set up a statistical enquiry Design and criticise questionnaires Draw and interpret pictograms, bar charts and vertical line charts Draw and interpret multiple bar charts Draw and interpret pie charts Draw and interpret line graphs Choose the most appropriate diagram for given set of data Represent and interpret grouped quantitative data Find and interpret the range Represent and interpret grouped quantitative data Find and interpret the range <p>Measures of location</p> <ul style="list-style-type: none"> Understand and use the mean, median and mode Choose the most appropriate average H - Find the mean from an ungrouped frequency table H - Find the mean from a grouped frequency table Identify outliers Compare distributions using averages and the range