# Mapping Cambridge Secondary 1 Mathematics (Stages 7–9) to Florida Mathematics Standards (Grades 6–8)

## Introduction

Cambridge International Examinations has mapped the Cambridge Secondary 1 Mathematics (Stages 7–9) to Florida Mathematics Standards (Grades 6–8). This mapping document shows where the Florida Mathematics standards are covered in the Cambridge Secondary 1 Mathematics Framework and schemes of work.

**The Cambridge Secondary 1 Framework** provides a comprehensive set of progressive learning objectives for Mathematics. The objectives detail what the learner should know or what they should be able to do in Mathematics in Stages 7 to 9 (the equivalent of the US Grades 6 to 8) of secondary education. They provide a structure for teaching and learning and a reference against which learners' ability and understanding can be checked. Each learning objective has a unique curriculum framework code, e.g. **7Nf5**. These codes appear in the Cambridge Teacher Guide, schemes of work and other published resources. Codes in red indicate where learning objectives are mapped to a different grade from the equivalent Cambridge stage, e.g. where **8Nc7** (Cambridge Stage 8) is mapped to Grade 6 (rather than Grade 7). Cambridge learning objectives may be mapped to more than one Florida grade.

*Cambridge Secondary 1 Mathematics Teacher Guide* Appendix – Opportunities for ICT outlines where in the Cambridge Secondary 1 Curriculum Framework opportunities for using ICT may be used if the equipment is available. A copy of the Teacher Guide and scheme of work, can be found at https://cambridgesecondary1.cie.org.uk/

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| **RATIOS & PROPORTIONAL RELATIONSHIPS** | | |
| **MAFS.6.RP.1.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* | **7Nf9** Recognise the relationship between ratio and proportion. | Unit 3A Number and Calculation |
| **MAFS.6.RP.1.2** Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* | **7Nf8** Use ratio notation, simplify ratios and divide a quantity into two parts in a given ratio. | Unit 3A Number and Calculation |
| **MAFS.6.RP.1.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.<br><br>a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.<br>b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*<br><br>c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. | **7Nf10** Use direct proportion in context; solve simple problems involving ratio and direct proportion.<br><br>**7Nf5** Understand percentage as the number of parts in every 100; use fractions and percentages to describe parts of shapes, | Unit 3A Number and Calculation<br><br>Unit 2A Number and Calculation |

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| | quantities and measures. | |
| d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. | **8Nc7** Recall relationships between units of measurement. | Stage 8 Unit 1A Number and Calculation |
| | **7Nf1** Recognise the equivalence of simple fractions, decimals and percentages. | Unit 1A Number and Calculation |
| | **8Nc3** Recall simple equivalent fractions, decimals and percentages. | Stage 8 Unit 1A Number and Calculation |
| | **7Nf6** Calculate simple percentages of quantities (whole number answers) and express a smaller quantity as a fraction or percentage of a larger one. | Unit 3A Number and Calculation |
| | **7Nf7** Use percentages to represent and compare different quantities. | Unit 3A Number and Calculation |
| e. Understand the concept of Pi as the ratio of the circumference of a circle to its diameter. | **8Ma1** *Know the definition of a circle and the names of its parts; know and use formulae for the circumference* and area of a circle. | Stage 8 Unit 3C Handling Data and Measure |
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| **MAFS.6.NS.1.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?* | **8Nc4** Use known facts and place value to multiply and divide simple fractions.<br><br>**8Nc6** Use known facts and place value to calculate simple fractions and percentages of quantities. | Stage 8 Unit 3A Number and Calculation<br><br>Stage 8 Unit 2A Number and Calculation |
| **MAFS.6.NS.2.2** Fluently divide multi-digit numbers using the standard algorithm. | **7Nc1** Consolidate the rapid recall of number facts, including positive integer complements to 100, multiplication facts to 10 × 10 and associated division facts.<br><br>**8Ni1** Add, subtract, multiply and divide integers. | Unit 1A Number and Calculation<br><br>Stage 8 Unit 1A Number and Calculation |
| **MAFS.6.NS.2.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. | **7Np1** Interpret decimal notation and place value; multiply and divide whole numbers and decimals by 10, 100 or 1000.<br><br>**7Nc8** Add and subtract integers and decimals, including numbers with different numbers of decimal places.<br><br>**7Nc9** Multiply and divide decimals with one and/or two places by single-digit numbers, e.g. 13.7 × | Unit 1A Number and Calculation<br><br>Unit 3A Number and Calculation<br><br>Unit 3A Number and Calculation |

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| | 8, 4.35 ÷ 5. | |
| | **8Nc5** Use known facts and place value to multiply and divide simple decimals, e.g. 0.07 × 9, 2.4 ÷ 3. | Stage 8 Unit 2A Number and Calculation |
| | **8Np1** Read and write positive integer powers of 10; multiply and divide integers and decimals by 0.1, 0.01. | Stage 8 Unit 1A Number and Calculation |
| | **8Np3** Round whole numbers to a positive integer power of 10, e.g. 10, 100, 1000 or decimals to the nearest whole number or one or two decimal places. | Stage 8 Unit 1A Number and Calculation |
| | **8Nc11** Consolidate adding and subtracting integers and decimals, including numbers with differing numbers of decimal places. | Stage 8 Unit 2A Number and Calculation |
| | **8Nc12** Divide integers and decimals by a single-digit number, continuing the division to a specified number of decimal places, e.g. 68 ÷ 7. | Stage 8 Unit 2A Number and Calculation |
| | **8Nc13** Multiply and divide integers and decimals by decimals such as 0.6 or 0.06, understanding where to place the | Stage 8 Unit 3A Number and Calculation |

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| | decimal point by considering equivalent calculations, e.g. 4.37 × 0.3 = (4.37 × 3) ÷ 10, 92.4 ÷ 0.06 = (92.4 × 100) ÷ 6. | |
| **MAFS.6.NS.2.4** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).* | **7Ni2** Recognise multiples, factors, common factors, primes (all less than 100), making use of simple tests of divisibility; find the lowest common multiple in simple cases; use the 'sieve' for generating primes developed by Eratosthenes. | Unit 2A Number and Calculation |
| | **8Ni2** Identify and use multiples, factors, common factors, highest common factors, lowest common multiples and primes; write a number in terms of its prime factors, e.g. 500 = $2^2 \times 5^3$. | Stage 8 Unit 1A Number and Calculation |
| | **7Nf2** Simplify fractions by cancelling common factors and identify equivalent fractions; change an improper fraction to a mixed number, and vice versa; convert terminating decimals to fractions, e.g. 0.23 = $^{23}/_{100}$. | Unit 1A Number and Calculation |
| | **7Nc10** Know that in any division where the dividend is not a multiple of the divisor there will be | Unit 3A Number and Calculation |

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| | a remainder, e.g. 157 + 25 = 6 remainder 7. The remainder can be expressed as a fraction of the divisor, e.g. 157 ÷ 25 = $6^{7}/_{25}$. | |
| **MAFS.6.NS.3.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. | **7Ni1** Recognise negative numbers as positions on a number line, and order, add and subtract positive and negative integers in context. | Unit 1A Number and Calculation |
| **MAFS.6.NS.3.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. | **7Ni3** Recognise squares of whole number to at least 20 × 20 and the corresponding square roots; use the notation $7^2$ and $\sqrt{49}$. | Unit 2A Number and Calculation |
| a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite. | **7Ni1** Recognise negative numbers as positions on a number line, and order, add and subtract positive and negative integers in context. | Unit 1A Number and Calculation |
| b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. | **7Gp2** Transform 2D points and shapes by:<br>- reflection in a given line<br>- rotation about a given point<br>- translation<br>Know that shapes remain congruent after these transformations. | Unit 3C Handling Data and Geometry |
| c. Find and position integers and other rational numbers on a horizontal or | **7Gp1** Read and plot coordinates | Unit 3C Handling Data and |

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| vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. | of points determined by geometrical information in all four quadrants. | Geometry |
| **MAFS.6.NS.3.7** Understand ordering and absolute value of rational numbers.<br>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.*<br>b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 °C > –7 °C to express the fact that –3 °C is warmer than –7 °C.*<br>c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write \|–30\| = 30 to describe the size of the debt in dollars.*<br>d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.* | **7Np2** Order decimals including measurements, changing these to the same units.<br>**8Np2** Order decimals, including measurements, making use of the =, ≠, > and < signs.<br>**8Np3** Round whole numbers to a positive integer power of 10, e.g. 10, 100, 1000 or decimals to the nearest whole number or one or two decimal places. | Unit 1A Number and Calculation<br>Stage 8 Unit 1A Number and Calculation<br>Stage 8 Unit 1A Number and Calculation |
| **MAFS.6.NS.3.8** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. | **7Mt1** Draw and interpret graphs in real life context involving more than one stage, e.g. travel graphs. | Unit 3B Measure |

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| | **7Gp1** Read and plot coordinates of points determined by geometric information in all four quadrants. | Unit 3C Handling Data and Geometry |
| | **8As4** Construct tables of values and use all four quadrants to plot the graphs of linear functions, where *y* is given explicitly in terms of *x*; recognise that equations of the form $y = mx + c$ correspond to straight-line graphs. | Stage 8 Unit 2B Algebra and Geometry |
| | **7Nc11** Know when to round up or down after division when the context requires a whole-number answer. | Unit 2A Number and Calculation |
| | **7Np3** Round whole numbers to the nearest 10, 100 or 1000 and decimals, including measurements, to the nearest whole number or one decimal place. | Unit 1A Number and Calculation |
| **EXPRESSIONS & EQUATIONS** | | |
| **MAFS.6.EE.1.1** Write and evaluate numerical expressions involving whole-number exponents. | **7Ae6** Substitute positive integers into simple linear expressions/formulae. | Unit 2B Algebra and Measure |

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| **MAFS.6.EE.1.2** Write, read, and evaluate expressions in which letters stand for numbers.<br><br>a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*<br>b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*<br>c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.* | **7Ae1** Use letters to represent unknown numbers or variables; know the meanings of the words *term*, *expression* and *equation*.<br><br>**7Ae3** Construct simple algebraic expressions by using letters to represent numbers.<br><br>**7Ae2** Know that algebraic operations follow the same order as arithmetic operations. | Unit 1B Algebra and Measure<br><br>Unit 1B Algebra and Measure<br><br>Unit 1B Algebra and Measure |
| **MAFS.6.EE.1.3** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* | **7Ae4** Simplify linear expressions, e.g. collect like terms; multiply a constant over a bracket. | Unit 1B Algebra and Measure |
| **MAFS.6.EE.1.4** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.* | | |

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| **MAFS.6.EE.2.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | **7Ae7** Construct and solve simple linear equations with integer coefficients (unknown on one side only), e.g. $2x = 8$, $3x + 5 = 14$, $9 – 2x = 7$. | Unit 2B Algebra and Measure |
| **MAFS.6.EE.2.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. | **7Ae3** Construct simple algebraic expressions by using letters to represent numbers. | Unit 1B Algebra and Measure |
| | **7As3** Represent simple functions using words, symbols and mappings. | Unit 2B Algebra and Measure |
| | **7As1** Generate terms of an integer sequence and find a term given its position in the sequence; find simple term-to-term rules. | Unit 1B Algebra and Measure |
| | **7As2** Generate sequences from spatial patterns and describe the general term in simple cases. | Unit 1B Algebra and Measure |
| **MAFS.6.EE.2.7** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all non-negative rational numbers. | **7Ae5** Derive and use simple formulae, e.g. to change hours to minutes. | Unit 2B Algebra and Measure |
| **MAFS.6.EE.2.8** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. | | |

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| **MAFS.6.EE.3.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.* | **7As4** Generate coordinate pairs that satisfy a linear equation, where y is given explicitly in terms of x; plot the corresponding graphs; recognise straight-line graphs parallel to the x- or y-axis. | Unit 2B Algebra and Measure |
| **GEOMETRY** | | |
| **MAFS.6.G.1.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. | **7Ma4** Calculate the area of cubes and cuboids from their nets.<br><br>**7Ma2** Derive and use formulae for the area and perimeter of a rectangle; calculate the perimeter and area of compound shapes made from rectangles.<br><br>**7Gs2** Use the notation and labelling conventions for points, lines, angles and shapes.<br><br>**8Gs6** Solve geometrical problems using properties of angles, of parallel and intersecting lines, and of triangles and special quadrilaterals, explaining reasoning with diagrams and text. | Unit 3B Measure<br><br>Unit 2B Algebra and Measure<br><br>Unit 1C Handling Data and Geometry<br><br>Unit 3B Algebra and Geometry |

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| **MAFS.6.G.1.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. | **7Ma3** Derive and use formula for the volume of a cuboid; calculate volumes of cuboids. | Unit 3B Measure |
| **MAFS.6.G.1.3** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. | | This content is not explicitly referenced but could be integrated into Unit 1C, 2C or 3C Handling Data and Geometry. |
| **MAFS.6.G.1.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. | **7Gs1** Identify, describe, visualise and draw 2D shapes in different orientations.<br><br>**9Gs3** Draw 3D shapes on isometric paper. | Unit 1C Handling Data and Geometry<br><br>Stage 9 Unit 1B Algebra and Geometry |
| **STATISTICS & PROBABILITY** | | |
| **MAFS.6.SP.1.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* | **7Dc1** Decide which data would be relevant to an enquiry and collect and organise the data.<br><br>**7Dc2** Design and use a data collection sheet or questionnaire for a simple survey. | Unit 1C Handling Data and Geometry<br><br>Unit 1C Handling Data and Geometry |
| **MAFS.6.SP.1.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. | | |

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| **MAFS.6.SP.1.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. | **7Dp2** Calculate the mean, including from a simple frequency table.<br><br>**7Dp1** Find the mode (or modal class for grouped data), median and range. | Unit 2C Handling Data and Geometry<br><br>Unit 2C Handling Data and Geometry |
| **MAFS.6.SP.2.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. | **7Dc3** Construct and use frequency tables to gather discrete data, grouped where appropriate in equal class intervals.<br><br>**7Dp3** Draw and interpret:<br>- bar-line graphs and bar charts<br>- frequency diagrams for grouped discrete data<br>- simple pie charts<br>- pictograms. | Unit 3C Handling Data and Geometry<br><br>Unit 2C Handling Data and Geometry |
| **MAFS.6.SP.2.5** Summarize numerical data sets in relation to their context, such as by:<br><br>a. Reporting the number of observations.<br>b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.<br><br>c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. | **8Dp1** Calculate statistics for sets of discrete and continuous data; recognise when to use the range, mean, median and mode and, for | Stage 8 Unit 1C Handling Data and Measure |

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| | grouped data, the modal class. | |
| | **7Di2** Compare two simple distributions using the range and the mode, median or mean. | Unit 3C Handling Data and Geometry |
| d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | **7Di1** Draw conclusions based on the shape of graphs and simple statistics. | Unit 3C Handling Data and Geometry |
| **Problem solving is implied throughout the Florida Standards but is an explicit strand of Cambridge learning objectives (7Pt1-8, 7Ps1-6).** | **Stage 7 Framework not mapped:**<br>**7Nf3-4, 7Nc2-7, 7Gs3-10, 7Ml1-3, 7Mt2, 7Ma1, 7Pt1-8, 7Ps1-6** | |

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| **Key ideas and details** | **Framework – learning objectives** | **Scheme of work – units** |
| **RATIOS & PROPORTIONAL RELATIONSHIPS** | | |
| **MAFS.7.RP.1.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour*. | **8MI2** Know that distances in the USA, the UK and some other countries are measured in miles, and that one kilometre is about ⅝ of a mile.<br><br>**8Nc7** Recall relationships between units of measurement. | Unit 2C Handling Data and Measure<br><br>Unit 1A Number and Calculation |
| **MAFS.7.RP.1.2** Recognize and represent proportional relationships between quantities.<br><br>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.<br><br>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.<br>c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* | **8Nf6** Use equivalent fractions, decimals and percentages to compare different quantities.<br><br>**8Nf7** Simplify ratios, including those expressed in different units; divide a quantity into more than two parts in a given ratio.<br><br>**8Nf8** Use the unitary method to solve simple problems involving ratio and direct proportion. | Unit 2A Number and Calculation<br><br>Unit 3A Number and Calculation<br><br>Unit 3A Number and Calculation |

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| d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0,0) and (1, r) where r is the unit rate. | **9Nf6** Recognise when two quantities are directly proportional; solve problems involving proportionality, e.g. converting between different currencies. | Stage 9 Unit 3A Number and Measure |
| **MAFS.7.RP.1.3** Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.* | **8Nc8** Solve simple word problems including direct proportion problems.<br><br>**9Nf5** Compare two ratios; interpret and use ratio in a range of contexts.<br><br>**8Nf8** Use the unitary method to solve simple problems involving ratio and direct proportion.<br><br>**8Nf5** Calculate and solve problems involving percentages of quantities and percentage increases or decreases; express one given number as a fraction or percentage of another. | Unit 2A Number and Calculation<br><br>Stage 9 Unit 3A Number and Measure<br><br>Unit 3A Number and Calculation<br><br>Unit 2A Number and Calculation |
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| **MAFS.7.NS.1.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.<br><br>a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*<br>b. Understand p + q as the number located a distance \|q\| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.<br><br>c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.<br><br>d. Apply properties of operations as strategies to add and subtract rational numbers. | **9Ni1** Add, subtract, multiply and divide directed numbers.<br><br>**8Ni3** Calculate squares, positive and negative square roots, cubes and cube roots; use the notation $\sqrt{49}$ and $\sqrt[3]{64}$ and index notation for positive integer powers.<br><br>**9Ae7** Substitute positive and negative numbers into expressions and formulae.<br><br>**9Np3** Use the order of operations, including brackets and powers. | Stage 9 Unit 1A Number and Calculation<br><br>Unit 3A Number and Calculation<br><br>Stage 9 Unit 2B Algebra and Geometry<br><br>Stage 9 Unit 2A Number and Calculation |
| **MAFS.7.NS.1.2** Apply and extend previous understanding of multiplication and division and of fractions to multiply and divide rational numbers.<br><br>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.<br>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a | **8Nc9** Use the laws of arithmetic and inverse operations to simplify calculations with integers and fractions.<br><br>**8Nc10** Use the order of operations, including brackets, with more complex calculations.<br><br>**9Nc5** Recognise the effects of multiplying and dividing by numbers | Unit 3A Number and Calculation<br><br>Unit 3A Number and Calculation<br><br>Stage 9 Unit 2A Number and Calculation |

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| rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.<br>c. Apply properties of operations as strategies to multiply and divide rational numbers.<br>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. | between 0 and 1. | |
| | **8Nf1** Find equivalent fractions, decimals and percentages by converting between them. | Unit 1A Number and Calculation |
| | **9Nf1** Consolidate writing a fraction in its simplest form by cancelling common factors. | Stage 9 Unit 1A Number and Calculation |
| | **8Nf2** Convert a fraction to a decimal using division; know that a recurring decimal is a fraction. | Unit 1A Number and Calculation |
| | **8Nf3** Order fractions by writing with common denominators or dividing and converting to decimals. | Unit 1A Number and Calculation |
| | **8Nf4** Add and subtract fractions and mixed numbers; calculate fractions of quantities (fraction answers); multiply and divide an integer by a fraction. | Unit 2A Number and Calculation |
| | **9Nf2** Add, subtract, multiply and divide fractions, interpreting division as a multiplicative inverse, and cancelling common factors before multiplying or dividing. | Stage 9 Unit 1A Number and Calculation |
| | **9Nf4** Recognise when fractions or percentages are needed to compare different quantities. | Stage 9 Unit 2A Number and Calculation |

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| **MAFS.7.NS.1.3** Solve real-world and mathematical problems involving the four operations with rational numbers. | **9Mt1** Solve problems involving average speed. | Stage 9 Unit 2C Handling Data and Measure |
| | **9Mt2** Use compound measures to make comparisons in real-life contexts, e.g. travel graphs and value for money. | Stage 9 Unit 3A Number and Measure |
| | **9Ma2** Know that land area is measured in hectares (ha), and that 1 hectare = 10 000 $m^2$; convert between hectares and square metres. | Stage 9 Unit 2C Handling Data and Measure |
| | **9Nc2** Solve word problems mentally. | Stage 9 Unit 1A Number and Calculation |
| | **9Nf3** Solve problems involving percentage changes, choosing the correct numbers to take as 100% or as a whole, including simple problems involving personal or household finance, e.g. simple interest, discount, profit, loss and tax. | Stage 9 Unit 2A Number and Calculation |
| | **8Ml1** Choose suitable units of measurement to estimate, measure, calculate and solve problems in a range of contexts, including units of mass, length, area, volume or capacity. | Unit 1C Handling Data and Measure |

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| | **All Problem Solving:**<br>**8Pt 1-8 Using techniques and skills in solving mathematical problems**<br>**8Ps1-6 Using understanding and strategies in solving problems** | All units |
| **EXPRESSIONS & EQUATIONS** | | |
| **MAFS.7.EE.1.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | **8Ae1** Know that letters play different roles in equations, formulae and functions; know the meanings of *formula* and *function*. | Unit 1B Algebra and Geometry |
| | **8Ae2** Know that algebraic operations, including brackets, follow the same order as arithmetic operations; use index notation for small positive integer powers. | Unit 1B Algebra and Geometry |
| | **8Ae3** Construct linear expressions. | Unit 1B Algebra and Geometry |
| | **8Ae4** Simplify or transform linear expressions with integer coefficients; collect like terms; multiply a single term over a bracket. | Unit 1B Algebra and Geometry |
| | **8Ae6** Substitute positive and negative integers into formulae, linear expressions and expressions involving small powers, e.g. $3x^2 + 4$ | Unit 2B Algebra and Geometry |

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| | or $2x^3$, including examples that lead to an equation to solve. | |
| **MAFS.7.EE.1.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."* | **8As1** Generate terms of a linear sequence using term-to-term and position-to-term rules; find term-to-term and position-to-term rules of sequences, including spatial patterns. | Unit 1B Algebra and Geometry |
| **MAFS.7.EE.2.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.* | **8As2** Use a linear expression to describe the *n*th term of a simple arithmetic sequence, justifying its form by referring to the activity or practical context from which it was generated.<br><br>**9Mt2** Use compound measures to make comparisons in real-life contexts, e.g. travel graphs and value for money. | Unit 3B Algebra and Geometry<br><br>Stage 9 Unit 3A Number and Measure |
| **MAFS.7.EE.2.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. | **8As3** Express simple functions algebraically and represent them in mappings.<br><br>**9Ae3** Construct algebraic expressions.<br><br>**9Ae4** Simplify or transform algebraic expressions by taking out single-term common factors. | Unit 1B Algebra and Geometry<br><br>Stage 9 Unit 1B Algebra and Geometry<br><br>Stage 9 Unit 1B Algebra and Geometry |

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| | **9Ae5** Add and subtract simple algebraic fractions. | Stage 9 Unit 2B Algebra and Geometry |
| a. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* | **8Ae7** Construct and solve linear equations with integer coefficients (unknown on either or both sides, without or with brackets). | Unit 3B Algebra and Geometry |
| | **8Ae5** Derive and use simple formulae, e.g. to convert degrees Celsius (°C) to degrees Fahrenheit (°F). | Unit 2B Algebra and Geometry |
| | **9Mt1** Solve problems involving average speed. | Stage 9 Unit 2C Handling Data and Measure |
| | **9Ae6** Derive formulae and, in simple cases, change the subject; use formulae from mathematics and other subjects. | Stage 9 Unit 2B Algebra and Geometry |
| b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.* | **9Ae11** Understand and use inequality signs (<, >, ≤, ≥); construct and use linear inequalities in one variable; represent the solution set on a number line. | Stage 9 Unit 1B Algebra and Geometry |
| **GEOMETRY** | | |

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| **MAFS.7.G.1.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. | **9Gp8** Make and use scale drawings and interpret maps. | Stage 9 Unit 3C Handling Data and Geometry |
| | **9Gp9** Find by reasoning the locus of a point that moves at a given distance from a fixed point, or at a given distance from a fixed straight line. | Stage 9 Unit 3C Handling Data and Geometry |
| | **8Gp4** Interpret and make simple scale drawings. | Unit 1C Handling Data and Measure |
| | **8Gs3** Know that the longest side of a right-angled triangle is called the hypotenuse. | Unit 1B Algebra and Geometry |
| | **8Gp1** Find the midpoint of the line segment AB, given the coordinates of points A and B. | Unit 1B Algebra and Geometry |
| | **8Gp3** Understand and use the language and notation associated with enlargement; enlarge 2D shapes, given a centre of enlargement and a positive integer scale factor. | Unit 3C Handling Data and Measure |

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| **MAFS.7.G.1.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | **8Gp4** Interpret and make simple scale drawings. | Unit 1C Handling Data and Measure |
| | **8Ma3** Use simple nets of solids to work out their surface areas. | Unit 2C Handling Data and Measure |
| | **9Gs6** Use a straight edge and compasses to:<br>- construct the perpendicular from a point to a line and the perpendicular from a point on a line<br>- inscribe squares, equilateral triangles, and regular hexagons and octagons by constructing equal divisions of a circle. | Stage 9 Unit 3B Algebra and Geometry |
| | **8Gs9** Use a straight edge and compasses to construct:<br>- the midpoint and perpendicular bisector of a line segment<br>- the bisector of an angle. | Unit 2B Algebra and Geometry |
| | **8Gs10** Use a ruler and compasses to construct:<br>- circles and arcs<br>- a triangle, given three sides SSS<br>- a triangle, given a right angle, hypotenuse and one side RHS. | Unit 3C Handling Data and Measure |

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| **MAFS.7.G.1.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. | **9Ma4** Calculate lengths, surface areas and volumes in right-angled prisms and cylinders. | Stage 9 Unit 3A Number and Measure |
| | **8Gs7** Draw simple nets of solids, e.g. cuboid, regular tetrahedron, square-based pyramid, triangular prism. | Unit 2B Algebra and Geometry |
| | **9Gs4** Analyse 3D shapes through plans and elevations. | Stage 9 Unit 1B Algebra and Geometry |
| | **9Gs5** Identify reflection symmetry in 3D shapes. | Stage 9 Unit 1B Algebra and Geometry |
| | **8Gs8** Identify all the symmetries of 2D shapes. | Unit 2B Algebra and Geometry |
| **MAFS.7.G.2.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. | **8Ma1** Know the definition of a circle and the names of its parts; know and use formulae for the circumference and area of a circle. | Unit 3C Handling Data and Measure |
| | **9Ma3** Solve problems involving the circumference and area of circles, including by using the π key of a calculator. | Stage 9 Unit 3A Number and Measure |

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| **MAFS.7.G.2.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi step problem to write and solve simple equations for an unknown angle in a figure. | **8Gs1** Know that if two 2D shapes are congruent, corresponding sides and angles are equal. | Unit 1 B Algebra and Geometry |
| | **8Gs2** Classify quadrilaterals according to their properties, including diagonal properties. | Unit 1B Algebra and Geometry |
| | **9Gp7** Use bearings (angles measured clockwise from the north) to solve problems involving distance and direction. | Stage 9 Unit 3C Handling Data and Geometry |
| | **8Gs4** Identify alternate angles and corresponding angles. | Unit 1B Algebra and Geometry |
| | **8Gs5** Understand a proof that:<br>- the angle sum of a triangle is 180° and that of a quadrilateral is 360°<br>- the exterior angle of a triangle is equal to the sum of the two interior opposite angles. | Unit 3B Algebra and Geometry |
| | **8Gs6** Solve geometrical problems using properties of angles, of parallel and intersecting lines, and of triangles and special quadrilaterals, explaining reasoning with diagrams and text. | Unit 3B Algebra and Geometry |

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| **MAFS.7.G.2.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | **8Ma2** Derive and use formulae for the area of a triangle, parallelogram and trapezium; calculate areas of compound 2D shapes, and lengths, surface areas and volumes of cuboids. | Unit 2C Handling Data and Measure |
| | **9MI1** Solve problems involving measurements in a variety of contexts. | Stage 9 Unit 1C Handling Data and Measure |
| **STATISTICS & PROBABILITY** | | |
| **MAFS.7.SP.1.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | **9Dc1** Suggest a question to explore using statistical methods; identify the sets of data needed, how to collect them, sample sizes and degree of accuracy. | Stage 9 Unit 1C Handling Data and Measure |
| | **9Dc2** Identify primary or secondary sources of suitable data. | Stage 9 Unit 1C Handling Data and Measure |
| | **9Dc3** Design, trial and refine data collection sheets. | Stage 9 Unit 1C Handling Data and Measure |
| | **9Dc4** Collect and tabulate discrete and continuous data, choosing suitable equal class intervals where appropriate. | Stage 9 Unit 1C Handling Data and Measure |
| | **9Dp1** Calculate statistics and select those most appropriate to the problem. | Stage 9 Unit 1C Handling Data and Measure |

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| | **8Dc1** Identify and collect data to answer a question; select the method of collection, sample size and degree of accuracy needed for measurements. | Unit 1C Handling Data and Measure |
| | **8Dc2** Know the difference between discrete and continuous data. | Unit 1C Handling Data and Measure |
| **MAFS.7.SP.1.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.* | **8Di1** Interpret tables, graphs and diagrams for discrete and continuous data, and draw conclusions, relating statistics and findings to the original question. | Unit 1C Handling Data and Measure |
| **MAFS.7.SP.2.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* | **8Di2** Compare two distributions, using the range and one or more of the mode, median and mean. | Unit 2C Handling Data and Measure |
| | **8Di3** Compare proportions in two pie charts that represent different totals. | Unit 3C Handling Data and Measure |
| | **8Dp2** Draw, and interpret:<br>- frequency diagrams for discrete and continuous data<br>- pie charts<br>- simple line graphs for time series<br>- stem-and-leaf diagrams.<br>- scatter graphs to develop | Unit 2C Handling Data and Measure |

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| | understanding of correlation<br>- back to back stem-and-leaf diagrams.<br><br>**8Dc3** Construct and use:<br>- frequency tables with given equal class intervals to gather continuous data<br>- two-way tables to record discrete data. | Unit 1C Handling Data and Measure |
| **MAFS.7.SP.2.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.* | **8Di2** Compare two distributions, using the range and one or more of the mode, median and mean. | Unit 2C Handling Data and Measure |
| **MAFS.7.SP.3.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. | **8Db1** Know that if the probability of an event occurring is p, then the probability of it not occurring is 1 – p.<br><br>**7Db1** Use the language of probability to describe and interpret results involving likelihood and chance.<br><br>**7Db2** Understand and use the probability scale from 0 to 1.<br><br>**9Db1** Know that the sum of probabilities of all mutually exclusive outcomes is 1 and use this when solving probability problems. | Unit 1C Handling Data and Measure<br><br>Stage 7 Unit 1C Handling Data and Geometry<br><br>Stage 7 Unit 1C Handling Data and Geometry<br><br>Stage 9 Unit 3C Handling Data and Geometry |

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| **MAFS.7.SP.3.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.* | **9Db3** Understand relative frequency as an estimate of probability and use this to compare outcomes of experiments in a range of contexts.<br><br>**7Db5** Use experimental data to estimate probabilities.<br><br>**7Db6** Compare experimental and theoretical probabilities in simple contexts. | Stage 9 Unit 3C Handling Data and Geometry<br><br>Stage 7 Unit 1C Handling Data and Geometry<br><br>Stage 7 Unit 1C Handling Data and Geometry |
| **MAFS.7.SP.3.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.<br><br>a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*<br>b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance | **8Db4** Compare estimated experimental probabilities with theoretical probabilities, recognising that:<br>- when experiments are repeated different outcomes may result<br>- increasing the number of times an experiment is repeated generally leads to better estimates of probability.<br><br>**7Db3** Find probabilities based on equally likely outcomes in simple contexts.<br><br>**7Db4** Identify all the possible mutually exclusive outcomes of a single event. | Unit 3C Handling Data and Measure<br><br>Stage 7 Unit 1C Handling Data and Geometry<br><br>Stage 7 Unit 2C Handling Data and Geometry |

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| process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?* | | |
| **MAFS.7.SP.3.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.<br><br>a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.<br><br>b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify t he outcomes in the sample space which compose the event.<br>c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?* | **8Db2** Find probabilities based on equally likely outcomes in practical contexts.<br><br>**8Db3** Find and list systematically all possible mutually exclusive outcomes for single events and for two successive events.<br><br>**9Db2** Find and record all outcomes for two successive events in a sample space diagram. | Unit 1C Handling Data and Measure<br><br>Unit 2C Handling Data and Measure<br><br>Stage 9 Unit 3C Handling Data and Geometry |
| **Problem solving is implied throughout the Florida Standards but is an explicit strand of Cambridge learning objectives (8Pt1-8, 8Ps1-6).** | **Stage 8 Framework not mapped:**<br>**8Nc1-2, 8Gp2, 8Mt1, 8Pt1-8, 8Ps1-6** | |

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| Key ideas and details | Framework – learning objectives | Scheme of work – units |
| **THE NUMBER SYSTEM** | | |
| **MAFS.8.NS.1.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. | **9Ni2** Estimate square roots and cube roots.<br><br>**9Ni3** Use positive, negative and zero indices and the index laws for multiplication and division of positive integer powers.<br><br>**9Nc1** Extend mental methods of calculation, working with decimals, fractions, percentages and factors, using jottings where appropriate.<br><br>**9Ae11** Understand and use inequality signs (<, >, ≤, ≥,); construct and solve linear inequalities in one variable; represent the solution set on a number line. | Unit 2A Number and Calculation<br><br>Unit 2A Number and Calculation<br><br>Unit 1A Number and Calculation<br><br>Unit 2B Algebra and Geometry |
| **MAFS.8.NS.1.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* | **9Np2** Round numbers to a given number of decimal places or significant figures; use to give solutions to problems with an appropriate degree of accuracy.<br><br>**9Nc1** Extend mental methods of calculation, working with decimals, fractions, percentages and factors, | Unit 1A Number and Calculation<br><br>Unit 1A Number and Calculation |

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| | using jottings where appropriate. | |
| **EXPRESSIONS & EQUATIONS** | | |
| **MAFS.8.EE.1.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. | **9Ni3** Use positive, negative and zero indices and the index laws for multiplication and division of positive integer powers. | Unit 2A Number and Calculation |
| | **9Ni2** Estimate square roots and cube roots. | Unit 2A Number and Calculation |
| | **9Ae2** Use index notation for positive integer powers; apply the index laws for multiplication and division to simple algebraic expressions. | Unit 1B Algebra and Geometry |
| | **9Np1** Recognise the equivalence of 0.1, $^1/_{10}$ and $10^{-1}$; multiply and divide whole numbers and decimals by 10 to the power of any positive or negative integer. | Unit 1A Number and Calculation |
| **MAFS.8.EE.1.2** Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. | **9As6** Use systematic trial and improvement methods to find approximate solutions of equations such as $x^2 + 2x = 20$ (1, 2 and 7). | Unit 3A Number and Measure |

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| **MAFS.8.EE.1.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* $3 \times 10^8$ *and the population of the world as* $7 \times 10^9$*, and determine that the world population is more than 20 times larger.* | **9Np1** Recognise the equivalence of 0.1, $^1/_{10}$ and $10^{-1}$; *multiply and divide whole numbers and decimals by 10 to the power of any positive or negative integer*. | Unit 1A Number and Calculation |
| **MAFS.8.EE.1.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimetres per year for seafloor spreading). Interpret scientific notation that has been generated by technology. | **9Np1** Recognise the equivalence of 0.1, $^1/_{10}$ and $10^{-1}$; *multiply and divide whole numbers and decimals by 10 to the power of any positive or negative integer*. | Unit 1A Number and Calculation |
| **MAFS.8.EE.2.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* | **9Nf6** Recognise when two quantities are directly proportional; solve problems involving proportionality, e.g. converting between different currencies.<br><br>**9As8** Use algebraic methods to solve problems involving direct proportion, relating solutions to graphs of the equations. | Unit 3A Number and Measure<br><br>Unit 3B Algebra and Geometry |
| **MAFS.8.EE.2.6** Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx +b for a line intercepting the vertical axis at b. | **9As4** Construct tables of values and plot the graphs of linear functions, where *y* is given implicitly in terms of *x*, *rearranging the equation into the form y = mx + c; know the significance of m and find the gradient of a straight line graph*. | Unit 2B Algebra and Geometry |

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| **MAFS.8.EE.3.7** Solve linear equations in one variable.<br><br>a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).<br><br>b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. | **9Ae8** Construct and solve linear equations with integer coefficients (with and without brackets, negative signs anywhere in the equation, positive or negative solution); solve a number problem by constructing and solving a linear equation. | Unit 3B Algebra and Geometry |
| **MAFS.8.EE.3.8** Analyze and solve pairs of simultaneous linear equations.<br><br>a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.<br>b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*<br>c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.* | **9Ae9** Solve a simple pair of simultaneous linear equations by eliminating one variable. | Unit 1B Algebra and Geometry |
| **FUNCTIONS** | | |

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| **MAFS.8.F.1.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. | **9As7** Construct functions arising from real-life problems; draw and interpret their graphs. | Unit 3B Algebra and Geometry |
| | **9Ae10** Expand the product of two linear expressions of the form x ± n and simplify the corresponding quadratic expression. | Unit 3B Algebra and Geometry |
| | **9As3** Find the inverse of a linear function. | Unit 2B Algebra and Geometry |
| **MAFS.8.F.1.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.* | **9As4** Construct tables of values and plot the graphs of linear functions, where *y* is given implicitly in terms of *x*, rearranging the equation into the form $y = mx + c$; know the significance of *m* and find the gradient of a straight line graph. | Unit 2B Algebra and Geometry |
| **MAFS.8.F.1.3** Interpret the equation y =mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.* | **9As4** Construct tables of values and plot the graphs of linear functions, where *y* is given implicitly in terms of *x*, rearranging the equation into the form $y = mx + c$; know the significance of *m* and find the gradient of a straight line graph. | Unit 2B Algebra and Geometry |
| **MAFS.8.F.2.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and | **9As1** Generate terms of a sequence using term-to-term and position to term rules. | Unit 1B Algebra and Geometry |

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| initial value of a linear function in terms of the situations it models, and in terms of its graph or a table of values. | **9As2** Derive an expression to describe the nth term of an arithmetic sequence. | Unit 1B Algebra and Geometry |
| **MAFS.8.F.2.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g. where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. | **9As5** Find the approximate solutions of a simple pair of simultaneous linear equations by finding the point of intersection of their graphs. | Unit 2B Algebra and Geometry |
| **GEOMETRY** | | |
| **MAFS.8.G.1.1** Verify experimentally the properties of rotations, reflections, and translations:<br><br>a. Lines are taken to lines, and line segments to line segments of the same length.<br>b. Angles are taken to angles of the same measure.<br>c. Parallel lines are taken to parallel lines. | **9Gs5** Identify reflection symmetry in 3D shapes.<br><br>**9Gp1** Tessellate triangles and quadrilaterals and relate to angle sums and half-turn rotations; know which regular polygons tessellate, and explain why others will not.<br><br>**9Gp2** Use the coordinate grid to solve problems involving translations, rotations, reflections and enlargements.<br><br>**9Gp3** Transform 2D shapes by combinations of rotations, reflections and translations; describe the transformation that maps an object onto its image. | Unit 1B Algebra and Geometry<br><br>Unit 1B Algebra and Geometry<br><br>Unit 1B Algebra and Geometry<br><br>Unit 2B Algebra and Geometry |

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| **MAFS.8.G.1.2** Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figure describe a sequence that exhibits the congruence between them. | **9Gp5** Recognise that translations, rotations and reflections preserve length and angle, and map objects on to congruent images, and that enlargements preserve angle but not length. | Unit 2C Handling Data and Measure |
| **MAFS.8.G.1.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. | **9Gp6** Know what is needed to give a precise description of a reflection, rotation, translation or enlargement. | Unit 2C Handling Data and Measure |
| **MAFS.8.G.1.4** Understand that a two dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotation, reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them. | **9Gp4** Enlarge 2D shapes, given a centre and positive integer scale factor; identify the scale factor of an enlargement as the ratio of the lengths of any two corresponding line segments. | Unit 2C Handling Data and Measure |
| **MAFS.8.G.1.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.* | **9Gs1** Calculate the interior or exterior angle of any regular polygon; prove and use the formula for the sum of the interior angles of any polygon; prove that the sum of the exterior angles of any polygon is 360°.<br><br>**9Gs2** Solve problems using properties of angles, of parallel and intersecting lines, and of triangles, other polygons and circles, justifying inferences and explaining reasoning with diagrams and text. | Unit 2B Algebra and Geometry<br><br>Unit 2B Algebra and Geometry |

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| **MAFS.8.G.2.6** Explain a proof of the Pythagorean Theorem and its converse. | **9Gs7** Know and use Pythagoras' theorem to solve two-dimensional problems involving right-angled triangles. | Unit 3B Algebra and Geometry |
| **MAFS.8.G.2.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. | **9Gs7** Know and use Pythagoras' theorem to solve two-dimensional problems involving right-angled triangles. | Unit 3B Algebra and Geometry |
| **MAFS.8.G.2.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. | **9Gs7** Know and use Pythagoras' theorem to solve two-dimensional problems involving right-angled triangles. | Unit 3B Algebra and Geometry |
| **MAFS.8.G.3.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. | | |
| **STATISTICS & PROBABILITY** | | |
| **MAFS.8.SP.1.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | **9Dp1** Calculate statistics and select those most appropriate to the problem.<br><br>**9Di1** Interpret tables, graphs and diagrams and make inferences to support or cast doubt on initial conjectures; have a basic understanding of correlation. | Unit 1C Handling Data and Measure<br><br>Unit 2C Handling Data and Measure |

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| **MAFS.8.SP.1.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. | **9Dp2** Select, draw, and interpret diagrams and graphs, including:<br>- frequency diagrams for discrete and continuous data<br>- line graphs for time series<br>- scatter graphs to develop understanding of correlation<br>- back to back stem-and-leaf diagrams. | Unit 2C Handling Data and Measure |
| **MAFS.8.SP.1.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.* | **9Di3** Relate results and conclusions to the original question. | Unit 2C Handling Data and Measure |
| **MAFS.8.SP.1.4** Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?* | **9Di2** Compare two or more distributions; make inferences, using the shape of the distributions and appropriate statistics. | Unit 2C Handling Data and Measure |
| **Problem solving is implied throughout the Florida Standards but is an explicit strand of Cambridge learning objectives (9Pt1-7, 9Ps1-7).** | **<u>Stage 9 Framework not mapped:</u> 9Nc3-4, 9Ae1, 9Ma1, 9Pt1-7, 9Ps1-7** | |