

| Time frame | Unit title | Key and Related Concepts | Global context and exploration | Statement of inquiry | Objective/ Objective strands | ATL skills | Content |
|------------|---|---|---|---|--|---|--|
| 20 Hours | Welcome (Introductory unit- can be embedded into first unit). | Logic Justification Models | Identities and relationships: Competition, cooperation and collaboration | Logic and justification serve as models through competition, cooperation and collaboration. | A (i), B (i,ii), C (i,ii,iii), D (i,ii,iii) | Thinking: Creative Thinking Skills Practice visible thinking strategies and techniques | Knowing and understanding criteria for success- Develop understanding of the mathematics program and its objectives. Start knowing and understanding the mathematical practices. Develop and apply communication skills such as accountable talk. Baseline test- Solve problems using previous knowledge. Apply previous knowledge to new situations. Problem solving techniques- Collaborative investigation on problem solving process and techniques particular to the year. Create resources to use as reference materials through the year. |
| 20 Hours | Read between the numbers. Unit 1 | Perspective Simplification Representation | Scientific and technical innovation: The precision of systems | Representation and simplification equal perspective quantities through the precision of systems. | A (i,ii,iii), B (i,ii,iii), C (i,ii,iii,iv), D (i,ii,IV,V) | Communication: Communication Skills Use a variety of media to communicate with a range of audiences. Make inferences and draw conclusions. Research: Information Literacy Skills Collect and analyze data to identify solutions and make informed decisions. Process data and report results | Decimals and fractions solves and interprets division of fractions by fractions fluently divides multi-digit numbers using the standard algorithm (with up to five-digit dividends and two-digit divisors or four-digit dividends and two- or three-digit divisors), using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division finds 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); uses the distributive property to express a sum of two whole numbers (1 to 100) with a common factor, as a multiple of a sum of two whole numbers with no common factor, for example, expresses $36 + 8$ as $4(9 + 2)$ Extension- creates and solves word problems involving division of fractions by fractions justifies each step in the procedure assesses the reasonableness of the result |
| 20 Hours | Ratios and Relationships. Unit 2 | Relationships, Measurement, Equivalence | Globalization and sustainability (Availability of resources and societies throughout history) | Equivalences between measurement systems facilitate relationships influenced by the availability of resources and societies throughout history. | A (i,ii,iii), B (i,i,iii), C (i,ii,iii), D (i,ii,iii, IV,V) | Communication: Communication Skills Negotiate ideas and knowledge with peers and teachers. Self-management: Media Literacy Select and use technology effectively and productively Thinking: Critical Thinking Skills Use brainstorming and visual diagrams to generate new ideas and inquiries | Ratios and rates uses the concept of a ratio, ratio language, and notation to describe a ratio relationship between two quantities uses the concept of a unit rate associated with a ratio and uses rate language in context completes a table to compare ratios from mathematical problems solves a unit rate problem including those involving unit pricing or constant speed determines the percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); finds the whole given a part and the percent) uses ratio reasoning to convert measurement units; manipulates and transforms units appropriately when multiplying or dividing quantities in mathematical problems Extension- connects ratio relationships between multiple representations of ratio situations creates and uses a table to compare ratios in a real-world context applies ratio reasoning to real-world word problems and converts measurement units |

| | | | | | | | |
|----------|-----------------------------------|---|--|--|--|--|---|
| 20 Hours | The data all around us. Unit 3 | Logic, Patterns, Generalization | Fairness and development (Economic markets, demand and supply) | Logic is the mathematical generalization of patterns using data to make decisions that affect the economic markets, demand and supply. | A (i,ii,iii), B (i,ii,iii), C (i,ii,iii), D (i,ii,iii,IV,V) | Self-management: Affective Skills Demonstrate persistence and perseverance Research: Information Literacy Skills Collect and analyze data to identify solutions and make informed decisions Thinking: Critical Thinking Skills Practice observing carefully in order to recognize problems | Data Analysis and Expressions Analysis of data-justifies a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers determines a set of data collected to answer a statistical question has a distribution which can be described by using measures of center, spread, and overall shape recognizes 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 displays numerical data in plots on a number line, including dot/line plots, histograms, and box plots summarizes numerical data sets in relation to their context; identifies the range and measures of center and any striking deviations (e.g., outliers) Extension- writes a statistical question given a context analyzes how additional data points affect the measure of center in a numerical data set constructs a histogram or box plot from data displayed on a dot/line plot Expressions- writes and evaluates multi-term numerical expressions involving whole-number exponents writes expressions from written statements that record an operation (with numbers and with letters standing for numbers); recognizes one or more parts of an expression as single entities performs arithmetic operations, including those involving whole-number exponents and expressions at specific values of their variables, in the conventional order when there are no parentheses to specify a particular order (order of operations) performs arithmetic operations, including those involving whole-number exponents and expressions at specific values of their variables, in the conventional order when there are no parentheses to specify a particular order (order of operations) identifies when two expressions are equivalent uses variables to represent numbers and write expressions when solving a real-world or mathematical problem; understands that a variable can represent an unknown number or, depending on the purpose at hand, any number in a specified set Extension- writes and evaluates expressions that record operations (with numbers and with letters standing for numbers) involving real-world and mathematical contexts uses a real-world context to construct multiple equivalent expressions creates a real-world situation that corresponds to a given expression |
| 20 Hours | Modeling Equality. Unit 4 | Relationships, Equivalence, Systems, Models | Scientific and technical innovation (Digital life and the virtual environment) | Equivalence between systems and models affects relationships explored in the digital life and virtual environment | A (i,ii,iii), B (i,ii,iii), C (i,ii), D(i,ii,ii,IV,V) | Self-management: Organization skills Select and use technology effectively and productively Self-management: Affective skills Practice focus and concentration | Equations and Inequalities solves an equation or inequality, using substitution to determine whether a given number in a specified set makes an equation or inequality true solves real-world and mathematical problems by writing and solving equations in the form $x + p = q$ and $px = q$, for cases in which p , q , and x are all nonnegative, rational numbers writes an inequality in the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem; represents solutions of such inequalities on number line diagrams given graphs and tables of real-world situations, writes an equation to express the relationship between the dependent and independent variables Extension-interprets and analyzes the solution to one-step real-world and mathematical problems given an inequality in the form $x > c$ or $x < c$, creates a real-world situation and graph analyzes and describes the relationship between the variables |

| | | | | | | | |
|----------|--------------------------------|-------------------------------|---|--|--|--|--|
| 20 Hours | Be balanced. Unit 5 | Logic, Models, Representation | Fairness and development (Inequality, difference and inclusion in the use and access to resources) | Representation through models uses logic to display the inequality, difference and inclusion in the use and access to resources. | A (i,ii,iii), B (i,ii,iii), C (i,ii,iii), D (i,ii,iii,IV,V) | Self-management: Reflection Skills Try new ATL skills and evaluate their effectiveness. Identify strengths and weaknesses of personal learning strategies (self-assessment). | Integers, Rational Numbers and Operations with integers demonstrates that positive and negative numbers are used together to describe quantities having opposite directions or values; uses positive and negative numbers to represent quantities in real-world contexts; explains the meaning of 0 in each situation identifies when two points are reflections on a number line or reflections across one axis on the coordinate plane; plots ordered pairs, including rational numbers, on a coordinate plane, and on both horizontal and vertical number lines; includes coordinates of absolute value to find distances between points with the same first or second coordinate in mathematical problems determines the greater or lesser rational number, including absolute values in a real-world context; uses mathematical notation and words to express these statements of order writes, interprets, and explains statements of order for rational numbers in real-world contexts; interprets absolute value as magnitude for a positive or negative quantity in a real-world situation; distinguishes comparisons of absolute value from statements about order applies properties of operations as strategies to add and subtract rational numbers; explains subtraction as adding the additive inverse; shows $p + q$ as the number located a distance $ q $ from p in a positive or negative direction applies properties of operations as strategies to multiply or divide rational numbers; explains that division by zero is undefined; shows that $-(q/p) = (-p)/q = p/(-q)$; converts a rational number to a decimal using long division and knows that the rational number terminates in 0 or eventually repeats Extension- draws conclusions about a real-world situation involving absolute values of rational numbers and compares values justifies the steps taken to add or subtract rational numbers; analyzes for errors as necessary |
| 20 Hours | The Art of Geometry. Unit 6 | Form, Pattern, Space | Personal and cultural expression: Variety in geometric form allows for personal and cultural expression in artistry and creation | Patterns and forms create measurable space used for variety in geometric form, which allows personal and cultural expression in artistry and creation. | A (i,ii), B (iii), D (ii) | Self-management: Affective Skills Practice managing self-talk Thinking: Critical Thinking Skills Analyze complex concepts and projects into their constituent parts and synthesize them to create new understanding | Geometry finds the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes solves volume problems by relating the number of unit cubes in a prism to the multiplication of the edge lengths in the context of solving real-world and mathematical problems uses coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate uses nets to find the surface area of three-dimensional figures Extension- solves geometric multistep real-world and mathematical area problems including decimal and fractional measurements given the volume of a right rectangular prism with fractional edge lengths, finds the missing fractional edge length in the context of solving real-world and mathematical problems finds the missing vertex of a regular polygon when given the other vertices in the coordinate plane in a real-world context solves real-world and mathematical problems using nets and three-dimensional figures, including fractional |
| 20 Hours | Be ready. Unit 7 | Logic, Systems, Change | Orientation in Space and Time: Scale, duration, frequency and variability | Logic in societies drive the change in systems using scale, duration, frequency and variability. | A (i,ii,iii), B (i,ii,iii), C (i,ii), D (i,ii,iii,V) | Research: Information Literacy Skills Use memory techniques to develop long-term memory Thinking: Creative Thinking Skills Troubleshoot systems and applications. | Algebra readiness constructs an equivalent expression using either greatest common factor or least common multiple and the distributive property applies multiple properties of operations to identify and generate equivalent expressions applies the properties of operations to identify and generate multiple equivalent expressions solves an equation or inequality as a process of answering a question and justifies the answer: which values from a specified set, if any, make the equation or inequality true justifies that a variable can represent an unknown number or, depending on the purpose at hand, any number in a specified set solves and justifies one-step real-world and mathematical problems |