**Curriculum Development Course at a Glance**
**Planning for 5th Grade Mathematics**

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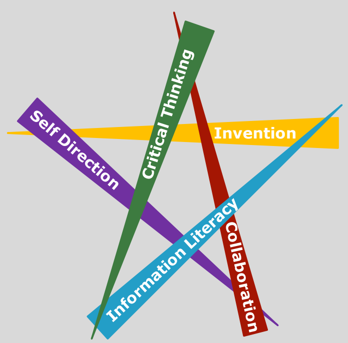
| **Content Area** | Mathematics | **Grade Level** | 5th Grade |
| **Course Name/Course Code** | | | |

| Standard | Grade Level Expectations (GLE) | GLE Code |
|---|---|---|
| 1. Number Sense, Properties, and Operations | 1. The decimal number system describes place value patterns and relationships that are repeated in large and small numbers and forms the foundation for efficient algorithms | MA10-GR.5-S.1-GLE.1 |
| | 2. Formulate, represent, and use algorithms with multi-digit whole numbers and decimals with flexibility, accuracy, and efficiency | MA10-GR.5-S.1-GLE.2 |
| | 3. Formulate, represent, and use algorithms to add and subtract fractions with flexibility, accuracy, and efficiency | MA10-GR.5-S.1-GLE.3 |
| | 4. The concepts of multiplication and division can be applied to multiply and divide fractions | MA10-GR.5-S.1-GLE.4 |
| 2. Patterns, Functions, and Algebraic Structures | 1. Number patterns are based on operations and relationships | MA10-GR.5-S.2-GLE.1 |
| 3. Data Analysis, Statistics, and Probability | 1. Visual displays are used to interpret data | MA10-GR.5-S.3-GLE.1 |
| 4. Shape, Dimension, and Geometric Relationships | 1. Properties of multiplication and addition provide the foundation for volume an attribute of solids | MA10-GR.5-S.4-GLE.1 |
| | 2. Geometric figures can be described by their attributes and specific locations in the plane | MA10-GR.5-S.4-GLE.2 |

## Colorado 21st Century Skills




**Critical Thinking and Reasoning:** *Thinking Deeply, Thinking Differently*

**Information Literacy:** *Untangling the Web*

**Collaboration:** *Working Together, Learning Together*

**Self-Direction:** *Own Your Learning*

**Invention:** *Creating Solutions*

## Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

| Unit Titles | Length of Unit/Contact Hours | Unit Number/Sequence |
|---|---|---|
| Pump Up the Volume | 4 weeks | 1 |
| Fraction Reaction | 10 weeks | 2 |
| "X" Marks the Spot | 5-6 weeks | 3 |
| Doctor We Still Need to Operate. . . | 12 weeks | 4 |

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| **Unit Title** | Pump Up the Volume | **Length of Unit** | 4 weeks |
| **Focusing Lens(es)** | Measurement<br>Comparison | **Standards and Grade Level Expectations Addressed in this Unit** | MA10-GR.5-S.4-GLE.1, MA10-GR.5-S.4-GLE.2 |
| **Inquiry Questions (Engaging-Debatable):** | • Why would we use a cube to measure volume? (MA10-GR.5-S.4-GLE-1-IQ.1)<br>• What shapes fit best to fill a three dimensional space with as few gaps and overlaps as possible? | | |
| **Unit Strands** | Measurement and Data<br>Geometry | | |
| **Concepts** | Unit cube, volume, gaps, overlaps, decomposition, composition, layers, arrays, cube, three-dimensional shapes, right rectangular prism, edge, lengths, multiplication, addition, layers (slices), equivalent, height, base, area, additive, attributes, categories, subcategories | | |

| **Generalizations**<br>**My students will Understand that…** | **Guiding Questions**<br>**Factual** | **Conceptual** |
|---|---|---|
| A 1-unit by 1-unit by 1-unit cube provides a means to measure the volume of rectangular prism (MA10-GR.5-S.4-GLE-1-EO.a.i, b.i) | What is the volume of a 1-unit by 1-unit by 1-unit right rectangular prism? | Why is important to have no gaps and overlaps when filling a space to determine volume? |
| The volume of some three-dimensional shapes can decompose into non-overlapping right rectangular prisms represented as layered arrays of cubes (MA10-GR.5-S.4-GLE-1-EO.a.i) | What is an array?<br>Why is it possible to layer arrays to create volume? | How does area differ from volume when using arrays? |
| Non-overlapping right rectangular prisms added together to determine the volume of a solid figure exemplifies the additive nature of volume (MA10-GR.5-S.4-GLE-1-EO.b.iii) | How can you find the volume of solid figures composed of right rectangular prisms? | How do we know that the calculation of volume ban be additive and multiplicative?<br>Why is it helpful that volume is additive? |
| The volume of a right rectangular prism represents the product of the edge lengths (length, width, height) multiplied in any order or the product of the area of the base and multiplied by the height (MA10-GR.5-S.4-GLE-1-EO.a.ii, a.iii, b.ii) | How can you calculate the volume of a right rectangular prism if you know the lengths of the sides?<br>How does the volume of 12 cubic units differ from 12 units cubed? | Why can any face of a right rectangular prism be considered the base?<br>How can the visual model of finding the volume of right rectangular prism represent the associative property of multiplication? |

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| Attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category (MA10-GR.5-S.4-GLE-2-EO.c.i) | If an attribute helps defines a category of quadrilaterals why do all subcategories of quadrilaterals also share the attribute?<br>What are the ways to compare and classify geometric figures? (MA10-GR.5-S.4-GLE-2-IQ.1) | Why is the statement, "All squares are rectangles but not all rectangles are squares" true?<br>Why do we classify shapes? (MA10-GR.5-S.4-GLE-2-IQ.3) |

| **Key Knowledge and Skills:**<br>**My students will…** | *What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.* |
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- Classify two-dimensional figures based on a hierarchy of properties (MA10-GR.5-S.4-GLE-2-EO.c.ii)
- Recognize volume as an attribute of solid figures and understand a cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume (MA10-GR.5-S.4-GLE-1-EO.a.i)
- Understand a solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units (MA10-GR.5-S.4-GLE-1-EO.a.i)
- Measure volumes by counting unit cubes, using cubic centimeters, cubic inches, cubic feet, and improvised units (MA10-GR.5-S.4-GLE-1-EO.b.i)
- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show the volume is the same as would be found by multiplying the edge lengths or equivalently by multiplying the height by the area of the base (MA10-GR.5-S.4-GLE-1-EO.a.ii)
- Represent threefold whole-number products as volumes to represent the associative property of multiplication (MA10-GR.5-S.4-GLE-1-EO.a.iii)
- Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems (MA10-GR.5-S.4-GLE-1-EO.b.i)
- Recognize volume as additive (MA10-GR.5-S.4-GLE-1-EO.b.iii)
- Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts and apply the technique to solve real world problems (MA10-GR.5-S.4-GLE-1-EO.b.iii)

**Critical Language:** includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.
EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

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| **A student in ______________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):** | *A square is a rectangle but a rectangle is not always a square because not all rectangles have four equal side lengths. The volume of a right rectangular prism can be found by filling it with unit cubes with no gaps or overlaps which helps to justify the formula for the volume of a prism by representing the layers of arrays of cubes.* |
| **Academic Vocabulary:** | Gaps, overlaps, layers, cube, three-dimensional shapes, lengths, multiplication, addition, height, categories, subcategories |
| **Technical Vocabulary:** | Right rectangular prism, volume, face, edge, cubic units, unit cube, decompose, compose, arrays, right rectangular prism, edge, equivalent, base, area, additive, attributes, |

| **Unit Title** | Fraction Reaction | | | **Length of Unit** | 10 weeks |
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| **Focusing Lens(es)** | Interpretation<br>Relationships | **Standards and Grade Level Expectations Addressed in this Unit** | MA10-GR.5-S.1-GLE.3, MA10-GR.5-S.1-GLE.4 | | |
| **Inquiry Questions (Engaging-Debatable):** | • How do operations with fractions compare to operations with whole numbers? (MA10-GR.5-S.1-GLE.3-IQ.1)<br>• Why are there more fractions than whole numbers? (MA10-GR.5-S.1-GLE.3-IQ.2) | | | | |
| **Unit Strands** | Number and Operations – Fractions | | | | |
| **Concepts** | Denominator, numerator, fraction, addition, subtraction, common denominators, multiplication, division, whole number, unit fraction, expressions, area model, 1X1 unit square, partitioning, representation, rectangular regions, product, quotient, scaling (resizing), comparison, factor, estimation, real world problems, contexts, equal groups, fair sharing, rates, measurement (quotative), arrays, area, | | | | |

| **Generalizations**<br>**My students will Understand that…** | **Guiding Questions**<br>**Factual** | **Conceptual** |
|---|---|---|
| The addition and subtraction of fractions necessitates common denominators in order to join or separate same size parts in the numerators of the fractions (MA10-GR.5-S.1-GLE.3-EO.a.i, a.ii) | What does the denominator of a fraction describe?<br>How do you add or subtract fractions with different denominators?<br>How can visual models be used represent and solve addition and subtraction of fraction problems involving unlike denominators?<br>How can equations be used represent and solve addition and subtraction of fraction problems involving unlike denominators? | Why does 2/3 + 3/4 not equal 3/6?<br>When adding fractions with a common denominator why does the denominator stay the same?<br>Why do you need equivalent fractions when adding or subtracting?<br>Why is it important to use benchmark fractions and number sense to estimate mentally the sums and differences of fractions? |
| The rewriting of an equation that multiplies a fraction by a whole number as a combination of whole number multiplication and division creates an equivalent equation (MA10-GR.5-S.1-GLE.4-EO.c) | How can you rewrite (3/4) x 5 as an expression involving multiplication and division of whole numbers? | Why is helpful to interpret multiplication of fractions by whole numbers as multiplication and division of whole numbers? |
| The calculation of the area of a rectangle with fractional lengths, as an extension of *l* x *w* = *A* for whole numbers, requires the usage of appropriate units of measure and the understanding of common factors/divisors (MA10-GR.5-S.1-GLE.4-EO.d, d.i) | How is the product of two fractions equivalent to the product of the numerators and denominators, based on an area model of fraction multiplication?<br>How do you use common factors or common divisors in calculating fractional area? | Why is it not necessary to find a common denominator prior to multiplying two fractions? |

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| Multiplication as scaling (resizing) rather than repeated addition allows mathematicians to compare the size of a product to the size of one factor on the basis of the other factor (MA10-GR.5-S.1-GLE.4-EO.e.i, e.ii) | What is different about stretching something that is 2 units long to be 3 times its original length (3x2) versus stretching something that is 1/3 a unit long to be 1/2 of its original length (1/2 x 1/3) ?<br>What is the effect of a multiplying a given number by a fraction less than 1?<br>What happens to the product if one of the factors is equivalent to a quantity of one?<br>If we continued multiplying by smaller and smaller fractions, such as 1/5 × ½, 1/6 × ½, etc., what happens to the size of the products? | How can you predict the relative size of a product based on its factors?<br>Why is it helpful to predict the relative size of a product?<br>Why doesn't multiplication always make quantities larger? (MA10-GR.5-S.1-GLE.4-IQ.1) |
| Real world problems for multiplication and division of fractions often involve contexts such as of equal groups, fair sharing, rates, measurement, scaling, and arrays/area (MA10-GR.5-S.1-GLE.4-EO.f, i) | What is an example of multiplication of fraction problem involving equal groups? Fair sharing? Scaling? Area? Quotative division? | How are contexts involving whole number multiplication similar and different than those involving fractions? |
| The ability to multiply two fractions and to change their multiplication into expressions of whole number multiplication and division creates the foundation for solving division of whole numbers by a unit fraction and vice versa (MA10-GR.5-S.1-GLE.4-EO.g, h) | How can you change a unit fraction divided by a whole number problem to a missing factor multiplication problem to help you find the quotient?<br>How can you change a whole number divided by a fraction problem to a missing factor multiplication problem and then change the multiplication problem into a string of whole number multiplication and division to help you find the quotient? | How does interpreting contextualized problems provide a foundation for understanding fraction division? |
| Fraction a/b (in which a is divided by b) can represent a fair share problem where a objects are shared by b people (MA10-GR.5-S.1-GLE.4-EO.a, b) | How can you share 5 cakes among 4 people?<br>How can you share 5 cakes among 3 people? | How can you interpret a fraction as a fair share division problem when the fraction is greater than one? Less than one?<br>Why doesn't division always make quantities smaller? (MA10-GR.5-S.1-GLE.4-IQ.2) |

| **Key Knowledge and Skills:** My students will… | *What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.* |
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- Add and subtract with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators (MA10-GR.5-S.1-GLE.3-EO.a.ii)
- Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers (MA10-GR.5-S.1-GLE.3-EO.a.i)
- Interpret a fraction as division of the numerator by the denominator (MA10-GR.5-S.1-GLE.4-EO.a)
- Interpret the product $(a/b) \times q$ as a parts of a partition of $q$ into $b$ equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$ (MA10-GR.5-S.1-GLE.4-EO.c)
- Find the area of a rectangle with fraction side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths (MA10-GR.5-S.1-GLE.4-EO.d)
- Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas (MA10-GR.5-S.1-GLE.4-EO.d.i)
- Interpret multiplication as scaling (resizing) (MA10-GR.5-S.1-GLE.4-EO.e)
- Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication (MA10-GR.5-S.1-GLE.4-EO.e.i)
- Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relate the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying $a/b$ by 1 (MA10-GR.5-S.1-GLE.4-EO.e.ii)
- Interpret division of a unit fraction by a non-zero whole number and a whole by number by a unit fraction (MA10-GR.5-S.1-GLE.4-EO.g, f)
- Compute quotients of a unit fraction by a non-zero whole number and whole number by a unit fraction (MA10-GR.5-S.1-GLE.4-EO.g, f)
- Solve word problems using visual models or equations to represent the problem which involve: addition and subtraction of fractions referring to the same whole, including cases of unlike denominators; division of whole numbers leading to answer in the form of fractions or mixed numbers; multiplication of fractions and mixed numbers; and, division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions (MA10-GR.5-S.1-GLE.3-EO.a.iii) and (MA10-GR.5-S.1-GLE.4-EO.b, f, i)

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EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

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|---|---|
| **A student in ______________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):** | *If I know the area of a piece of cloth is 6 square yards and one side is 1/5 of a yard I can find the other side by imagining the cloth cut into strips one-fifth wide and one yard long, this would give me five strips for every one square yard or a total of 30 strips which means the cloth is 30 feet long.* |
| **Academic Vocabulary:** | Addition, subtraction, multiplication, division, comparison, estimation, real world problems, equal groups, fair sharing, |
| **Technical Vocabulary:** | Numerator, denominator, benchmark fractions, improper fraction, mixed number, equivalent fraction, simplest form, whole number, unit fraction, expressions, product, quotient, scaling, resizing, factor, rates, measurement, arrays, area |

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| **Unit Title** | "X" Marks the Spot | **Length of Unit** | 5-6 weeks |
| **Focusing Lens(es)** | Patterns<br>Change | **Standards and Grade Level Expectations Addressed in this Unit** | MA10-GR.5-S.1-GLE.1<br>MA10-GR.5-S.2-GLE.1<br>MA10-GR.5-S.3-GLE.1<br>MA10-GR.5-S.4-GLE.2 |
| **Inquiry Questions (Engaging-Debatable):** | • What is the connection between patterns and coordinate points? | | |
| **Unit Strands** | Operations and Algebraic Thinking, Geometry, Measurement and Data, Personal Financial Literacy | | |
| **Concepts** | Patterns, rules, relationships, corresponding terms, graphs, coordinate plane (system), axes, origin, intersection, perpendicular, point, ordered pair, coordinates | | |

| **Generalizations**<br>**My students will Understand that…** | **Guiding Questions**<br>**Factual** | **Conceptual** |
|---|---|---|
| The understanding of equivalent pairs of measurements allows mathematicians to establish measurement equivalents within the same measurement system (i.e., 1 foot is as long as 12 inches, so 2 feet is as long as 3x12=36 inches) (MA10-GR.5-S.1-GLE.1-EO.d.i) | How many centimeters in a meter?<br>How many inches in a foot?<br>How can you convert from one measurement to another, such as from feet to inches? | How is the metric system similar to our base ten place value system? |
| The generation of numerical patterns using given rules and graphing the corresponding terms on a coordinate plane provides the foundation for the development of ratio and function (MA10-GR.5-S.2-GLE.1-EO.a, b, c, d) | How can you generate ordered pairs from a rule? | How do you know when there is a pattern? (MA10-GR.5-S.2-GLE.1-IQ.1)<br>How are patterns useful? (MA10-GR.5-S.2-GLE.1-IQ.2) |
| A pair of perpendicular number lines, called axes, defines a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line (MA10-GR.5-S.4-GLE.2-EO.a, b) | What are the perpendicular number lines on a coordinate grid called?<br>What is the origin? | How does using a coordinate grid help us solve real world problems? (MA10-GR.5-S.4-GLE.2-IQ.1) |
| A coordinate plane provides the location for visually representing the relationship of ordered pairs (a, b) where the first number indicates how far to travel from the origin in the direction of one (x) axis, and the second number indicates how far to travel in the direction of the second (y) axis (MA10-GR.5-S.4-GLE.2-EO.a, b) | What do x and y mean on a coordinate grid?<br>(F)) What are the x and y axes?<br>How do you locate a point from its coordinates?<br>How do find the coordinates for a point? | Why are two numbers necessary for locating points on a coordinate plane? |

| **Key Knowledge and Skills:** My students will… | *What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.* |
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- Generate two numerical patterns using two given rules and identify apparent relationships between corresponding terms (MA10-GR.5-S.2-GLE.1-EO.a, b)
- Form ordered pairs consisting of corresponding terms of two patterns, and graph the ordered pairs on a coordinate plane (MA10-GR.5-S.2-GLE.1-EO.c)
- Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates (MA10-GR.5-S.4-GLE.2-EO.b)
- Recognize in a an ordered pair the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate) (MA10-GR.5-S.4-GLE.2-EO.a, b)
- Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation (MA10-GR.5-S.4-GLE.2-EO.b)
- Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8) and use operations on fractions for this grade to solve problems involving information presented in line plots (MA10-GR.5-S.3-GLE.1-EO.a.i, a.ii)
- Use patterns to solve problems including those involving saving and checking accounts, such as patterns created when saving $10 a month (MA10-GR.5-S.2-GLE.1-EO.e)*
- Explain, extend, and use patterns and relationships in solving problems, including those involving saving and checking accounts such as understanding that spending more means saving less (MA10-GR.5-S.2-GLE.1-EO.f)*

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EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

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| **A student in ______________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):** | *If I save $10 a month every month for a year starting in January I can graph on a coordinate plane the corresponding terms of the two patterns, the number for each month and totaled saved.* |
| **Academic Vocabulary:** | Data, scale, intersection, graph, patterns, rules, relationships, point, fraction, measurements, generate |
| **Technical Vocabulary:** | Coordinates, x-axis, y-axis, x-coordinate, y-coordinate, ordered pair, quadrant, coordinate grid, coordinate plane, coordinate system, perpendicular lines, line plot |

***Denotes connection to Personal Financial Literacy (PFL)**

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| **Unit Title** | Doctor We Still Need to Operate . . . | **Length of Unit** | 12 weeks |
| **Focusing Lens(es)** | Structure<br>Systems | **Standards and Grade Level Expectations Addressed in this Unit** | MA10-GR.5-S.1-GLE.1, MA10-GR.5-S.1-GLE.2 |
| **Inquiry Questions (Engaging-Debatable):** | • How are mathematical operations related? (MA10-GR.5-S.1-GLE.2-IQ.1)<br>• Why is zero important in our place value system? (MA10-GR.5-S.1-GLE.1-IQ.4) | | |
| **Unit Strands** | Number and Operations in Base Ten, Operations and Algebraic Thinking, Measurement and Data | | |
| **Concepts** | Measurements, equivalence, ratio, conversion, unit, measurement systems, multiplication, division, constant rate (factor), place value, decimal system, decimals, powers of ten, digits, magnitude, standard algorithm, partial products, properties of operations, distributive property, relationship, rounding, addition, subtraction, denominator, numerator, product, dividend, divisor, quotient, fractions, order of operations, solutions, compare | | |

| **Generalizations**<br>**My students will Understand that…** | **Guiding Questions**<br>**Factual** | **Conceptual** |
|---|---|---|
| A constant application of multiplication by 10 to obtain the next higher unit, or division by 10 to obtain the next lower unit, demonstrates 10 as the constant rate/factor of composing and decomposing place value units in our decimal system (MA10-GR.5-S.1-GLE.1-EO.a.i, a.ii, b.i, b.ii) | What is the relationship between 654 and 65.4?<br>What would it mean if we did not have a place value system? (MA10-GR.5-S.1-GLE.1-IQ.2)<br>What is the purpose of the decimal point? | Why is dividing by 10 the equivalent to multiplication by 1/10?<br>How does understanding our place value system help to read, write and compare decimals? |
| Multiplication or division by a power of 10 increases or decreases their place value to a magnitude equivalent to the power of 10 (MA10-GR.5-S.1-GLE.1-EO.a.i, a.ii) | What is the purpose of our place value system? (MA10-GR.5-S.1-GLE.1-IQ.3) | Why is a place value system beneficial? (MA10-GR.5-S.1-GLE.1-IQ.1)<br>Why do you move the decimal point two places to the right when multiply 100 and two places to the left when dividing by 100? |
| In the standard algorithm for multiplication of whole numbers, the power of 10 represented by the place value of the digit multiplier determines the corresponding amount to shift the partial products to the left (MA10-GR.5-S.1-GLE.2-EO.a) | What makes one strategy or algorithm better than another? (MA10-GR.5-S.1-GLE.2-IQ.2)<br>How many place values does the partial product shift when multiplying by the digit in the hundreds place? | Why do you shift partial products over one place value when multiplying by the digit in the tens place? |

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| Place value, properties of operations and the relationship between multiplication and division support the division of multi-digit numbers. (MA10-GR.5-S.1-GLE.2-EO.b) | How is multiplication used when dividing multi-digit numbers?<br>What is the role of place value in the division algorithm? | How does the relationship between multiplication and division support division when using the standard algorithm? (MA10-GR.5-S.1-GLE.2-IQ.1) |
| As with the rounding of whole numbers, the accurate rounding of decimals depends upon place value concepts and an attention to context (MA10-GR.5-S.1-GLE.1-EO.c) | How do you round a decimal number to the nearest hundredth? | How is rounding of decimal numbers similar and different from rounding whole numbers? |
| The algorithm for the addition and subtraction of decimals, a simple extension of the algorithm for whole numbers, requires precise attention to place value such that digits with corresponding place values are aligned prior to joining or separating (MA10-GR.5-S.1-GLE.2-EO.c) | How many tenths make one whole? | Why is it important that digits with the same place value are aligned when adding or subtracting using the standard algorithm? |
| The algorithm for multiplication of decimals relies on the equivalence of a decimal to a corresponding fraction with a denominator that is a power of ten (MA10-GR.5-S.1-GLE.2-EO.c) | How do you determine the location of the decimal point in the product of two decimal numbers? | How does multiplication of fractions justify the standard algorithm for multiplication of decimals? |
| The algorithm for the division of decimals dictates that the decimal point in the dividend correspond to the location of the decimal point in the quotient and when a decimal appears in the divisor both divisor and dividend both must be multiplied by the same power of ten to eliminate it (MA10-GR.5-S.1-GLE.2-EO.c) | When using the standard algorithm for division, what strategy provides a method for handling division of decimals? | Why does the multiplication of the divisor and dividend by the same power of ten create an equivalent division problem? (hint: a/b is the same as a divided by b) |
| Universal order of operation ensures uniformity and accuracy of solutions. (MA10-GR.5-S.1-GLE.2-EO.d) | What is the order of operations? | Why does order of operations matter? |

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| **Key Knowledge and Skills:** **My students will…** | *What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.* |

- Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left (MA10-GR.5-S.1-GLE.1-EO.a)
- Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10 (MA10-GR.5-S.1-GLE.1-EO.a.i, a.ii)
- Use whole number exponents to denote power of 10 (MA10-GR.5-S.1-GLE.1-EO.a.iii)
- Read and write decimals to thousandths using base-ten numerals, number names, and expanded form (MA10-GR.5-S.1-GLE.1-EO.b.i)
- Compare two decimal s to thousandths based on meanings of the digits in each place, using >, =, < symbols to record the comparisons (MA10-GR.5-S.1-GLE.1-EO.b.ii)
- Use place value understanding to round decimals to any place (MA10-GR.5-S.1-GLE.1-EO.c)
- Fluently multiply multi-digit whole numbers using the standard algorithm (MA10-GR.5-S.1-GLE.2-EO.a)
- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and the relationship between multiplication and division; illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (MA10-GR.5-S.1-GLE.2-EO.b.i, b.ii)
- Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used (MA10-GR.5-S.1-GLE.1-EO.c.i, c.ii)
- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols (MA10-GR.5-S.1-GLE.1-EO.d.i)
- Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them (MA10-GR.5-S.1-GLE.1-EO.d.ii)
- Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real world problems (MA10-GR.5-S.1-GLE.1-EO.d.i, d.ii)

**Critical Language:** includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.
EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

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| **A student in ______________ can demonstrate the ability to apply and comprehend critical language through the following statement(s):** | *When converting a 42 centimeters to meters, I first need to remember there are 100 centimeters in 1 meter. This means I will need to divide 42 centimeters by 100 to find out the equivalent number of meters, because I am dividing by a power of ten the digits will remain the same in my answer I simply move the decimal point two places to the left because 100 is 102, thus the answer is 0.42 meters.* |
| **Academic Vocabulary:** | Measurements, centimeter, meters, inches, feet, convert, conversions, parenthesis, measurement systems, multiplication, division, relationship, rounding, addition, subtraction, fractions, explain, compare, fluently |
| **Technical Vocabulary:** | Dividend, divisor, quotient, tenths, hundredths, thousandths, metric, order of operations, exponents, equivalence, units, place value, decimals, powers of ten, digits, standard algorithm, denominator, numerator, product, quotient, divisor, factor, quotient, partial products |