## Mathletics <br> Missouri Program of Studies

 Skill Quests

Grades 3-6
Mathletics
July, 2022

Mathletics

## Missouri Program of Studies

Skill Quests
July 2022
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## Grade 3

## 1 Number Sense and Operations in Base Ten

### 1.1 Use place value understanding and properties of operations to perform multidigit arithmetic

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.NBT.A.1 Round whole numbers to <br> the nearest 10 or 100. | Round to the nearest <br> 10 or 100 | Rounding numbers up to 1000 <br> to the nearest 100 |
|  | Rounding numbers up to 1000 <br> to the nearest 10 |  |
| 3.NBT.A.2 Read, write and identify <br> whole numbers within one hundred <br> thousand using base ten numerals, <br> number names and expanded form. | Read, write \& partition <br> 5-digit numbers | Reading \& writing numbers to <br> 5 digits |
| 3.NBT.A.3 Demonstrate fluency <br> with addition and subtraction <br> within 1000. | Add \& subtract within | Add \& subtract up to 3-digits: <br> number line |
|  | Add \& subtract up to 3-digits: <br> jump strategy |  |
|  | Add \& subtract two 2-digits: <br> place value blocks |  |
|  | Add \& subtract up to 3-digits: <br> expanded form |  |
|  | Add \& subtract two 2-digits: <br> compensation |  |
| 3.NBT.A.4 Multiply whole numbers <br> by multiples of 10 in the range 10- <br> 90. | Multiply by a multiple of <br> 10 | Multiplying by a multiple of 10 |

## 2 Number Sense and Operations in Fractions

### 2.1 Develop understanding of fractions as numbers

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.NF.A. 1 Understand a unit fraction <br> as the quantity formed by one part <br> when a whole is partitioned into <br> equal parts. | Introduction to <br> fractions | Introducing eighths |
| Halves, quarters \& eighths of <br> objects or shapes |  |  |
|  | Halves, thirds or quarters of <br> shapes: partitioning |  |
|  | Introducing sixths |  |
| Thirds \& sixths of objects, <br> shapes \& sets |  |  |
| 3.NF.A.2.a Describe the numerator <br> as representing the number of <br> pieces being considered. |  <br> denominator |  <br> denominator |
| 3.NF.A.3.a Understand the whole is <br> the interval from 0 to 1. | Locate unit fractions on <br> a number line | Locating unit fractions on a <br> number line |
| 3.NF.A.4 Demonstrate that two <br> fractions are equivalent if they are <br> the same size or the same point on <br> a number line. | Investigate equivalent <br> fractions | Investigating equivalent <br> fractions |
| 3.NF.A.5 Recognize and generate <br> equivalent fractions using visual <br> models, and justify why the <br> fractions are equivalent. | Find simple equivalent <br> fractions | Recognize \& generate simple <br> equivalent fractions |
| 3.NF.A.6 Compare two fractions <br> with the same numerator or <br> denominator using the symbols >, <br> or <, and justify the solution. | Compare fractions | Comparing fractions: same <br> numerator or denominator |

## 3 Relationships and Algebraic Thinking

### 3.1 Represent and solve problems involving multiplication and division

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 3.RA.A. 1 Interpret products of whole numbers. | Introduction to multiplication | Multiplying using arrays \& repeated addition |
| 3.RA.A. 2 Interpret quotients of whole numbers. | Introduction to division | Dividing by sharing (up to 50) |
|  |  | Dividing by grouping (up to 50) |
|  |  | Creating \& solving problems involving equal groups |
|  |  | Using repeated subtraction to divide |
| 3.RA.A. 4 Use multiplication and division within 100 to solve problems. | Multiplication \& division problems | Multiplication problems: fair share/equal grouping |
|  |  | Multiplication/division problems: arrays |
| 3.RA.A. 5 Determine the unknown number in a multiplication or division equation relating three whole numbers. | Multiply \& divide: finding the unknown | Multiplying \& dividing: finding the unknown |

### 3.2 Understand properties of multiplication and the relationship between multiplication and division

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.RA.B.6 Apply properties of <br> operations as strategies to multiply <br> and divide. | Multiplication <br> properties | Multiplication properties |

### 3.3 Multiply and divide within 100

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 3.RA.C. 7 Multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. Know all products of two one-digit numbers. | Multiplication \& division facts | Multiplication facts: 2, 4, 8 |
|  |  | Multiplication facts: 5, 10 |
|  |  | Multiplication facts: 3, 6, 9 |
|  |  | Multiplication facts: 7 |
|  |  | Recalling multiplication facts to $5 \times 5$ |
|  |  | Recalling multiplication facts to $10 \times 10$ |


|  |  | Division facts: $2,4,8$ |
| :--- | :--- | :--- |
|  | Division facts: 5,10 |  |
|  | Division facts: $3,6,9$ |  |
|  | Division facts: 7 |  |

### 3.4 Use the four operations to solve word problems

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.RA.D.9 Write and solve two-step <br> problems involving variables using <br> any of the four operations. | 2-step word problems: <br> 4 operations | 2-step word problems with <br> the 4 operations |

### 3.5 Identify and explain arithmetic patterns

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.RA.E.11 Identify arithmetic <br> patterns and explain the patterns <br> using properties of operations. | Number patterns | Identifying \& creating number <br> patterns |
|  | Identifying odd \& even number <br> patterns |  |
|  | Exploring number patterns in <br> tables \& charts |  |

## 4 Geometry and Measurement

### 4.1 Reason with shapes and their attributes

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.GM.A. 1 Understand that shapes <br> in different categories may share <br> attributes and that the shared <br> attributes can define a larger <br> category. | Shapes \& their <br> attributes | Sorting \& naming <br> quadrilaterals |
| 3.GM.A.2 Distinguish rhombuses <br> and rectangles as examples of <br> quadrilaterals, and draw examples <br> of quadrilaterals that do not belong <br> to these subcategories. | Recognize different <br> quadrilaterals | Recognizing between different <br> quadrilaterals |
| 3.GM.A.3 Partition shapes into <br> parts with equal areas, and express <br> the area of each part as a unit <br> fraction of the whole. | Partition shapes | Partitioning shapes into parts <br> with equal areas |

### 4.2 Solve problems involving the measurement of time, liquid volumes and weights of objects

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 3.GM.B. 4 Tell and write time to the nearest minute. | Tell \& write time to the minute | Telling time to the minute, digital \& analog |
|  |  | Using timetables |
| 3.GM.B. 5 Estimate time intervals in minutes. | Calculate elapsed time | Calculating elapsed time |
| 3.GM.B.7 Measure or estimate length, liquid volume and weight of objects. | Length | Estimating \& measuring in centimeters |
|  |  | Estimating \& measuring in centimeters \& meters |
|  | Liquid volume | Estimating, comparing \& measuring in liters |
|  |  | Liquid volume: milliliters |
|  | Mass | Mass: kilograms |
|  |  | Mass: grams |
|  |  | Mass: measuring in grams \& kilograms |
| 3.GM.B. 8 Use the four operations to solve problems involving lengths, liquid volumes or weights given in the same units. | Length, volume \& weight word problems | Solving measurement-related word problems |
|  |  | Solving word problems involving liquid volume |


|  |  | Solving 1-step word problems <br> involving mass |
| :--- | :--- | :--- |

### 4.3 Understand concepts of area

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.GM.C.9 Calculate area by using <br> unit squares to cover a plane figure <br> with no gaps or overlaps. | Measure area with unit <br> squares | Measuring area with unit <br> squares |
| 3.GM.C.10 Label area <br> measurements with squared units. | Measure area with <br> formal units | Introducing formal units for <br> area |
| Measuring the area of <br> rectangles |  |  |
| 3.GM.C.11 Demonstrate that tiling a <br> rectangle to find the area and <br> multiplying the side lengths result in <br> the same value. | Estimate area with <br> tiling | Estimating area with tiling |
| 3.GM.C.12 Multiply whole-number <br> side lengths to solve problems <br> involving the area of rectangles. | Find the area with <br> repeated addition | Finding the area of rectangles, <br> repeated addition |
| 3.GM.C.14 Decompose a rectangle <br> into smaller rectangles to find the <br> area of the original rectangle. | Find the area of <br> rectilinear figures | Finding the area of rectilinear <br> figures |

### 4.4 Understand concepts of perimeter

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.GM.D.15 Solve problems involving <br> perimeters of polygons. | Perimeter problems | Introducing perimeter |
|  | Finding the perimeter of <br> rectangles |  |
|  | Finding a missing side length <br> given the perimeter |  |
|  | Finding the perimeter of <br> polygons |  |
| 3.GM.D.16 Understand that <br> rectangles can have equal <br> perimeters but different areas, or <br> rectangles can have equal areas <br> but different perimeters. | Finding the perimeter \& area <br> of rectangles |  |
|  |  | Relating perimeter \& area |

## 5 Data and Statistics

### 5.1 Represent and analyze data

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 3.DS.A.1 Create frequency tables, <br> scaled picture graphs and bar <br> graphs to represent a data set with <br> several categories. | Scaled picture \& bar <br> graphs | Reading \& representing data: <br> scaled picture graph |
| Reading \& representing data: <br> 3caled bar graph <br> repres.A.3 Create a line plot to | Create line plots | Creating line plots |
| 3.DS.A. 4 Use data shown in a line <br> plot to answer questions. | Represent \& read data <br> in a line plot | Representing \& reading data <br> in a line plot |

## Grade 4

## 1 Number Sense and Operations in Base Ten

### 1.1 Use place value understanding and properties of operations to perform multidigit arithmetic with numbers up to one million

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 4.NBT.A. 1 Round multi-digit whole numbers to any place. | Round 6-digit numbers | Rounding 6-digit numbers to any place value |
| 4.NBT.A. 2 Read, write and identify multi-digit whole numbers up to one million using number names, base ten numerals and expanded form. | Read \& write multidigit numbers | Reading \& writing multi-digit numbers |
| 4.NBT.A. 3 Compare two multi-digit numbers using the symbols $>$, $=$ or <, and justify the solution. | Compare two 6-digit numbers | Comparing two 6-digit numbers |
| 4.NBT.A. 4 Understand that in a multi-digit whole number, a digit represents 10 times what it would represent in the place to its right. | Place value for multidigit numbers | Generalizing place value understanding |
| 4.NBT.A. 5 Demonstrate fluency with addition and subtraction of whole numbers. | Add multi-digit numbers | Adding multi-digit numbers, no regrouping |
|  |  | Adding multi-digit numbers, regrouping |
|  | Subtract multi-digit numbers | Subtracting multi-digit numbers, no regrouping |
|  |  | Subtracting multi-digit numbers, regrouping |
| 4.NBT.A. 6 Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, and justify the solution. | Multiply multi-digit numbers | Multiplying multi-digit numbers, algorithm |
|  |  | Multiplying multi-digit numbers using place value |
|  |  | Multiplying multi-digit numbers, area model |
| 4.NBT.A. 7 Find whole-number quotients and remainders with up to four-digit dividends and onedigit divisors, and justify the solution. | Divide multi-digit numbers | Dividing numbers, place value blocks |
|  |  | Dividing numbers, area model |
|  |  | Dividing numbers, place value strategy |
|  |  | Introducing remainders in division |

## 2 Number Sense and Operations in Fractions

### 2.1 Extend understanding of fraction equivalence and ordering

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.NF.A.1 Explain and/or illustrate <br> why two fractions are equivalent. | Fraction equivalence | Equivalent fractions with <br> models |
| 4.NF.A.2 Recognize and generate <br> equivalent fractions. | Generate equivalent <br> fractions | Equivalent fractions with <br> multiplication |
| 4.NF.A.3 Compare two fractions <br> using the symbols $>=$ or <, and <br> justify the solution. | Compare fractions | Compare fractions using <br> models |
|  |  | Compare fractions, different <br> numerator/denominator |
|  |  |  |

### 2.2 Extend understanding of operations on whole numbers to fraction operations

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.NF.B.4 Understand addition and <br> subtraction of fractions as <br> joining/composing and <br> separating/decomposing parts <br> referring to the same whole. | Understand <br> adding/subtracting <br> fractions |  |
|  | Adding unit fractions, same <br> denominators: models |  |
| Adding fractions, same <br> denominator |  |  |
|  | Subtracting fractions, same <br> denominator |  |
| 4dding \& subtracting <br> fractions, same denominator |  |  |
| a sum of fractions with the same <br> denominator and record each <br> decomposition with an equation <br> and justification. | Decompose fractions | Decomposing fractions |

### 2.3 Understand decimal notation for fractions, and compare decimal fractions (denominators of 10 or 100)

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.NF.C.9 Use decimal notation for <br> fractions with denominators of 10 <br> or 100. | Fractions as decimals | Introducing tenths |
|  | Introducing hundredths |  |
| 4.NF.C.10 Understand that <br> fractions and decimals are <br> equivalent representations of the <br> same quantity. |  <br> decimal equivalence |  <br> decimal equivalences |
| 4.NF.C.11 Read, write and identify <br> decimals to the hundredths place <br> using number names, base ten <br> numerals and expanded form. | Introduce decimal <br> notation | Introducing decimal notation |
| 4.NF.C.12 Compare two decimals to <br> the hundredths place using the <br> symbols >, = or <, and justify the <br> solution. | Compare decimals to <br> hundredths | Comparing \& ordering <br> decimals to hundredths |

## 3 Relationships and Algebraic Thinking

### 3.1 Use the four operations with whole numbers to solve problems

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.RA.A.1 Multiply or divide to solve <br> problems involving a multiplicative <br> comparison. | Comparison word <br> problems | Solving comparison word <br> problems |
| 4.RA.A.2 Solve multi-step whole <br> number problems involving the four <br> operations and variables and using <br> estimation to interpret the <br> reasonableness of the answer. | Word problems: 4 <br> operations | Multi-step <br> multiplication/division word <br> problems |
| Solving multiplication word <br> problems |  |  |
| 2-step addition \& subtraction <br> word problems |  |  |
| 4.RA.A.3 Solve whole number <br> division problems involving <br> variables in which remainders need <br> to be interpreted, and justify the <br> solution. | Solve division word <br> problems | Solving division word <br> problems |

### 3.2 Work with factors and multiples

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.RA.B.4 Recognize that a whole <br> number is a multiple of each of its <br> factors and find the multiples for a <br> given whole number. | Factors \& multiples | Finding multiples: whole <br> numbers up to 100 |
| 4.RA.B.5 Determine if a whole <br> number within 100 is composite or factors: whole <br> prime, and find all factor pairs for <br> nhole numbers within 100. | Prime \& composite <br> numbers to 100 |  |

### 3.3 Generate and analyze patterns

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.RA.C.6 Generate a number <br> pattern that follows a given rule. | Number \& shape <br> patterns | Generate shape patterns from <br> a given rule |
|  | Generate addition patterns <br> from a given rule |  |
|  | Generate subtraction patterns <br> from a given rule |  |



## 4 Geometry and Measurement

### 4.1 Classify 2-dimensional shapes by properties of their lines and angles

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.GM.A.1 Draw and identify points, <br> lines, line segments, rays, angles, <br> perpendicular lines and parallel <br> lines. | Spatial features in 2-D <br> figures | Classifying angles |
| 4.GM.A.2 Classify two-dimensional <br> shapes by their sides and/or angles. | Classify 2-D figures | Labeling points \& lines <br> 2-D shapes |
|  | Classifying plane shapes by <br> their spatial features |  |
|  | Classifying triangles by their <br> sides \& angles |  |
| 4.GM.A.3 Construct lines of <br> symmetry for a two-dimensional <br> figure. | Lines of symmetry | Lines of symmetry |

### 4.2 Understand the concepts of angle and measure angles

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.GM.B.5 Draw and measure <br> angles in whole-number degrees <br> using a protractor. | Measure \& estimate <br> angles | Measuring \& estimating <br> angles |

### 4.3 Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 4.GM.C. 6 Know relative sizes of measurement units within one system of units. | Convert units of measure | Units of length: $\mathrm{mm} / \mathrm{cm} / \mathrm{m} / \mathrm{km}$ |
|  |  | Units of mass: $\mathrm{g} / \mathrm{kg} \mathrm{\&} \mathrm{oz/lb}$ |
|  |  | Units of time: sec/min/hr \& day/week/year |
|  |  | Units of volume \& capacity: $\mathrm{mL} / \mathrm{L}$ |
| 4.GM.C.7 Use the four operations to solve problems involving distances, intervals of time, liquid volume, weight of objects and money. | Word problems: units of measure | Length word problems |
|  |  | Mass word problems |
|  |  | Elapsed time word problems |
|  |  | Volume \& capacity word problems |
|  |  | Money word problems |
|  | Area \& perimeter | Finding the area of a rectangle, formula |


| 4.GM.C.8 Apply the area and <br> perimeter formulas for rectangles to <br> solve problems. | Finding the perimeter of a <br> rectangle, formula |
| :--- | :--- | :--- |

## 5 Data and Statistics

### 5.1 Represent and analyze data

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 4.DS.A.1 Create a frequency table <br> and/or line plot to display <br> measurement data. | Create line plots | Creating line plots |
| 4.DS.A.2 Solve problems involving <br> addition and subtraction by using <br> information presented in a data <br> display. | Create \& analyze data <br> displays | Creating \& analyzing data <br> displays |
| 4.DS.A.3 Analyze the data in a <br> frequency table, line plot, bar graph <br> or picture graph. | Analyze data |  <br> picture graphs |

## Grade 5

## 1 Number Sense and Operations in Base Ten

### 1.1 Use place value system understanding to perform operations with multi-digit whole numbers to billions and decimals to thousandths

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.NBT.A. 1 Read, write and identify <br> numbers from billions to <br> thousandths using number names, <br> base ten numerals and expanded <br> form. | Read, write \& identify <br> numbers: any size | Reading, writing \& identifying <br> numbers: any size |
| 5.NBT.A.2 Compare two numbers <br> from billions to thousandths using <br> the symbols >, = or <, and justify the <br> solution. | Compare \& order <br> numbers | Comparing \& ordering <br> numbers of any size |
| 5.NBT.A.3 Understand that in a <br> multi-digit number, a digit <br> represents $1 / 10$ times what it <br> would represent in the place to its <br> left. | The place value system | Identifying the place value of a <br> digit in a number |
| 5.NBT.A.4 Evaluate the value of <br> powers of 10 and understand the <br> relationship to the place value <br> system. | Multiply \& divide by <br> powers of 10 | Mnderstanding the place value <br> system: powers of 10 |
| powers of 10 |  |  |


| 5.NBT.A. 8 Divide multi-digit whole <br> numbers and decimals to the <br> hundredths place using up to two- <br> digit divisors and four-digit <br> dividends, and justify the solution. | Divide whole numbers <br> \& decimals |  <br> decimals, mental strategies |
| :--- | :--- | :--- |
|  |  |  <br> decimals, algorithm |

## 2 Number Sense and Operations in Fractions

### 2.1 Understand the relationship between fractions and decimals (denominators that are factors of 100)

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.NF.A.2 Convert decimals to <br> fractions and fractions to decimals. | Convert between <br> fractions \& decimals | Converting between fractions <br> \& decimals |
| 5.NF.A.3 Compare and order <br> fractions and/or decimals to the <br> thousandths place using the <br> symbols $>,=$ or $<$, and justify the <br> solution. | Compare decimals to <br> thousandths | Comparing \& ordering <br> decimals to thousandths |

### 2.2 Perform operations and solve problems with fractions and decimals

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.NF.B.5.b Explain why multiplying <br> a given number by a fraction <br> greater than 1 results in a product <br> larger than the given number. | Effects of multiplying <br> fractions | Interpreting multiplying <br> fractions as scaling |
| 5.NF.B.6 Solve problems involving <br> addition and subtraction of <br> fractions and mixed numbers with <br> unlike denominators, and justify the <br> solution. | Add \& subtract <br> fractions | Adding fractions \& mixed <br> numbers |
|  |  | Subtracting fractions \& mixed <br> numbers |
|  | Adding \& subtracting fractions <br> \& mixed numbers |  |
|  |  <br> improper |  |
|  | Adding mixed numbers |  |
|  <br> improper |  |  |
| Subtracting mixed numbers |  |  |
| 5.NF.B.7.a Recognize the <br> relationship between multiplying <br> fractions and finding the areas of <br> rectangles with fractional side <br> lengths. | Area of a rectangle, <br> fractional sides | Find the area of a rectangle <br> with fractional sides |
| 5.NF.B.7.b Calculate and interpret <br> the product of a fraction by a whole <br> number and a whole number by a <br> fraction. | Multiply fractions | Multiplying a fraction by a <br> whole number |
| 5.NF.B.8.a Calculate and interpret <br> the quotient of a unit fraction by a <br> non-zero whole number. | Divide unit fractions by <br> whole numbers | Multiplying a fraction by a <br> fraction |
| wholing unit fractions by |  |  |
| whumbers, models |  |  |


| 5.NF.B.8.b Calculate and interpret <br> the quotient of a whole number by <br> a unit fraction. | Divide whole numbers <br> by unit fractions | Dividing whole numbers by <br> unit fractions, models |
| :--- | :--- | :--- |

## 3 Relationships and Algebraic Thinking

### 3.1 Represent and analyze patterns and relationships

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.RA.A.1.a Generate two numeric <br> patterns given two rules. | Numerical patterns | Comparing 2 numerical <br> patterns |
| Interpreting \& creating a <br> number pattern table |  |  |
| 5.RA.A.1.b Translate two numeric <br> patterns into two sets of ordered <br> pairs. | Graph numerical <br> patterns | Graphing ordered pairs from <br> numerical patterns |
| 5.RA.A.2 Write a rule to describe or <br> explain a given numeric pattern. | Write pattern rules |  <br> decreasing pattern rules |

### 3.2 Write and interpret numerical expressions

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.RA.B.3 Write, evaluate and <br> interpret numeric expressions using <br> the order of operations. | Write \& interpret <br> expressions | Writing \& interpreting <br> expressions without solving |
| 5.RA.B.4 Translate written <br> expressions into algebraic <br> expressions. | Write algebraic <br> expressions | Writing algebraic expressions |

## 4 Geometry and Measurement

### 4.1 Classify two- and three-dimensional geometric shapes

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.GM.A. 1 Understand that <br> attributes belonging to a category <br> of figures also belong to all <br> subcategories. | Attributes of 2-D <br> figures | Sorting plane shapes |
| 5.GM.A.2 Classify figures in a <br> hierarchy based on properties. | Classify 2-D figures, <br> properties | Classifying 2-D figures in a <br> hierarchy |
|  | Classifying quadrilaterals |  |
| 5.GM.A.3 Analyze and describe the <br> properties of prisms and pyramids. | Prisms \& pyramids | Investigating properties of <br> prisms \& pyramids |

### 4.2 Understand and compute volume

## Outcome

Quests
Content
5.GM.B.4.b Understand that the volume of a right rectangular prism can be found by stacking multiple layers of the base.
5.GM.B.5 Apply the formulas $V=I \times w \times h$ and $V=B \times h$ for volume of right rectangular prisms with whole-number edge lengths.

### 4.3 Graph points on the Cartesian coordinate plane within the first quadrant to solve problems

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.GM.C.6.a Represent the axes as <br> scaled perpendicular number lines <br> that both intersect at 0, the origin. | The coordinate plane | Introducing the coordinate <br> plane |
| 5.GM.C.6.b Identify any point on the <br> Cartesian coordinate plane by its <br> ordered pair coordinates. | Locate \& plot points in <br> the 1st quadrant | Locating \& plotting points in <br> the 1st quadrant |
| 5.GM.C. Plot and interpret points <br> in the first quadrant of the <br> Cartesian coordinate plane. | Graph in the first <br> quadrant | Graphing in the first quadrant |

### 4.4 Solve problems involving measurement and conversions within a measurement system

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 5.GM.D. 8 Convert measurements of capacity, length and weight within a given measurement system. | Convert measurement units | Converting between standard metric units of length |
|  |  | Converting between standard metric units of mass |
|  |  | Converting metric units of volume \& capacity |
|  |  | Converting between customary units of length |
|  |  | Converting customary units of volume \& capacity |
|  |  | Converting between customary units of mass |
| 5.GM.D. 9 Solve multi-step problems that require measurement conversions. | Multi-step conversion problems | Word problems: measurement conversions |

## 5 Data and Statistics

### 5.1 Represent and analyze data

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 5.DS.A.1 Create a line graph to <br> represent a data set, and analyze <br> the data to answer questions and <br> solve problems. | Represent \& read data <br> in a line graph | Representing \& reading data <br> in a line graph |
| 5.DS.A.2 Create a line plot to <br> represent a given or generated data <br> set, and analyze the data to answer <br> questions and solve problems, <br> recognizing the outliers and <br> generating the median. | Fraction problems: line <br> plots | Represent \& interpret <br> measurements: line plots |

## Grade 6

## 1 Ratios and Proportional Relationships

### 1.1 Understand and use ratios to solve problems

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 6.RP.A.1 Understand a ratio as a <br> comparison of two quantities and <br> represent these comparisons. | Introduction to ratios |  <br> writing ratios |
| 6.RP.A.2 Understand the concept of <br> a unit rate associated with a ratio, <br> and describe the meaning of unit <br> rate. | Introduction to unit rate |  <br> making comparisons |
| 6.RP.A.3.a Create tables of <br> equivalent ratios, find missing <br> values in the tables and plot the <br> pairs of values on the Cartesian <br> coordinate plane. | Ratio tables | Creating tables of equivalent <br> ratios |
| 6.RP.A.3.b Solve unit rate problems. | Unit rate | Solving unit rate problems for <br> given time periods |
| Solving unit rate problems <br> involving unit pricing |  |  |
| 6.RP.A.3.c Solve percent problems. | Percent of a quantity | Expressing rates as a percent |
| Solving percent problems: <br> finding the whole |  |  |
| 6.RP.A.3.d Convert measurement <br> units within and between two <br> systems of measurement. | Convert measurements <br> using ratios | Converting measurement units <br> using ratios |

## 2 Number Sense and Operations

### 2.1 Apply and extend previous understandings of multiplication and division to divide fractions by fractions

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 6.NS.A.1.a Solve problems involving <br> division of fractions by fractions. | Divide fractions | Dividing a fraction by a <br> fraction |
|  | Dividing fractions \& mixed <br> numbers |  |

### 2.2 Compute with non-negative multi-digit numbers, and find common factors and multiples

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 6.NS.B. 2 Demonstrate fluency with division of multi-digit whole numbers. | Divide multi-digit numbers, algorithm | Divide 4-digit by 2-digit numbers, no remainder |
|  |  | Divide 4-digit by 2-digit numbers, with remainders |
|  |  | Divide 4-digit by 2-digit numbers |
| 6.NS.B. 3 Demonstrate fluency with addition, subtraction, multiplication and division of decimals. | Operations with multidigit decimals | Adding decimals using the standard algorithm |
|  |  | Subtracting decimals using the standard algorithm |
|  |  | Multiplying decimals using the standard algorithm |
|  |  | Dividing decimals using the standard algorithm |
|  |  | Word problems: adding \& subtracting decimals |
|  |  | Word problems: multiplying \& dividing decimals |
| 6.NS.B.4.a Find the greatest common factor (GCF) and the least common multiple (LCM). | GCF \& LCM | Greatest common factor |
|  |  | Least common multiple |
|  |  | Solving word problems: factors \& multiples |
| 6.NS.B.4.b Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers. | Factor using the distributive property | Factoring using the distributive property |

### 2.3 Apply and extend previous understandings of numbers to the system of rational numbers

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 6.NS.C.5 Use positive and negative <br> numbers to represent quantities. | Positive \& negative <br> numbers | Investigating \& interpreting <br> integers |
| 6.NS.C.6.a Locate rational numbers <br> on a horizontal or vertical number <br> line. | Graph rational <br> numbers | Placing rational numbers on <br> the number line |
| Graphing rational numbers on <br> the coordinate plane |  |  |
| 6.NS.C.6.b Write, interpret and <br> explain problems of ordering of <br> rational numbers. | Order rational numbers | Exploring the everyday <br> language of integers |
| Statements of order: rational <br> numbers |  |  |
| 6.NS.C.7 Understand that the <br> absolute value of a rational number <br> is its distance from 0 on the number <br> line. | Introduction to absolute <br> value | Introducing absolute value |
| 6.NS.C.8 Extend prior knowledge to <br> generate equivalent <br> representations of rational numbers <br> between fractions, decimals and <br> percentages (limited to terminating <br> decimals and/or benchmark <br> fractions of $1 / 3$ and $2 / 3$ ). | Equivalent <br> representations | Finding equivalent <br> representations |

### 2.4 Apply and extend previous understandings of arithmetic to algebraic expressions

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 6.EEI.A.2.a Identify parts of an <br> expression using mathematical <br> terminology. | Parts of an expression | Identifying parts of an <br> expression |
| 6.EEI.A.2.b Evaluate expressions at <br> specific values of the variables. | Evaluate algebraic <br> expressions | Evaluating algebraic <br> expressions |
| Evaluating expressions using <br> order of operations |  |  |
| 6.EEI.A.2.c Evaluate non-negative <br> rational number expressions. | Evaluate rational <br> number expressions | Evaluating rational number <br> expressions |
| 6.EEI.A.2.d Write and evaluate <br> algebraic expressions. | Write algebraic <br> expressions | Writing algebraic expressions |
| 6.EEI.A.3 Identify and generate <br> equivalent algebraic expressions <br> using mathematical properties. | Equivalent expressions | Identifying equivalent <br> expressions |

### 2.5 Reason about and solve one-variable equations and inequalities

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 6.EEI.B. 4 Use substitution to determine whether a given number in a specified set makes a onevariable equation or inequality true. | Test solutions | Testing solutions: equations |
|  |  | Testing solutions: inequalities |
| 6.EEI.B. 6 Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation. | Write \& solve an equation | Writing \& solving equations |
| 6.EEI.B. 7 Solve one-step linear equations in one variable involving non-negative rational numbers. | Solve 1-step equations | Preserving equality in equations |
|  |  | Solving simple linear equations using models |
|  |  | 1-step equations: add/subtract, positive integers |
|  |  | 1-step equations: add/subtract, rational numbers |
|  |  | 1-step equations: multiply, positive integers |
|  |  | 1-step equations: multiply, rational numbers |
|  |  | 1-step equations: division, rational numbers |
|  |  | Writing \& solving 1-step equations |
| 6.EEI.B.8.a Write an inequality of the form $x>c, x<c, x \geq c$, or $x \leq c$ to represent a constraint or condition. | Write \& represent inequalities | Writing inequalities |
|  |  | Represent algebraic inequalities on a number line |

### 2.6 Represent and analyze quantitative relationships between dependent and independent variables

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 6.EEI.C.9.a Write an equation to <br> express one quantity, the <br> dependent variable, in terms of the <br> other quantity, the independent <br> variable. |  <br> independent variables |  <br> independent variables |

## 3 Geometry and Measurement

### 3.1 Solve problems involving area, surface area and volume

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 6.GM.A. 1 Find the area of polygons by composing or decomposing the shapes into rectangles or triangles. | Area: triangles \& quadrilaterals | Finding the area of a right triangle |
|  |  | Investigating the area of special quadrilaterals |
|  |  | Real-world area problems: special quadrilaterals |
| 6.GM.A.2.a Understand that the volume of a right rectangular prism can be found by filling the prism with multiple layers of the base. | Volume: rectangular prisms | Calculating the volume of a rectangular prism |
| 6.GM.A.2.b Apply $\mathrm{V}=\mathrm{I}^{*} \mathrm{w}$ * h and $V=B h$ to find the volume of right rectangular prisms. | Volume: rectangular prisms, formula | Volume: rectangular prisms, fraction edge lengths |
| 6.GM.A.3.a Understand signs of numbers in ordered pairs as indicating locations in quadrants of the Cartesian coordinate plane. | Graph in the 4 quadrants | Graphing coordinates in the 4 quadrants |
| 6.GM.A.3.b Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. | Graph coordinates across the $x-\& y$-axis | Graphing coordinates across the $x$-axis \& $y$-axis |
| 6.GM.A.3.c Find distances between points with the same first coordinate or the same second coordinate. | Find distances between points | Finding distances between points |
| 6.GM.A.3.d Construct polygons in the Cartesian coordinate plane. | Polygons in the coordinate plane | Drawing polygons in the coordinate plane |
| 6.GM.A.4.a Represent threedimensional figures using nets made up of rectangles and triangles. | Connect 3-D objects with their nets | Connecting 3-D objects with their nets |
| 6.GM.A.4.b Use nets to find the surface area of three-dimensional figures whose sides are made up of rectangles and triangles. | Calculate surface area by using nets | Calculating surface area of rectangular prisms |

## 4 Data Analysis, Statistics and Probability

### 4.1 Develop understanding of statistical variability

| Outcome | Quests | Content |
| :--- | :--- | :--- |
| 6.DSP.A.1 Recognize a statistical <br> question as one that anticipates <br> variability in the data related to the <br> question and accounts for it in the <br> answers. | Statistical questions | Evaluating statistical <br> questions |
| 6.DSP.A.2 Understand that a set of <br> data collected to answer a <br> statistical question has a <br> distribution which can be described <br> by its center, spread and overall <br> shape. | Shape of data <br> distribution | Introducing the shape of data <br> distribution |
| 6.DSP.A.3 Recognize that a <br> measure of center for a numerical <br> data set summarizes all of its <br> values with a single number, while <br> a measure of variation describes <br> how its values vary from a single <br> number. |  <br> variation |  |

### 4.2 Summarize and describe distributions

| Outcome | Quests | Content |
| :---: | :---: | :---: |
| 6.DSP.B.4.a Use dot plots, histograms and box plots to display and interpret numerical data. | Data displays | Constructing data displays |
|  |  | Reading \& interpreting data in a dot plot |
|  |  | Reading \& interpreting data in a histogram |
|  |  | Reading \& interpreting box plots |
| 6.DSP.B.4.b Create and interpret circle graphs. | Create \& interpret circle graphs | Creating \& interpreting circle graphs |
| 6.DSP.B. 5 Summarize numerical data sets in relation to the context. | Summarize numerical data | Summarizing numerical data |
| 6.DSP.B.5.a Report the number of observations. | Report observations | Reporting observations in a data display |
| 6.DSP.B.5.b Describe the nature of the attribute under investigation, including how it was measured and its units of measurement. | Attributes of data | Describing attributes of data in data displays |


| 6.DSP.B.5.c Give 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 of the data. | Calculate measures of center \& variation | Calculating the mean absolute deviation |
| :---: | :---: | :---: |
|  |  | Calculating the median |
|  |  | Calculating the mean |
|  |  | Identifying clusters, gaps \& outliers |
|  |  | Identifying skewed \& symmetrical sets of data |
| 6.DSP.B.5.d Analyze the choice of measures of center and variability based on the shape of the data distribution and/or the context of the data. | Relate measures of center \& variation | Choosing appropriate measures of center/variation |
|  |  | Comparing measures of center \& variation |

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