Young Scholars of Western Pennsylvania Charter School

5th Mathematics YSWPCS

- Units

Unit 1 - Number Theory

Concepts

Introduction to the Student Reference Book, Rectangular Arrays, Factors, Divisibility, Prime and Composite Numbers, Square Numbers, Unsquaring Numbers, Factor Strings and Prime Factorizations

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

PA Eligible Content

M05.B-O.1.1.1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.B-O.1.1.2 Write simple expressions that model calculations with numbers, and interpret numerical expressions without evaluating them. *Example 1: Express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Example 2: Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.*

M05.A-T.1.1.2 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. Use whole-number exponents to denote powers of 10. *Example 1: 4 × 102 = 400 Example 2: 0.05 ÷ 103 = 0.00005*

M05.A-F.2.1.3 Demonstrate an understanding of multiplication as scaling (resizing). *Example 1: Comparing 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. Example 2: Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.

Common Core State Standards

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

5.NBT.2. 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. Use whole-number exponents to denote powers of 10.

5.NF.5. Interpret multiplication as scaling (resizing), by: **a.** Comparing 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.

Vocabulary

Commutative Property of Multiplication, composite number, divisibility rule, divisible by, even number, exponent, exponent key, exponential notation, factor, factor pair, factor rainbow, factor string, length of factor string, name-collection box, number model, odd number, prime factorization, prime number, product, quotient, rectangular array, remainder, square array, square number, square root, square-root key, turn-around rule (for multiplication), unsquaring a number

Assessment(s)

Beginning of the Year Assessment

Daily Assessments - Page 8

Progress Check 1 (Unit 1 Test)

Duration

13 Days

- ## Units

Unit 2 - Estimation and Computation

Concepts

Estimation Challenge, Addition of Whole Numbers and Decimals, Subtraction of Whole Numbers and Decimals, Addition and Subtraction Number Stories, Estimating Reaction Time, Chance Events, Estimating Products, Multiplication of Whole Numbers and Decimals, The Lattice Method of Multiplication, Comparing Millions, Billions, and Trillions

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.

2.4.5.A.1 Solve problems using conversions within a given measurement system.

2.4.5.A.4 Solve problems involving computation of fractions using information provided in a line plot.

PA Eligible Content

M05.B-O.1.1.1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.B-O.1.1.2 Write simple expressions that model calculations with numbers, and interpret numerical expressions without evaluating them. *Example 1: Express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Example 2: Recognize that $3 \times (18,932 + 921)$ is three times as large as $18,932 + 921$, without having to calculate the indicated sum or product.*

M05.A-T.1.1.1 Demonstrate an understanding that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left. *Example: Recognize that in the number 770, the 7 in the tens place is 1/10 the 7 in the hundreds place.*

M05.A-T.1.1.2 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. Use whole-number exponents to denote powers of 10. *Example 1: $4 \times 10^2 = 400$ Example 2: $0.05 \div 10^3 = 0.00005$*

M05.A-T.1.1.3 Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. *Example: $347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (0.1) + 9 \times (0.01) + 2 \times (0.001)$*

M05.A-T.1.1.4 Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols.

M05.A-T.1.1.5 Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

M05.A-T.2.1.3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.D-M.1.1.1 Convert among different-sized measurement units within a given measurement system. **A table of equivalencies will be provided.** *Example: Convert 5 cm to meters.*

M05.D-M.2.1.1 Solve problems involving computation of fractions by using information presented in line plots.

Common Core State Standards

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

5.NBT.1 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.

5.NBT.2. 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. Use whole-number exponents to denote powers of 10.

5.NBT.3. Read, write, and compare decimals to thousandths. **a.** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

5.NBT.3. Read, write, and compare decimals to thousandths. **b.** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

5.NBT.4. Use place value understanding to round decimals to any place.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For*

example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

Vocabulary

algorithm, ballpark estimate, certain, column-addition method, difference, digit, elapsed time, estimate, expanded notation, false number sentence, impossible, lattice, lattice method, magnitude estimate, maximum, mean (average), median, minimum, minuend, mode, number sentence, open number sentence, operation symbol, partial-differences method, partial-products method, partial-sums method, place, place value, Probability Meter Poster, range, reaction time, relation symbol, sample, solution, stimulus, subtrahend, trade-first method, true number sentence, value, variable

Assessment(s)

Daily Assessments - Page 72

Progress Check 2 (Unit 2 Test)

Duration

14 Days

- Units

Unit 3 - Geometry Explorations and the American Tour

Concepts

Introduction to the American Tour, Population Data, Exploring Angle Measures, Using a Protractor, Using a Compass, Congruent Triangles, Properties of Polygons, Regular Tessellations, Angles of Polygons, Geometry Template

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

2.3.5.A.2 Classify two-dimensional figures into categories based on an understanding of their properties.

PA Eligible Content

M05.B-O.1.1.2 Write simple expressions that model calculations with numbers, and interpret numerical expressions without evaluating them. *Example 1: Express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Example 2: Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.*

M05.A-T.1.1.3 Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. *Example: 347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (0.1) + 9 × (0.01) + 2 × (0.001)*

M05.A-T.1.1.4 Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols.

M05.A-T.1.1.5 Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

M05.A-F.2.1.3 Demonstrate an understanding of multiplication as scaling (resizing). *Example 1: Comparing 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. Example 2: Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.*

M05.C-G.2.1.1 Classify two-dimensional figures in a hierarchy based on properties. *Example 1: All polygons have at least 3 sides and pentagons are polygons, so all pentagons have at least 3 sides. Example 2: A rectangle is a parallelogram, which is a quadrilateral, which is a polygon; so, a rectangle can be classified as a parallelogram, as a quadrilateral, and as a polygon.*

Common Core State Standards

5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

5.NBT.3. Read, write, and compare decimals to thousandths. **a.** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

5.NBT.3. Read, write, and compare decimals to thousandths. **b.** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

5.NBT.4. Use place value understanding to round decimals to any place.

5.NF.5. Interpret multiplication as scaling (resizing), by: **a.** Comparing 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.

5.G.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For

example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

5.G.4. Classify
two-dimensional figures in a hierarchy based on properties

Vocabulary

acute angle, adjacent angles, arc, census, congruent, diameter, equilateral triangle, Geometry Template, isosceles triangle, obtuse angle, pentagon, perimeter, polygon, quadrangle, radius, reflex angle, regular polygon, regular tessellation, right angle, scalene triangle, straight angle, tessellate, tessellation, tessellation vertex, vertical (or opposite) angles

Assessment(s)

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Progress Check 3 (Unit 3 Test)

Duration

14 Days

- Units

Unit 4 - Division

Concepts

Division Facts and Extensions, Partial-Quotients Division Algorithm, Finding Distances on a Map, Partial-Quotients Algorithm Strategies, Division of Decimal Numbers, Interpreting the Remainder, First to 100

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

2.3.5.A.2 Classify two-dimensional figures into categories based on an understanding of their properties.

PA Eligible Content

M05.B-O.1.1.1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.B-O.1.1.2 Write simple expressions that model calculations with numbers, and interpret numerical expressions without evaluating them. *Example 1: Express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Example 2: Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.*

M05.A-T.1.1.2 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. Use whole-number exponents to denote powers of 10. *Example 1: 4 × 102 = 400 Example 2: 0.05 ÷ 103 = 0.00005*

M05.A-T.2.1.2 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.

M05.A-T.2.1.3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.2.1.3 Demonstrate an understanding of multiplication as scaling (resizing). *Example 1: Comparing 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. Example 2: Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.*

M05.C-G.2.1.1 Classify two-dimensional figures in a hierarchy based on properties. *Example 1: All polygons have at least 3 sides and pentagons are polygons, so all pentagons have at least 3 sides. Example 2: A rectangle is a parallelogram, which is a quadrilateral, which is a polygon; so, a rectangle can be classified as a parallelogram, as a quadrilateral, and as a polygon.*

Common Core State Standards

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

5.NBT.2. 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. Use whole-number exponents to denote powers of 10.

5.NBT.6 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/or the relationship between

multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.5. Interpret multiplication as scaling (resizing), by: **a.** Comparing 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.

5.G.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

5.G.4. Classify two-dimensional figures in a hierarchy based on properties.

Vocabulary

decimal point, dividend, divisor, magnitude estimate, map legend, map key, map scale, multiples, partial quotient, quotient, remainder, variable

Assessment(s)

Daily Assessments - Page 222

Progress Check 4 (Unit 4 Test)

Duration

11 Days

- Units

Unit 5 - Fractions, Decimals, and Percents

Concepts

Fraction Review, Mixed Numbers, Comparing and Ordering Fractions, Two Rules fro Finding Equivalent Fractions, Fractions and Decimals, Using a Calculator to Convert Fractions to Percents, Bar and Circle Graphs, Reading Circle Graphs, Making Circle Graphs

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.

2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

PA Eligible Content

M05.B-O.1.1.1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.A-T.1.1.3 Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. *Example: 347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (0.1) + 9 × (0.01) + 2 × (0.001)*

M05.A-T.1.1.5 Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

M05.A-T.2.1.3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.1.1.1 Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) *Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*

M05.A-F.2.1.1 Solve word problems involving division of whole numbers leading to answers in the form of fractions (including mixed numbers).

Common Core State Standards

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.NBT.3. Read, write, and compare decimals to thousandths. **a.** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

5.NBT.4. Use place value understanding to round decimals to any place.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.1 Add and subtract fractions 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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

Vocabulary

bar graph, benchmark, circle (pie) graph, denominator, equivalent fractions, fraction stick, improper fraction, mixed number, numerator, percent, Percent Circle, repeating decimal, round down, round to the nearest..., round up, sector, unit fraction, whole (ONE, or unit)

Assessment(s)

Daily Assessments - Page 282

Progress Check 5 (Unit 5 Test)

Duration

16 Days

- Units

Unit 6 - Using Data; Addition and Subtraction of Fractions

Concepts

Organizing Data, Natural Measures of Length, Stem-and-Leaf Plots, Line Plots, Sample Size and Sound Conclusions, Analysis of Sample Data, Analyzing Contour Maps, Using Benchmarks with Fraction Addition and Subtraction, Clock Fractions and Common Denominators

PA Common Core Standards

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.

2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

2.4.5.A.1 Solve problems using conversions within a given measurement system.

2.4.5.A.4 Solve problems involving computation of fractions using information provided in a line plot.

PA Eligible Content

M05.A-T.1.1.3 Read and write decimals to thousandths using base-ten numerals, word form, and expanded form. *Example: 347.392 = 300 + 40 + 7 + 0.3 + 0.09 + 0.002 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (0.1) + 9 × (0.01) + 2 × (0.001)*

M05.A-T.1.1.5 Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

M05.A-T.2.1.3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.1.1.1 Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) *Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*

M05.A-F.2.1.1 Solve word problems involving division of whole numbers leading to answers in the form of fractions (including mixed numbers).

M05.A-F.2.1.3 Demonstrate an understanding of multiplication as scaling (resizing). *Example 1: Comparing 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. Example 2: Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.*

M05.D-M.1.1.1 Convert among different-sized measurement units within a given measurement system. **A table of equivalencies will be provided.** *Example: Convert 5 cm to meters.*

M05.D-M.2.1.1 Solve problems involving computation of fractions by using information presented in line plots.

Common Core State Standards

5.NBT.3. Read, write, and compare decimals to thousandths. **a.** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

5.NBT.4. Use place value understanding to round decimals to any place.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.1 Add and subtract fractions 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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

5.NF.5. Interpret multiplication as scaling (resizing), by: **b**. Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1.

5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

Vocabulary

angles of seperation, climate, common denominator, contour line, contour map, cubit, fair game, fathom, frequency table, great span, landmark, leaf, line plot, map legelnd (map key), maximum, median, minimum, mode, normal span, population, precipitation, quick common denominator, sample, simplest form, span, stem, stem-and-leaf plot, survey, unlike denominators

Assessment(s)

Mid-Year Assessment

Daily Assessments - Page 370

Progress Check 6 (Unit 6 Test)

Duration

14 Days

- Units

Unit 7 - Exponents and Negative Numbers

Concepts

Exponential Notation, Exponential Notation for Powers of 10, Scientific Notation, Parentheses in Number Sentences, Order of Operations, Line Graphs, Using Negative Numbers, Addition of Positive and Negative Numbers, Subtraction of Positive and Negative Numbers, Line Plots, Calculator Practice with Negative Numbers

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.

2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

2.4.5.A.4 Solve problems involving computation of fractions using information provided in a line plot.

PA Eligible Content

M05.B-O.1.1.1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.B-O.1.1.2 Write simple expressions that model calculations with numbers, and interpret numerical expressions without evaluating them. *Example 1: Express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Example 2: Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.*

M05.A-T.1.1.1 Demonstrate an understanding that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left. *Example: Recognize that in the number 770, the 7 in the tens place is 1/10 the 7 in the hundreds place.*

M05.A-T.1.1.2 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. Use whole-number exponents to denote powers of 10. *Example 1: 4 × 102 = 400 Example 2: 0.05 ÷ 103 = 0.00005*

M05.A-T.1.1.4 Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols.

M05.A-T.2.1.1 Multiply multi-digit whole numbers (not to exceed 3-digit by 3-digit).

M05.A-T.2.1.2 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.

M05.A-T.2.1.3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.1.1.1 Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) *Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*

M05.A-F.2.1.1 Solve word problems involving division of whole numbers leading to answers in the form of fractions (including mixed numbers).

M05.D-M.2.1.1 Solve problems involving computation of fractions by using information presented in line plots.

Common Core State Standards

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

5.NBT.1 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.

5.NBT.2. 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. Use whole-number exponents to denote powers of 10.

5.NBT.3. Read, write, and compare decimals to thousandths. **b.** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.6 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/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.1 Add and subtract fractions 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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

Vocabulary

account balance, ambiguous, axis

base, change-sign key (+/-), debt, expanded notation, exponent, exponential notation, expression, factor, in the black, in the red, line graph, negative number, nested parentheses, number-and-word notation, opposite, order of operations, powers of 10, power of a number, scientific notation, standard notation, trend, Venn diagram

Assessment(s)

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Progress Check 7 (Unit 7 Test)

Duration

15 Days

- Units

Unit 8 - Fractions and Ratios

Concepts

Comparing Fractions, Adding Mixed Numbers, Subtracting Mixed Numbers, Calculator Computations with Fractions, Fractions of Fractions, Area Model for Fraction Multiplication, Multiplication of Fractions and Whole Numbers, Multiplication of Mixed Numbers, Finding a Percent of a Number, Relating Fractional Units to the Whole, Fraction Division

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

2.3.5.A.2 Classify two-dimensional figures into categories based on an understanding of their properties.

PA Eligible Content

M05.B-O.1.1.1 Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.A-F.1.1.1 Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) *Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*

M05.A-F.2.1.3 Demonstrate an understanding of multiplication as scaling (resizing). *Example 1: Comparing 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. Example 2: Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.

M05.A-F.2.1.2 Multiply a fraction (including mixed numbers) by a fraction.

M05.A-F.2.1.4 Divide unit fractions by whole numbers and whole numbers by unit fractions.

M05.C-G.2.1.1 Classify two-dimensional figures in a hierarchy based on properties. *Example 1: All polygons have at least 3 sides and pentagons are polygons, so all pentagons have at least 3 sides. Example 2: A rectangle is a parallelogram, which is a quadrilateral, which is a polygon; so, a rectangle can be classified as a parallelogram, as a quadrilateral, and as a polygon.*

Common Core State Standards

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.NF.1 Add and subtract fractions 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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. **a.** Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.) **b.** Find the area of a rectangle with fractional 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. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NF.5. Interpret multiplication as scaling (resizing), by: **a.** Comparing 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. **b**. Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1.

5.NF.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

5.NF.7. Apply and extend previous understandings of division
to divide unit fractions by whole numbers and whole numbers by unit fractions.1
a. Interpret division of a unit fraction by a non-zero whole number, and
compute such quotients. *For example, create a story context for (1/3) ÷ 4,
and use a visual fraction model to show the quotient. Use the relationship
between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because
(1/12) × 4 = 1/3.* **b**. Interpret division of a whole number by a unit
fraction, and compute such quotients. *For example, create a story context
for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the
relationship between multiplication and division to explain that 4 ÷ (1/5) = 20
because 20 × (1/5) = 4.* **c**. Solve real world problems involving
division of unit fractions by non-zero whole numbers and division of whole
numbers by unit fractions, e.g., by using visual fraction models and equations
to represent the problem. *For example, how much chocolate will each person
get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings
are in 2 cups of raisins?*

5.G.3. Understand that attributes belonging to a category of
two-dimensional figures also belong to all subcategories of that category. For
example, all rectangles have four right angles and squares are rectangles, so
all squares have four right angles.

5.G.4. Classify two-dimensional figures in a hierarchy based
on properties.

Vocabulary

area model, discount, horizontal, Quick Common Denominator (QCD), unit fraction, unit percent
vertical

Assessment(s)

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Progress Check 8 (Unit 8 Test)

Duration

16 Days

- Units

Unit 9 - Coordinates, Area, Volume, and Capacity

Concepts

Coordinates, Coordinate Graphs, Areas of Rectangles, Rectangle Method for Finding Area,
Formulas for the Ares of Triangles and Parallelograms, Volume of Rectangular Prisms, Volume of
Right Prisms, Capacity: Liter, Milliliter, and Cubic Centimeter

PA Common Core Standards

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.B.2 Extend an understanding of operations with whole numbers to perform operations including decimals.

2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.

2.1.5.C.2 Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

2.4.5.A.1 Solve problems using conversions within a given measurement system.

2.4.5.A.5 Apply concepts of volume to solve problems and relate volume to multiplication and to addition.

2.3.5.A.1 Graph points in the first quadrant on the coordinate plane and interpret these points when solving real world and mathematical problems.

PA Eligible Content

M05.A-T.1.1.2 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. Use whole-number exponents to denote powers of 10. *Example 1: 4 × 102 = 400 Example 2: 0.05 ÷ 103 = 0.00005*

M05.A-T.1.1.5 Round decimals to any place (limit rounding to ones, tenths, hundredths, or thousandths place).

M05.A-T.2.1.1 Multiply multi-digit whole numbers (not to exceed 3-digit by 3-digit).

M05.A-T.2.1.3 Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.1.1.1 Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) *Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*

M05.A-F.2.1.2 Multiply a fraction (including mixed numbers) by a fraction.

M05.A-F.2.1.4 Divide unit fractions by whole numbers and whole numbers by unit fractions.

M05.D-M.1.1.1 Convert among different-sized measurement units within a given measurement system. **A table of equivalencies will be provided.** *Example: Convert 5 cm to meters.*

M05.D-M.3.1.1 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. **The formulas will be provided.**

M05.D-M.3.1.2 Find volumes of solid figures composed of two nonoverlapping right rectangular prisms.

M05.C-G.1.1.1 Identify parts of the coordinate plane (x-axis, y-axis, and the origin) and the ordered pair (x-coordinate and y-coordinate). Limit the coordinate plane to quadrant I.

M05.C-G.1.1.2 Represent real-world and mathematical problems by plotting points in quadrant I of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Common Core State Standards

5.NBT.2. 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. Use whole-number exponents to denote powers of 10.

5.NBT.4. Use place value understanding to round decimals to any place.

5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. **a.** Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)

b. Find the area of a rectangle with fractional 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. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NF.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.1

a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.* **b**. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* **c**. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

5.MD.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. **a.** 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. **b.** 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.

5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. **a.** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. **b.** 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. **c.** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

5.G.1 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. Understand that 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).

5.G.2.
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.

Vocabulary

altitude, area, Associative Property of Multiplication, axes, base, base (of a rectangular prism), capacity, coordinate, coordiante grid, cubic centimeter, cubic unit, cup (c), face, formula, height, height (of a rectangular prism), horizontal axis, latitude, liter (L), longitude, milliter (mL), opposite of a number, ordered number pair, ordered pair of numbers, origin perpendicular, persoanl refernces, prism, quart (qt), rectangle method, rectangular prism, reflection, square units, translation, variable, bertical axis, volume, volume (of a container)

Assessment(s)

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Progress Check 9 (Unit 9 Test)

Duration

14 Days

- Units

Unit 10 - Using Data; Algrebra Concepts and Skills

Concepts

Pan-Balance Problems, Algebraic Expressions, Rules, Tables, and Graphs, Reading Graphs, Circumference of a Circle, Area of a Circle

PA Common Core Standards

2.2.5.A.1 Interpret
and evaluate numerical expressions using order of operations.

2.2.5.A.4 Analyze
patterns and relationships using two rules.

2.1.5.B.1 Apply
place value concepts to show an understanding of operations and rounding as
they pertain to whole numbers and decimals.

2.1.5.B.2 Extend
an understanding of operations with whole numbers to perform operations
including decimals.

2.1.5.C.1 Use
the understanding of equivalency to add and subtract fractions.

2.1.5.C.2 Apply
and extend previous understandings of Multiplication and division to multiply
and divide fractions.

2.4.5.A.1 Solve
problems using conversions within a given measurement system.

2.4.5.A.4 Solve
problems involving computation of fractions using information provided in a
line plot.

2.4.5.A.5 Apply
concepts of volume to solve problems and relate volume to multiplication and to
addition.

2.3.5.A.1 Graph
points in the first quadrant on the coordinate plane and interpret these points
when solving real world and mathematical problems.

PA Eligible Content

M05.B-O.1.1.1
Use multiple grouping symbols (parentheses, brackets, or braces)
in numerical expressions, and evaluate expressions containing these symbols.

M05.B-O.1.1.2
Write simple expressions that model calculations with numbers, and
interpret numerical expressions without evaluating them. *Example 1: Express
the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Example 2:
Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921,
without having to calculate the indicated sum or product.*

M05.B-O.2.1.1
Generate two numerical patterns using two given rules. *Example:
Given the rule "Add 3" and the starting number 0, and given the rule "Add 6"
and the starting number 0, generate terms in the resulting sequences.*

M05.B-O.2.1.2
Identify apparent relationships between corresponding terms of two
patterns with the same starting numbers that follow different rules. *Example: Given two patterns in
which the first pattern follows the rule "add 8" and the second pattern follows the rule "add 2",
observe that the terms in the first pattern are 4 times the size of the terms in the second pattern.*

M05.A-T.1.1.2
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. Use
whole-number exponents to denote powers of 10. *Example 1: 4 × 102 = 400
Example 2: 0.05 ÷ 103 = 0.00005*

M05.A-T.1.1.5
Round decimals to any place (limit rounding to ones, tenths,
hundredths, or thousandths place).

M05.A-T.2.1.1
Multiply multi-digit whole numbers (not to exceed 3-digit by
3-digit).

M05.A-T.2.1.3
Add, subtract, multiply, and divide decimals to hundredths (no divisors with decimals).

M05.A-F.1.1.1
Add and subtract fractions (including mixed numbers) with unlike denominators. (May include multiple methods and representations.) *Example: 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*

M05.A-F.2.1.3
Demonstrate an understanding of multiplication as scaling (resizing). *Example 1: Comparing 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. Example 2: Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.*

M05.D-M.1.1.1
Convert among different-sized measurement units within a given measurement system. **A table of equivalencies will be provided.** *Example: Convert 5 cm to meters.*

M05.D-M.2.1.1
Solve problems involving computation of fractions by using information presented in line plots.

M05.D-M.3.1.1
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. **The formulas will be provided.**

M05.C-G.1.1.1
Identify parts of the coordinate plane (x-axis, y-axis, and the origin) and the ordered pair (x-coordinate and y-coordinate). Limit the coordinate plane to quadrant I.

M05.C-G.1.1.2
Represent real-world and mathematical problems by plotting points in quadrant I of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Common Core State Standards

5.OA.1
Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2.
Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example,*

express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

5.OA.3
Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

5.NBT.2.
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. Use whole-number exponents to denote powers of 10.

5.NBT.4.
Use place value understanding to round decimals to any place.

5.NBT.5.
Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.7.
Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

5.NF.2.
Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.5.
Interpret multiplication as scaling (resizing), by: **a.** Comparing 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.

5.MD.1
Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

5.MD.2
Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For*

example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

5.MD.3.
Recognize volume as an attribute of solid figures and understand concepts of volume measurement. **a.** 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. **b.** 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.

5.MD.4.
Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD5.
Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. **a.** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. **b.** 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.

5.G.1
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. Understand that 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).

5.G.2.
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.

Vocabulary

allgebraic expression, circumference, coordinates, diameter, formula, geyser, line graph, mystery graph, ordreed number pairs, pan balance, pi, predict, radius, rate, ration, ration comparison, variable,

Assessment(s)

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Progress Check 10 (Unit 10 Test)

Duration

13 Days

- Units

Unit 11 - Volume

Concepts

Review of Geometric Solids, Volume of Cylinders, Volume of Pyramids and Cones, Finding Volume by a Displacement Method, Capacity and Weight, Surface Area

PA Common Core Standards

2.2.5.A.1 Interpret and evaluate numerical expressions using order of operations.

2.1.5.B.1 Apply place value concepts to show an understanding of operations and rounding as they pertain to whole numbers and decimals.

2.1.5.C.1 Use the understanding of equivalency to add and subtract fractions.

2.4.5.A.1 Solve problems using conversions within a given measurement system.

2.4.5.A.4 Solve problems involving computation of fractions using information provided in a line plot.

2.4.5.A.5 Apply concepts of volume to solve problems and relate volume to multiplication and to addition.

PA Eligible Content

M05.B-O.1.1.1
Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions, and evaluate expressions containing these symbols.

M05.A-T.1.1.2
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. Use

whole-number exponents to denote powers of 10. *Example 1: $4 \times 10^2 = 400$*
Example 2: $0.05 \div 10^3 = 0.00005$

M05.A-T.1.1.5
Round decimals to any place (limit rounding to ones, tenths,
hundredths, or thousandths place).

M05.A-F.1.1.1
Add and subtract fractions (including mixed numbers) with unlike
denominators. (May include multiple methods and representations.) *Example:*
$2/3 + 5/4 = 8/12 + 15/12 = 23/12$.

M05.A-F.2.1.4
Divide unit fractions by whole numbers and whole numbers by unit
fractions.

M05.D-M.1.1.1
Convert among different-sized measurement units within a given
measurement system. **A table of equivalencies will be provided.** *Example:*
Convert 5 cm to meters.

M05.D-M.2.1.1
Solve problems involving computation of fractions by using
information presented in line plots.

M05.D-M.3.1.1
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. **The formulas will be provided.**

M05.D-M.3.1.2
Find volumes of solid figures composed of two nonoverlapping right rectangular
prisms.

Common Core State Standards

5.OA.1
Use parentheses, brackets, or braces in numerical expressions, and
evaluate expressions with these symbols.

5.NBT.2.
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. Use
whole-number exponents to denote powers of 10.

5.NBT.4.
Use place value understanding to round decimals to any place.

5.NF.1
Add and subtract fractions 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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general,
a/b + c/d = (ad + bc)/bd.)*

5.NF.2.
Solve word problems involving addition and subtraction of
fractions referring to the same whole, including cases of unlike denominators,
e.g., by using visual fraction models or equations to represent the problem.
Use benchmark fractions and number sense of fractions to estimate mentally and
assess the reasonableness of answers. *For example, recognize an incorrect
result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

5.NF.4. Apply and extend previous understandings of
multiplication to multiply a fraction or whole number by a fraction. **b.** Find
the area of a rectangle with fractional 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. Multiply
fractional side lengths to find areas of rectangles, and represent fraction
products as rectangular areas.

5.NF.7.
Apply and extend previous understandings of division to divide
unit fractions by whole numbers and whole numbers by unit fractions.1 **a.** Interpret
division of a unit fraction by a non-zero whole number, and compute such
quotients. *For example, create a story context for (1/3) ÷ 4, and use a
visual fraction model to show the quotient. Use the relationship between
multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4
= 1/3.* **b**. Interpret division of a whole number by a unit fraction,
and compute such quotients. *For example, create a story context for 4 ÷
(1/5), and use a visual fraction model to show the quotient. Use the
relationship between multiplication and division to explain that 4 ÷ (1/5) = 20
because 20 × (1/5) = 4.* **c**. Solve real world problems involving
division of unit fractions by non-zero whole numbers and division of whole
numbers by unit fractions, e.g., by using visual fraction models and equations
to represent the problem. *For example, how much chocolate will each person
get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings
are in 2 cups of raisins?*

5.MD.1
Convert among different-sized standard measurement units within a
given measurement system (e.g., convert 5 cm to 0.05 m), and use these
conversions in solving multi-step, real world problems.

5.MD.2
Make a line plot to display a data set of measurements in
fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade
to solve problems involving information presented in line plots. *For
example, given different measurements of liquid in identical beakers, find the
amount of liquid each beaker would contain if the total amount in all the
beakers were redistributed equally.*

5.MD.3.
Recognize volume as an attribute of solid figures and understand
concepts of volume measurement. **a.** 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. **b.** 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.

5.MD.4.
Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD5.
Relate
volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. **a.** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. **b.** 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. **c.** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Vocabulary

apex, base, calibrate, cone cylinder, displacement, edge, face, geometric, solid, polyhedron, prism, pyramid, regular polyhedron, sphere, surface, surface area, vertex (vertices or vertexes)

Assessment(s)

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Progress Check 11 (Unit 11 Test)

Duration

11 Days

- Units

Unit 12 - Probability, Ratios, and Rates

Concepts

Factor Trees, Choices, Tree Diagrams, and Probability, Ratios of Parts to Wholes, Number Models for Ratio Number Stories, Collecting, Graphing and Interpreting Data, Calculating Rates from Data

PA Common Core Standards

2.1.5.B.1 Apply
place value concepts to show an understanding of operations and rounding as
they pertain to whole numbers and decimals.

2.1.5.B.2 Extend
an understanding of operations with whole numbers to perform operations
including decimals.

2.3.5.A.1 Graph
points in the first quadrant on the coordinate plane and interpret these points
when solving real world and mathematical problems.

PA Eligible Content

M05.A-T.1.1.5
Round decimals to any place (limit rounding to ones, tenths,
hundredths, or thousandths place).

M05.A-T.2.1.3
Add, subtract, multiply, and divide decimals to hundredths (no
divisors with decimals).

M05.A-F.2.1.4
Divide unit fractions by whole numbers and whole numbers by unit
fractions.

M05.C-G.1.1.1
Identify parts of the coordinate plane (x-axis, y-axis,
and the origin) and the ordered pair (x-coordinate and y-coordinate).
Limit the coordinate plane to quadrant I.

Common Core State Standards

5.NBT.4.
Use place value understanding to round decimals to any place.

5.NBT.7.
Add, subtract, multiply, and divide decimals to hundredths, using
concrete models or drawings and strategies based on place value, properties of
operations, and/or the relationship between addition and subtraction; relate
the strategy to a written method and explain the reasoning used.

5.NF.7.
Apply and extend previous understandings of division to divide
unit fractions by whole numbers and whole numbers by unit fractions.1 **a.** Interpret
division of a unit fraction by a non-zero whole number, and compute such
quotients. *For example, create a story context for (1/3) ÷ 4, and use a
visual fraction model to show the quotient. Use the relationship between
multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4
= 1/3.* **b.** Interpret division of a whole number by a unit fraction, and
compute such quotients. *For example, create a story context for 4 ÷ (1/5),
and use a visual fraction model to show the quotient. Use the relationship
between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 ×*

(1/5) = 4. **c**. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

5.G.1
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. Understand that 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).

Vocabulary

carvon dioxide, cardiac output, common factor, equally likely, factor tree, greatest common factor, heart rate, least common multiple, magnitude, Multiplication Counting Principle, nutrients, oxygen, prime factorization, probability, profile, pulse, pulse rate, rate, ration, ratio comparison, target heart rate, tree diagram.

Assessment(s)

End of the Year Assessment

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Progress Check 12 (Unit 12 Test)

Duration

12 Days

Mathematics: Standards for Mathematical Practice

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 and 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.