

Young Scholars of Western Pennsylvania Charter School

3rd Mathematics YSWPCS

- Units

Unit 1: Routines, Review, and Assessment

Concepts

Numbers and Number Sequences; number grids, introducing the student reference book, tools for mathematics, analyzing and displaying data; equivalent names, the language of chance events, finding differences, calculator routines, money, solving problems with dollars and cents; and the length-of-day project.

PA Common Core Standards

2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.

2.1.3.B.1 Apply place value understanding and properties of operations to perform multi-digit arithmetic.

2.4.3.A.2 Tell and write time to the nearest minute and solve problems by calculating time intervals.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

PA Eligible Content

M03.B-O.3.1.5 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. *Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.*

M03.A-T.1.1.1 Round two- and three-digit whole numbers to the nearest ten or hundred, respectively.

M03.A-T.1.1.2 Add two- and three-digit whole numbers (limit sums from 100 through 1,000), and subtract two- and three-digit numbers from three-digit whole numbers.

M03.D-M.1.1.1 Tell, show, and/or write time (analog) to the nearest minute.

M03.D-M.1.1.2 Calculate the elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).

M03.D-M.2.1.1 Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).

M03.D-M.2.1.2 Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). *Example 1: (One-step) “Which category is the largest?” Example 2: (Two-step) “How many more is in category A than in category B?”*

M03.D-M.2.1.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.

Common Core State Standards

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.MD.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step —how many more and —how many less problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Vocabulary

Number and Numeration, Operations and Computation, Data and Chance, Geometry, Measurement, Reference Frames,

Patterns, Functions, and Algebra

Assessment(s)

Daily Assessments, pg. 8

Unit 1 Test

Duration

17 Days

- Units

Unit 2: Adding and Subtracting Whole Numbers

Concepts

Fact families, extensions of addition and subtraction facts, "What's My Rule?," Parts-and-Total Number Stories, Change Number Stories, Comparison Number Stories, The Partial-Sums Algorithm, subtractions algorithms, addition with three or more addends.

PA Common Core Standards

2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.

2.1.3.B.1 Apply place value understanding and properties of operations to perform multi-digit arithmetic.

PA Eligible Content

M03.B-O.3.1.1 Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers.

M03.B-O.3.1.2 Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.

M03.B-O.3.1.5 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. *Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.*

M03.A-T.1.1.1 Round two- and three-digit whole numbers to the nearest ten or hundred, respectively.

M03.A-T.1.1.2 Add two- and three-digit whole numbers (limit sums from 100 through 1,000), and subtract two- and three-digit numbers from three-digit whole numbers.

Common Core State Standards

3.OA.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Vocabulary

Ballpark estimate, fact family, fact triangle, function machine, "What's My Rule?" Problems, Number Family, Number Model, Parts-and-Total Diagram, Change Diagram, Comparison Diagram, Unit Box.

Assessment(s)

Daily Assessments, pg. 94

Unit 2 Test

Duration

13 Days

- Units

Unit 3: Linear Measures and Area

Concepts

"A Class Shoe" Unit of Length, measuring with a ruler, standard linear measures, perimeter, a pattern-block toss experiment, exploring perimeter and area, area, number models for area, diameter and circumference.

PA Common Core Standards

2.2.3.A.1 Represent and solve problems involving multiplication and division.

2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division.

2.1.3.B.1 Apply place value understanding and properties of operations to perform multi-digit arithmetic.

2.1.3.C.1 Explore and develop an understanding of fractions as numbers.

2.4.3.A.2 Tell and write time to the nearest minute and solve problems by calculating time intervals.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.

2.4.3.A.5 Determine the area of a rectangle and apply the concept to multiplication and to addition.

2.3.3.A.1 Identify, compare, and classify shapes and their attributes.

PA Eligible Content

M03.B-O.1.2.1 Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.B-O.2.1.1 Apply the commutative property of multiplication (not identification or definition of the property).

M03.B-O.2.1.2 Apply the associative property of multiplication (not identification or definition of the property).

M03.B-O.3.1.5 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. *Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.*

M03.A-T.1.1.2 Add two- and three-digit whole numbers (limit sums from 100 through 1,000), and subtract two- and three-digit numbers from three-digit whole numbers.

M03.A-F.1.1.2 Represent fractions on a number line diagram (limit the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).

M03.A-F.1.1.3 Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator). *Example 1: $1/2 = 2/4$; Example 2: $4/6 = 2/3$*

M03.D-M.1.1.1 Tell, show, and/or write time (analog) to the nearest minute.

M03.D-M.1.1.2 Calculate the elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).

M03.D-M.2.1.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.

M03.D-M.3.1.1 Measure areas by counting unit squares (square cm, square m, square in., square ft, and non-standard square units).

M03.D-M.3.1.2 Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

M03.D-M.4.1.1 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.

M03.C-G.1.1.1 Explain that shapes in different categories may share attributes, and that the shared attributes can define a larger category. *Example 1: A rhombus and a rectangle are both quadrilaterals since they both have exactly four sides. Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures.*

M03.C-G.1.1.2 Recognize rhombi, rectangles, and squares as examples of quadrilaterals, and/or draw examples of quadrilaterals that do not belong to any of these subcategories.

Common Core State Standards

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.5. Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

3.NBT.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. **a.** Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. **b.** Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **a.** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

3.MD.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

3.MD.5. Recognize area as an attribute of plane figures and understand concepts of area measurement. **a.** A square with side length 1 unit, called —a unit square, is said to have —one square unit of area, and can be used to measure area. **b.** A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

3.MD.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

3.MD.7. Relate area to the operations of multiplication and addition. **b.** Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

3.MD.7. Relate area to the operations of multiplication and addition. **a.** Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

3.G.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Vocabulary

unit

length

U.S. customary system

metric system of measurement

benchmark

perimeter

Circumference

diameter

polygon

tiling

area

square unit

Assessment(s)

Daily Assessment, pg. 162

Unit 3 Test

Duration

13 Days

- ## Units

Unit 4: Multiplication and Division

Concepts

Multiples of equal groups, multiplication arrays, equal shares and equal groups; division ties to multiplication, multiplication fact power and shortcuts; multiplication and division fact families; baseball multiplication; exploring arrays and facts; estimating distances with a map scale, and a coin-toss.

PA Common Core Standards

2.2.3.A.1 Represent and solve problems involving multiplication and division.

2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division.

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.1.3.B.1 Apply place value understanding and properties of operations to perform multi-digit arithmetic.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

2.4.3.A.5 Determine the area of a rectangle and apply the concept to multiplication and to addition.

2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.

PA Eligible Content

M03.B-O.1.1.1 Interpret and/or describe products of whole numbers (up to and including 10×10). *Example 1: Interpret 35 as the total number of objects in 5 groups, each containing 7 objects. Example 2: Describe a context in which a total number of objects can be expressed as 5×7 .*

M03.B-O.1.1.2 Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50, and limit divisors and quotients through 10). *Example 1: Interpret $48 \div 8$ as the number of objects in each share when 48 objects are partitioned equally into 8 shares, or as a number of shares when 48 objects are partitioned into equal shares of 8 objects each. Example 2: Describe a context in which a number of shares or a number of groups can be expressed as $48 \div 8$.*

M03.B-O.1.2.1 Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.B-O.1.2.2 Determine the unknown whole number in a multiplication (up to and including 10×10) or division (limit dividends through 50, and limit divisors and quotients through 10) equation relating three whole numbers. *Example: Determine the unknown number that makes an equation true.*

M03.B-O.2.1.1 Apply the commutative property of multiplication (not identification or definition of the property).

M03.B-O.2.1.2 Apply the associative property of multiplication (not identification or definition of the property).

M03.B-O.2.2.1 Interpret and/or model division as a multiplication equation with an unknown-factor. *Example: Find $32 \div 8$ by solving $8 \times ? = 32$.*

M03.B-O.3.1.5 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. *Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.*

M03.A-T.1.1.2 Add two- and three-digit whole numbers (limit sums from 100 through 1,000), and subtract two- and three-digit numbers from three-digit whole numbers.

M03.D-M.2.1.1 Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).

M03.D-M.2.1.2 Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). *Example 1: (One-step) "Which category is the largest?" Example 2: (Two-step) "How many more is in category A than in category B?"*

M03.D-M.3.1.1 Measure areas by counting unit squares (square cm, square m, square in., square ft, and non-standard square units).

M03.D-M.3.1.2 Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

M03.D-M.4.1.1 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.

Common Core State Standards

3.OA.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .

3.OA.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

3.OA.5. Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.OA.6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

3.NBT.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step —how many more and —how many less problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

3.MD.7. Relate area to the operations of multiplication and addition. **b.** Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

3.MD.7. Relate area to the operations of multiplication and addition. **a.** Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Vocabulary

multiples of a number

multiplication/division diagram

rectangular array

factor

product

equal groups

dividend

divisor

quotient

remainder

square number

Assessment(s)

Daily Assessments, pg. 234

Unit 4 Test

Duration

14 Days

- Units

Unit 5: Place Value in Whole Numbers and Decimals

Concepts

Place Value through ten-thousands, reading, writing, and ordering numbers; place value to millions, application: The US Census, very large numbers, exploring estimates and polygons; model decimals with base-10 blocks, tenths and hundredths; tenths and hundredths of a meter; application: rainfall, place value in decimals, sunrise-sunset line graphs.

PA Common Core Standards

2.2.3.A.1 Represent and solve problems involving multiplication and division.

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.1.3.C.1 Explore and develop an understanding of fractions as numbers.

2.4.3.A.2 Tell and write time to the nearest minute and solve problems by calculating time intervals.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.

PA Eligible Content

M03.B-O.1.2.1 Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.A-F.1.1.1 Demonstrate that when a whole or set is partitioned into y equal parts, the fraction $1/y$ represents 1 part of the whole and the fraction x/y represents x equal parts of the whole (limit the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).

M03.D-M.1.1.1 Tell, show, and/or write time (analog) to the nearest minute.

M03.D-M.1.1.2 Calculate the elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).

M03.D-M.2.1.1 Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).

M03.D-M.2.1.2 Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). *Example 1: (One-step) "Which category is the largest?" Example 2: (Two-step) "How many more is in category A than in category B?"*

M03.D-M.2.1.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.

M03.D-M.4.1.1 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.

Common Core State Standards

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.NF.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.

3.MD.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step —how many more and —how many less problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

3.MD.7. Relate area to the operations of multiplication and addition **d.** Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Vocabulary

place Value

maximum

millimeter

pie graph

line graph

Assessment(s)

Daily Assessments, pg. 310

Unit 5 Test

Duration

16 Days

- Units

Unit 6: Geometry

Concepts

Investigating line segments, rays, and lines; angles and turns; triangles, quadrangles, polygons, drawing angles, measuring angles, symmetry, exploring congruence, line segments, and decimals; polyhedrons, part 1 and part 2.

PA Common Core Standards

2.2.3.A.1 Represent and solve problems involving multiplication and division.

2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division.

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.

2.3.3.A.1 Identify, compare, and classify shapes and their attributes.

PA Eligible Content

M03.B-O.1.2.1 Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.B-O.2.1.1 Apply the commutative property of multiplication (not identification or definition of the property).

M03.B-O.2.1.2 Apply the associative property of multiplication (not identification or definition of the property).

M03.D-M.4.1.1 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.

M03.C-G.1.1.1 Explain that shapes in different categories may share attributes, and that the shared attributes can define a larger category. *Example 1: A rhombus and a rectangle are both quadrilaterals since they both have exactly four sides. Example 2: A triangle and a pentagon are both polygons since they are both multi-sided plane figures.*

M03.C-G.1.1.2 Recognize rhombi, rectangles, and squares as examples of quadrilaterals, and/or draw examples of quadrilaterals that do not belong to any of these subcategories.

Common Core State Standards

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.5. Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.MD.7. Relate area to the operations of multiplication and addition. **d.** Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

3.G.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Vocabulary

2-dimensional (2-D) shape

3-dimensional (3-D) shape

base of a 3-D shape

cone

sphere

cylinder

parallel

face

polyhedron

prism

pyramid

Assessment(s)

Daily Assessments, pg. 394

Unit 6 Test

Duration

16 Days

- Units

Unit 7: Multiplication and Division

Concepts

Patterns in products, multiplication facts survey, fact power, number models with parentheses, scoring in basketball: an application, extended facts: multiplication and division; estimating costs, extended facts: products of tens, exploring ratios and geometric figures.

PA Common Core Standards

2.2.3.A.1 Represent and solve problems involving multiplication and division.

2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division.

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.

2.1.3.B.1 Apply place value understanding and properties of operations to perform multi-digit arithmetic.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

PA Eligible Content

M03.B-O.1.1.2 Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50, and limit divisors and quotients through 10). *Example 1: Interpret $48 \div 8$ as the number of objects in each share when 48 objects are partitioned equally into 8 shares, or as a number of shares when 48 objects are partitioned into equal shares of 8 objects each.*

Example 2: Describe a context in which a number of shares or a number of groups can be expressed as $48 \div 8$.

M03.B-O.1.2.1 Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.B-O.1.2.2 Determine the unknown whole number in a multiplication (up to and including 10×10) or division (limit dividends through 50, and limit divisors and quotients through 10) equation relating three whole numbers.
Example: Determine the unknown number that makes an equation true.

M03.B-O.2.1.1 Apply the commutative property of multiplication (not identification or definition of the property).

M03.B-O.2.1.2 Apply the associative property of multiplication (not identification or definition of the property).

M03.B-O.2.2.1 Interpret and/or model division as a multiplication equation with an unknown-factor. *Example: Find $32 \div 8$ by solving $8 \times ? = 32$.*

M03.B-O.3.1.1 Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers and having whole-number answers.

M03.B-O.3.1.2 Represent two-step word problems using equations with a symbol standing for the unknown quantity. Limit to problems with whole numbers and having whole-number answers.

M03.B-O.3.1.5 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and/or explain them using properties of operations. *Example 1: Observe that 4 times a number is always even. Example 2: Explain why 6 times a number can be decomposed into three equal addends.*

M03.A-T.1.1.1 Round two- and three-digit whole numbers to the nearest ten or hundred, respectively.

M03.A-T.1.1.2 Add two- and three-digit whole numbers (limit sums from 100 through 1,000), and subtract two- and three-digit numbers from three-digit whole numbers.

M03.A-T.1.1.3 Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).

M03.D-M.2.1.1 Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).

M03.D-M.2.1.2 Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). *Example 1: (One-step) "Which category is the largest?" Example 2: (Two-step) "How many more is in category A than in category B?"*

Common Core State Standards

3.OA.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects

are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

3.OA.5. Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.OA.6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.NBT.3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step —how many more— and —how many less— problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

estimate, extended facts, factor, parentheses, product, similar figures, square number, and square product.

Assessment(s)

Daily Assessments: TM p. 568

Core Assessments and Progress Check: TM p. 569

Duration

13 Days

- Units

Unit 8: Fractions

Concepts

Naming parts with fractions, blocks-in-a-bag experiment, exploring fractions, re-forming squares, and combinations; number-line posters for fractions; equivalent fractions, comparing fractions, fractions greater than ONE, fractions in number stories.

PA Common Core Standards

2.2.3.A.1

Represent and solve problems involving multiplication and division.

2.2.3.A.2

Understand properties of multiplication and the relationship between multiplication and division.

2.1.3.C.1

Explore and develop an understanding of fractions as numbers.

2.1.3.C.1

Explore and develop an understanding of fractions as numbers.

2.1.3.C.1 Explore and develop an understanding of fractions as numbers.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

2.3.3.A.2 Use the understanding of fractions to partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole.

PA Eligible Content

M03.B-O.1.2.1

Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.B-O.2.1.1

Apply the commutative property of multiplication (not identification or definition of the property).

M03.B-O.2.1.2

Apply the associative property of multiplication (not identification or definition of the property).

M03.A-F.1.1.1

Demonstrate that when a whole or set is partitioned into y equal parts, the fraction $1/y$ represents 1 part of the whole and the fraction x/y represents x equal parts of the whole (limit the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).

M03.A-F.1.1.2

Represent fractions on a number line diagram (limit the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).

M03.A-F.1.1.4

Express whole numbers as fractions, and generate fractions that

are equivalent to whole numbers (limit the denominators to 1, 2, 3, 4, 6, and 8). *Example 1: Express 3 in the form $3 = 3/1$ Example 2: Recognize that $6/1 = 6$*

M03.A-F.1.1.3 Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator). *Example 1: $1/2 = 2/4$; Example 2: $4/6 = 2/3$*

M03.A-F.1.1.4 Express whole numbers as fractions, and generate fractions that are equivalent to whole numbers (limit the denominators to 1, 2, 3, 4, 6, and 8). *Example 1: Express 3 in the form $3 = 3/1$ Example 2: Recognize that $6/1 = 6$*

M03.A-F.1.1.5 Compare two fractions with the same denominator (limit the denominators to 1, 2, 3, 4, 6, and 8), using the symbols $>$, $=$, or $<$, and/or justify the conclusions.

M03.D-M.2.1.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.

M03.C-G.1.1.3 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *Example 1: Partition a shape into 4 parts with equal areas. Example 2: Describe the area of each of 8 equal parts as $1/8$ of the area of the shape.*

Common Core State Standards

3.OA.3.

Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.5.

Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.NF.1.

Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.

3.NF.2.

Understand a fraction as a number on the number line; represent fractions on a number line diagram. **a.** Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. **b.** Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

3.NF.3.

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **c.** Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.*

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **a.** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

b. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **c.** Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.*

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **d.** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

3.G.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a

shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.

Vocabulary

denominator, equal, equivalent fractions, mixed number, numerator, random draw, unit fraction, whole (the ONE)

Assessment(s)

Daily Assessments: TM p. 640

Core Assessments and Progress Check: TM p. 641

Duration

12 Days

- Units

Unit 9: Multiplication and Division

Concepts

Multiply and divide with multiplies of 10, 100, and 1,000; using mental math to multiply, exploring arrays, areas, and fractions; a multiplication algorithm, buying at the stock-up sale: application, factors of a whole number, sharing money, broken-calculator division, lattice multiplication, exploring arrays, equilateral triangles, and strength of paper; products of 2-digit numbers part 1 and 2; positive and negative numbers.

PA Common Core Standards

2.2.3.A.1 Represent and solve problems involving multiplication and division.

2.2.3.A.2 Understand properties of multiplication and the relationship between multiplication and division.

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.

2.1.3.B.1

Apply place value understanding and properties of operations to perform multi-digit arithmetic.

2.1.3.C.1

Explore and develop an understanding of fractions as numbers.

2.4.3.A.1

Solve problems involving measurement and estimation of temperature, liquid volume, mass or length.

2.4.3.A.4

Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

2.4.3.A.6

Solve problems involving perimeters of polygons and distinguish between linear and area measures.

2.4.3.A.5

Determine the area of a rectangle and apply the concept to multiplication and to addition.

PA Eligible Content

M03.B-O.1.1.1 Interpret and/or describe products of whole numbers (up to and including 10×10). *Example 1: Interpret 35 as the total number of objects in 5 groups, each containing 7 objects. Example 2: Describe a context in which a total number of objects can be expressed as 5×7 .*

M03.B-O.1.1.2 Interpret and/or describe whole-number quotients of whole numbers (limit dividends through 50, and limit divisors and quotients through 10). *Example 1: Interpret $48 \div 8$ as the number of objects in each share when 48 objects are partitioned equally into 8 shares, or as a number of shares when 48 objects are partitioned into equal shares of 8 objects each. Example 2: Describe a context in which a number of shares or a number of groups can be expressed as $48 \div 8$.*

M03.B-O.1.2.1 Use multiplication (up to and including 10×10) and/or division (limit dividends through 50, and limit divisors and quotients through 10) to solve word problems in situations involving equal groups, arrays, and/or measurement quantities.

M03.B-O.2.1.1 Apply the commutative property of multiplication (not identification or definition of the property).

M03.B-O.2.1.2 Apply the associative property of multiplication (not identification or definition of the property).

M03.B-O.2.2.1 Interpret and/or model division as a multiplication equation with an unknown-factor. *Example: Find $32 \div 8$ by solving $8 \times ? = 32$.*

M03.B-O.3.1.1 Solve two-step word problems using the four operations (expressions are not explicitly stated). Limit to problems with whole numbers

and having whole-number answers.

M03.B-O.3.1.2 Represent two-step word problems using equations with a symbol standing for the unknown **M03.A-T.1.1.3** Multiply one-digit whole numbers by two-digit multiples of 10 (from 10 through 90).

quantity. Limit to problems with whole numbers and having whole-number answers.

M03.A-F.1.1.5

Compare two fractions with the same denominator (limit the denominators to 1, 2, 3, 4, 6, and 8), using the symbols $>$, $=$, or $<$, and/or justify the conclusions.

M03.D-M.1.2.1

Measure and estimate liquid volumes and masses of objects using standard units (cups [c], pints [pt], quarts [qt], gallons [gal], ounces [oz.], and pounds [lb]) and metric units (liters [l], grams [g], and kilograms [kg]).

M03.D-M.1.2.2

Add, subtract, multiply, and divide to solve one-step word problems involving masses or liquid volumes that are given in the same units.

M03.D-M.2.1.3

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.

M03.D-M.3.1.1

Measure areas by counting unit squares (square cm, square m, square in., square ft, and non-standard square units).

M03.D-M.4.1.1

Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas, and exhibiting rectangles with the same area and different perimeters. Use the same units throughout the problem.

Common Core State Standards

3.OA.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .

3.OA.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*

3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.5. Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.OA.6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.NBT.3.

Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

3.NF.3.

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **d.** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

3.MD.2.

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.MD.4.

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

3.MD.5.

Recognize area as an attribute of plane figures and understand concepts of area measurement. **a.** A square with side length 1 unit, called

—a unit square, is said to have —one square unit of area, and can be used to measure area. **b.** A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

3.MD.6.

Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

3.MD.7.

Relate area to the operations of multiplication and addition. **a.** Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. **c.** Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.

3.MD.8.

Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Vocabulary

algorithm, Celsius scale, degrees Celsius, degrees Fahrenheit, equilateral triangle, factors, Fahrenheit scale, lattice multiplication, partial-products algorithm.

Assessment(s)

Daily Assessments: TM p. 704

Common Assessments and Progress Check: TM. p. 705

Duration

17 Days

Units

Unit 10: Measurement and Data

Concepts

Review: Length, volume, weight, exploring weight and volume; capacity, the mean and the median; calculating the mean, calculator distributions, coordinate grids.

PA Common Core Standards

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.1.3.C.1 Explore and develop an understanding of fractions as numbers.

2.4.3.A.1 Solve problems involving measurement and estimation of temperature, liquid volume, mass or length.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

2.4.3.A.6 Solve problems involving perimeters of polygons and distinguish between linear and area measures.

PA Eligible Content

M03.A-F.1.1.2 Represent fractions on a number line diagram (limit the denominators to 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator; no simplification necessary).

M03.A-F.1.1.3 Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8; limit numerators to whole numbers less than the denominator). *Example 1: $1/2 = 2/4$; Example 2: $4/6 = 2/3$*

M03.A-F.1.1.5 Compare two fractions with the same denominator (limit the denominators to 1, 2, 3, 4, 6, and 8), using the symbols $>$, $=$, or $<$, and/or justify the conclusions.

M03.D-M.1.2.1 Measure and estimate liquid volumes and masses of objects using standard units (cups [c], pints [pt], quarts [qt], gallons [gal], ounces [oz.], and pounds [lb]) and metric units (liters [l], grams [g], and kilograms [kg]).

M03.D-M.1.2.2 Add, subtract, multiply, and divide to solve one-step word problems involving masses or liquid volumes that are given in the same units.

M03.D-M.2.1.1 Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).

M03.D-M.2.1.2 Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). *Example 1: (One-step) "Which category is the largest?" Example 2: (Two-step) "How many more is in category A than in category B?"*

M03.D-M.2.1.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Display the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.

Common Core State Standards

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. **a.** Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. **b.** Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off a lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **a.** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. **b.** Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **d.** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step —how many more and —how many less problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

3.MD.7d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the

areas of the non-overlapping parts, applying this technique to solve real world problems.

Vocabulary

average, capacity of a container, capacity of a scale, coordinate, coordinate grid, cubic centimeter, frequency table, height of a prism, mean, median, memory, memory keys, mode, ordered pair, plotting the point, precision, square centimeter, square inch, volume, weight.

Assessment(s)

Daily Assessments: TM p. 800

Core Assessments and Progress Check: TM p. 801

Duration

14 Days

- Units

Unit 11: Probability, year-long projects, revisited

Concepts

The Length-of-Day Project revisited, national high/low temperatures summaries, spinner experiments, designing spinner, using data to predict outcomes.

PA Common Core Standards

2.2.3.A.3 Demonstrate multiplication and division fluency.

2.1.3.C.1 Explore and develop an understanding of fractions as numbers.

2.4.3.A.2 Tell and write time to the nearest minute and solve problems by calculating time intervals.

2.4.3.A.4 Represent and interpret data using tally charts, tables, pictographs, line plots, and bar graphs.

PA Eligible Content

M03.A-F.1.1.3 Recognize and generate simple equivalent fractions (limit the denominators to 1, 2, 3, 4, 6, and 8; limit numerators to whole

numbers less than the denominator). *Example 1:* $1/2 = 2/4$; *Example 2:* $4/6 = 2/3$

M03.A-F.1.1.4 Express whole numbers as fractions, and generate fractions that are equivalent to whole numbers (limit the denominators to 1, 2, 3, 4, 6, and 8). *Example 1:* Express 3 in the form $3 = 3/1$ *Example 2:* Recognize that $6/1 = 6$

M03.A-F.1.1.4 Express whole numbers as fractions, and generate fractions that are equivalent to whole numbers (limit the denominators to 1, 2, 3, 4, 6, and 8). *Example 1:* Express 3 in the form $3 = 3/1$ *Example 2:* Recognize that $6/1 = 6$

M03.D-M.2.1.1 Complete a scaled pictograph and a scaled bar graph to represent a data set with several categories (scales limited to 1, 2, 5, and 10).

M03.D-M.2.1.2 Solve one- and two-step problems using information to interpret data presented in scaled pictographs and scaled bar graphs (scales limited to 1, 2, 5, and 10). *Example 1: (One-step)* “Which category is the largest?” *Example 2: (Two-step)* “How many more is in category A than in category B?”

Common Core State Standards

3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **a.** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. **b.** Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

3.MD.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.M03.D-M.1.1.1 Tell, show, and/or write time (analog) to the nearest minute

3.M03.D-M.1.1.2 Calculate the elapsed time to the minute in a given situation (total elapsed time limited to 60 minutes or less).

3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step —how many more and —how many less problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

Vocabulary

autumnal equinox, summer solstice, vernal equinox, winter solstice.

Assessment(s)

Daily Assessments: TM p. 872

Common Assessments and Progress Check: TM p. 873

Duration

9 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.