Grade 4

Unit 1 - Arrays, Factors, and Multiplicative Comparison

Multiplication and Division 1

This unit focuses on understanding multiplication through using arrays and multiplicative comparison problems, and gaining familiarity with factors and multiples.

Investigation 1 - Representing Multiplication with Arrays

Students model multiplication situations using arrays. They use arrays to find factors and identify prime and composite numbers.

SESSION 1.1 - Things That Come in Arrays

Students consider how examples of arrays from the real world represent multiplication. They develop and share strategies for finding the product represented by an array.

CCSS-M: 4.NBT.B.5, 4.OA.B.4, Supports 4.NBT.B.4

SESSION 1.2 - Making Arrays

Students use what they know about multiplication to find all the arrays for given numbers.

CCSS-M: 4.OA.B.4, Supports 4.NBT.B.4

SESSION 1.3 - Making Arrays, continued

Students continue to use what they know about multiplication to find all the arrays for given numbers. They discuss special features of some numbers, including prime and square numbers.

CCSS-M: 4.OA.B.4, 4.NBT.B.5, Supports 4.NBT.B.4

SESSION 1.4 - Factor Pairs

Students play the array card game Factor Pairs to review the multiplication facts to 10 × 10 and solve problems in which they have to find the product represented by the array when part of the array is not visible.

CCSS-M: 4.NBT.B.5, 4.OA.A.3, Supports 4.NBT.B.4

SESSION 1.5 - Multiplicative Comparison

Students are introduced to multiplicative comparison problems. They represent and solve word problems involving multiplicative comparison and write equations to represent each problem.

CCSS-M: 4.OA.A.1, 4.OA.A.2, 4.OA.A.1, Supports 4.NBT.B.4

NOTE: Content is not final and is subject to change.
SESSION 1.6 - Prime or Composite
Students are introduced to the Ten-Minute Math activity Quick Images: Seeing Numbers. In Math Workshop students determine whether numbers are prime or composite and continue working on multiplicative comparison problems, playing Factor Pairs, and finding the number of objects in partially covered arrays.
CCSS-M: 4.NBT.B.5, 4.OA.A.1, 4.OA.A.2, 4.OA.B.4, Supports 4.NBT.B.4

SESSION 1.7 - Multiple Turn Over
Students review the terms factor and multiple and play a game, Multiple Turn Over, that provides experience determining factors and multiples. Then they answer questions on Quiz 1.
CCSS-M: 4.NBT.B.5, 4.OA.B.4, Supports 4.NBT.B.4

SESSION 1.8 - Comparison and Prime Numbers
Students complete Math Workshop activities from Session 1.6 and play Multiple Turn Over.
CCSS-M: 4.NBT.B.5, 4.OA.A.1, 4.OA.A.2, 4.OA.B.4, Supports 4.NBT.B.4

Investigation 2 - Finding Factors
Students write several different expressions that equal a given number.

SESSION 2.1 - Factors of 100
Students are introduced to another Ten-Minute Math activity, Counting Around the Class, in which they generate the multiples of a given number. They find the factors of 100 and consider how the factors of 100 can help them find the factors of 200 and 300.
CCSS-M: 4.NBT.B.5, 4.OA.B.4, Supports 4.NBT.B.4

SESSION 2.2 - Factors of Multiples of 100
Students find the factors of 200, 300, and other multiples of 100 by reasoning about the factors of 100 and other factors they know.
CCSS-M: 4.OA.B.4, 4.OA.A.3

SESSION 2.3 - Factors of Related Numbers
Students identify and represent the factors of 16 and 48 to further explore the idea that the factors of a number are also factors of a multiple of that number.
CCSS-M: 4.OA.B.4, 4.OA.A.2

SESSION 2.4 - Factors of 36
Students are assessed on benchmarks of this unit. They find and represent all the factors of 36.
CCSS-M: 4.OA.B.4, 4.NBT.B.5
Unit 2 - Generating and Representing Measurement Data

Modeling with Data
This unit focuses on using line plots to represent, describe, and compare measurement data; on modeling a real-world problem with mathematics; and on constructing arguments based on a data model.

Investigation 1 - Modeling with Data
Students record, organize, and represent data, including measuring and comparing the heights of first and fourth graders. They use line plots, other representations, and summary descriptions to model what their data show.

SESSION 1.1 - How Many Raisins in a Box?
Students record and organize data about the number of raisins in a box and describe the shape of the data distribution.
CCSS-M: 4.MD.B.4, 4.OA.B.4, Supports 4.NBT.B.4

SESSION 1.2 - How Tall Are Fourth Graders?
Students measure the heights of their classmates and use the data to describe the heights of students in the class.
CCSS-M: 4.MD.A.1, 4.MD.A.2, 4.NBT.B.4

SESSION 1.3 - Representing the Heights of Fourth and First Graders
Students complete and compare their representations of the heights of first and fourth graders. They develop arguments about what the data show.
CCSS-M: 4.MD.A.2, 4.OA.B.4, Supports 4.NBT.B.4

SESSION 1.4 - How Tall Are First Graders?
Students collect height data from a first-grade class. They create a representation of first-grade and fourth-grade height data in order to compare the groups.
CCSS-M: 4.MD.A.1, 4.MD.A.2, 4.OA.C.5

SESSION 1.5 - Representing and Comparing Data
Students use the representations of the height data to make arguments about how their data model a comparison of first- and fourth-grade heights. Students complete an assessment in which they compare two data sets.
CCSS-M: 4.MD.A.1, 4.MD.A.2, 4.NBT.B.5

NOTE: Content is not final and is subject to change.
Investigation 2 - Using Data to Compare

Students choose their own measurement data question and collect data. They represent, analyze, and draw conclusions based on evidence from comparing two data sets.

SESSION 2.1 - What Do We Want to Find Out?

Students choose data questions for comparing two groups. They test their questions, revise them, and make a plan for collecting the data.

**CCSS-M:** 4.MD.A.1, 4.MD.A.2, 4.MD.B.4, Supports 4.NBT.B.4

SESSION 2.2 - Collecting and Comparing Data

Students carry out their data questions with their own class and another class or group. They create a line plot that includes halves.

**CCSS-M:** 4.MD.A.1, 4.MD.A.2, Supports 4.NBT.B.4

SESSION 2.3 - Representing Survey Data

Students discuss how to create representations to easily compare two sets of data. They make line plot representations of their two sets of data.

**CCSS-M:** 4.MD.A.1, 4.MD.B.4, 4.OA.A.2, Supports 4.NBT.B.4

SESSION 2.4 - What Can You Learn from Your Data?

Students use the representations of their data to develop arguments about what the data show. They share what they learned from their surveys with the class.

**CCSS-M:** 4.MD.A.1, 4.MD.A.2, 4.OA.A.3

SESSION 2.5 - Mystery Data

Students describe and construct theories about three sets of mystery data that each represent the heights or lengths of the members of a group of living things. Then they answer questions on Quiz 1.

**CCSS-M:** 4.MD.A.1, 4.MD.A.2, 4.MD.B.4

SESSION 2.6 - Representing and Interpreting Data

Students discuss their arguments for what the Mystery Data Sets might be. Students represent and interpret data in an assessment activity.

**CCSS-M:** 4.MD.A.1, 4.MD.A.2, 4.MD.B.4

NOTE: Content is not final and is subject to change.
Unit 3 - Multiple Towers and Cluster Problems

Multiplication and Division 2

This unit focuses on solving multiplication problems with 2-digit numbers, understanding the meaning and structure of, and the relationship between, multiplication and division, and using that understanding to solve multiplication and division problems.

Investigation 1 - Breaking Apart Multiplication Problems

Students solve multiplication problems with small 2-digit numbers by breaking the numbers apart and representing their solutions with arrays.

SESSION 1.1 – Solving Multiplication Problems

Students solve multi-step multiplication word problems with 2-digit numbers and consider ways to break apart the problems to make them easier to solve.

CCSS-M: 4.NBT.B.5, 4.OA.A.3, 4.MD.B.4

SESSION 1.2 – Making Big Arrays

Students work on breaking apart multiplication problems by fitting smaller arrays together to construct a larger array. They discuss how many different combinations of smaller arrays they can use to make an 8 × 9 array.

CCSS-M: 4.NBT.B.5, 4.OA.B.4, 4.NBT.B.6

SESSION 1.3 – Small Array/Big Array

Students play a game in which they work on breaking multiplication problems into smaller parts by finding ways to cover arrays with two or three smaller arrays.

CCSS-M: 4.NBT.B.5, 4.OA.B.4

SESSION 1.4 - Breaking Up Arrays

Students break up arrays and solve word problems that involve multiplying 2-digit and 1-digit numbers. They discuss multiplication strategies that involve breaking apart problems.

CCSS-M: 4.OA.B.4, 4.OA.A.2, 4.NBT.B.5

SESSION 1.5 – Solving 18 × 7

Students complete an assessment in which they solve a multiplication problem and represent one way to break apart the problem with arrays.

CCSS-M: 4.NBT.B.5

NOTE: Content is not final and is subject to change.
Investigation 2 - Solving Division Problems
Students solve and represent division problems in story contexts, including problems with remainders.

SESSION 2.1 – Looking at Division
Students solve a division problem and discuss strategies with a focus on their first steps. They use these strategies as they work on a set of division word problems.

SESSION 2.2 – Division with Remainders
Students discuss strategies for solving division problems and solve division problems with remainders.
CCSS-M: 4.OA.B.4, 4.NBT.B.6

SESSION 2.3 – Division Stories
Students discuss division problems with remainders, focusing on how the remainder affects the solution in each problem situation. They solve division word problems and continue playing Small Array/Big Array.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6, 4.OA.B.4

SESSION 2.4 – Strategies for Division
Students find the missing dimension on an array when given the number of squares in the array and one dimension. Students continue to solve division word problems and discuss division strategies.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6

SESSION 2.5 - Related Multiplication and Division Problems
Students solve and represent pairs of related multiplication and division problems. Students complete Quiz 1.
CCSS-M: 4.NBT.B.5, 4.OA.A.1, 4.OA.A.2, 4.NBT.B.6

SESSION 2.6 - Writing and Solving a Division Problem
After discussing related multiplication and division problems, students complete an assessment focused on writing and solving a division story problem.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6

Investigation 3 – Strategies for Multiplication
Students examine the mathematical relationship that underlies the pattern they see when a number is multiplied by a multiple of 10. They develop strategies for solving multiplication problems with larger 2-digit numbers by breaking the problems apart in order to use number relationships that they know.

NOTE: Content is not final and is subject to change.
SESSION 3.1 – Building Multiple Towers
Students generate a list of multiples of 2-digit numbers and examine patterns and relationships in those lists.
CCSS-M: 4.NBT.B.5, 4.OA.B.4

SESSION 3.2 – Multiplying Groups of Ten
Students solve and represent related problems that involve multiples of 10 (e.g., 6 × 4 and 6 × 40) and describe the relationship between the products.
CCSS-M: 4.NBT.B.5, 4.OA.B.4

SESSION 3.3 – Multiplying by Multiples of Ten
Students solve problems that involve multiplying by a multiple of 10. They examine the mathematical relationship between a single-digit multiplication problem and related problems that include a multiple of 10.
CCSS-M: 4.OA.B.4, 4.NBT.B.5, 4.NBT.B.6

SESSION 3.4 – Doubles and Halves
Students examine what happens when one factor in a multiplication expression is doubled and the other is halved.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6

SESSION 3.5 – Multiplication Cluster Problems
Students solve multiplication problems by breaking the problems into parts or using related problems.
CCSS-M: 4.NBT.B.5

SESSION 3.6 – Strategies for Multiplication
Students develop and practice strategies for solving multiplication problems with 2-digit numbers. Students complete Quiz 2.

SESSION 3.7 - Solving Multiplication and Division Problems
Students are assessed on solving multiplication and division problems. Students continue the math workshop activities from the last session.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6, 4.OA.A.3

NOTE: Content is not final and is subject to change.
Unit 4 – Measuring and Classifying Shapes

2-D Geometry and Measurement

This unit focuses on measuring with standard units, including perimeter, area, and angles; describing and classifying 2-D shapes, and identifying mirror symmetry.

Investigation 1 – Linear Measurement

Students estimate and measure length in U.S standard and metric units and convert 4 cm measurements from larger to smaller units. They measure the perimeter of shapes and use generalizable methods to determine the perimeter of rectangles.

SESSION 1.1 – Measurement Benchmarks

Students review what linear measurement is and the used to measure length. They find objects that equal several measurement units (1 centimeter, 1 inch, 1 foot, 1 yard, 1 meter) and use these benchmarks to estimate lengths inside and outside their classroom. They examine relationships among measurement units.

CCSS-M: 4.NBT.B.4, 4.MD.A.1, 4.NBT.B.5, 4.NBT.B.6

SESSION 1.2 – Converting Measurements

Students use measurement to measure the lengths they previously estimated with benchmarks. They convert some of their measurements from feet or yards to inches and from meters to centimeters.

CCSS-M: 4.NBT.B.4, NBT.B.5, 4.MD.A.1

SESSION 1.3 – Solving Measurement Problems

Students review how to measure a perimeter and then begin a three-day math workshop in which they practice measuring lengths, finding perimeters, and converting measurements.


SESSION 1.4 – Determining the Perimeter of Rectangles

Students continue to measure lengths, find perimeters of objects around the classroom and convert lengths in Math Workshop. They also solve problems about perimeters of rectangles. They discuss general strategies for determining the perimeter of rectangles.

CCSS-M: 4.NBT.B.4, 4.MD.A.1, 4.MD.A.2, 4.NBT.B.6, 4.MD.A.3

SESSION 1.5 – Measuring Length and Determining Perimeter

Students continue to measure lengths, determine perimeters and convert measurements in Math Workshop. They discuss guidelines for measuring.

CCSS-M: 4.NBT.B.4, 4.OA.A.3, 4.MD.A.1, 4.MD.A.2, 4.MD.A.3

NOTE: Content is not final and is subject to change.
Investigation 2 - Sorting and Classifying Polygons

Students investigate the attributes of quadrilaterals and triangles. They focus on classifying polygons by the presence or absence of parallel lines and by angle size.

SESSION 2.1 – Is It a Polygon?

Students categorize shapes as polygons or not polygons and discuss the attributes of polygons. They learn about points, lines, line segments, and parallel and perpendicular lines and identify shapes with parallel or perpendicular sides.


SESSION 2.2 – Making Polygons

Students play Guess My Rule with Power Polygons in which they sort polygons according to whether the polygons have a certain attribute or not. They use Power Polygons to make new polygons that fit given descriptions.


SESSION 2.3 - Sorting Quadrilaterals

Students sort quadrilaterals according to a variety of criteria, and construct quadrilaterals with specific attributes.


SESSION 2.4 - Sorting Quadrilaterals and Triangles

Students continue to sort and make quadrilaterals and classify quadrilaterals by the absence or presence of perpendicular sides. They also sort triangles through playing Guess My Rule.


SESSION 2.5 - Making Triangles and Quadrilaterals

Students discuss angle measurement and identify angles as acute, right, or obtuse. They sort triangles by angle size and are assessed on drawing and classifying quadrilaterals.


Investigation 3 – Measuring Angles

Students use the Power Polygon TM pieces and what they know about right angles to identify, construct, and measure angles of varying degrees. They are introduced to a new measuring tool, the protractor, to measure angle sizes.

SESSION 3.1 - Making Right Angles

Students use Power Polygons to make right angles by combining acute angles. They use the relationship between the acute angles and a right angle to determine the measure of the acute angles.


NOTE: Content is not final and is subject to change.
SESSION 3.2 – Measuring and Building Angles
Students measure angles with Power Polygons. They build angles of 60, 120, and 150 degrees out of Power Polygons.

SESSION 3.3 - Measuring Angles with a Protractor
Students use Power Polygons to measure and build angles. They sketch and measure angles using a protractor.
CCSS-M: 4.NBT.B.4, 4.MD.C.5a, 4.MD.C.5b, 4.MD.C.6, 4.G.A.1

SESSION 3.4 – More Measuring and Building Angles
Students determine the number of degrees in a full circle rotation. They are introduced to a protractor and measure angles with a protractor. They discuss aspects of measuring accurately with a protractor.

Investigation 4 – Symmetry and Area
Students make symmetrical designs and find lines of symmetry in those designs. They determine the area of polygons by decomposing shapes and using symmetry. They find the area of rectangles and discuss a generalizable method. Linear Measurement.

SESSION 4.1 Mirror Symmetry
Students identify the lines of symmetry in designs and measure the area of the designs using triangles as the unit of measure. They discuss how to use the symmetry of a design to determine its area.

SESSION 4.2 – Symmetry and Area
Students make symmetrical designs from given polygons (triangles, trapezoids, hexagons, and rhombuses). They measure the area of their designs using the triangle as the unit of measure.

SESSION 4.3 - Finding Halves of Crazy Cakes
Students divide polygons in half and explain how they know the two parts are equal.

SESSION 4.4 – Area of Polygons
Students find the area of different polygons by decomposing shapes into rectangles and triangles and by using symmetry.
SESSION 4.5 - Area of Rectangles

Students determine the area of partially covered rectangles and rectangles for which only the dimensions are given. They discuss how they can use multiplication to determine the area of a rectangle.


SESSION 4.6 – Area and Angles

Students continue to find the area of rectangles. They are assessed on sketching and measuring an angle and determining the area of rectangles.

Unit 5 - Large Numbers and Landmarks
Addition, Subtraction, and the Number System

Investigation 1 - Studying Addition
Students study place value and the operation of addition as they solve addition problems fluently. They compare different types of addition strategies, including the U.S. standard algorithm, and discuss the meaning of a generalizable algorithm.

SESSION 1.1 - Solving Addition Problems
Students solve addition problems with 3-digit numbers. They examine and describe addition strategies.
CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.MD.A.2, Supports 4.NBT.B.4

SESSION 1.2 – Addition Strategies
Students create charts that show the addition strategies they are using, classified according to how each strategy starts.
CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.MD.A.2, Supports 4.NBT.B.4

SESSION 1.3 - Starter Problems
Students solve addition problems after considering several different first steps. They represent and discuss how to create equivalent addition expressions.

SESSION 1.4 - Studying the U.S. Standard Algorithm for Addition
Students compare two addition algorithms, adding by place and the U.S. standard algorithm. They talk through and make sense of the steps of the U.S. standard algorithm, and then use it to solve problems.
CCSS-M: 4.NBT.B.4, 4.NBT.B.5

SESSION 1.5 - Close to 1,000
Students play a variation of the game Close to 100 in which they make combinations of 3-digit numbers with sums equal to or close to 1,000. They practice solving addition problems using the U.S. standard algorithm for addition. Students take Quiz 1.
CCSS-M: 4.NBT.B.4, 4.NBT.B.5, 4.NBT.B.6

SESSION 1.6 – Solving an Addition Problem in Two Ways
Students continue to play Close to 1,000 and use the U.S. standard algorithm to solve addition problems. They are assessed on solving a 4-digit plus 3-digit addition problem in two ways, one way being the U.S. standard algorithm.
CCSS-M: 4.NBT.B.4, 4.NBT.B.5

NOTE: Content is not final and is subject to change.
Investigation 2 - Studying Subtraction

Students study the operation of subtraction as they solve subtraction problems fluently. They compare different types of subtraction strategies including the U.S. standard algorithm.

SESSION 2.1 Representing Subtraction Problems

Students discuss subtraction strategies and how to represent them on a number line. They practice solving subtraction problems and create story contexts for subtraction.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4

SESSION 2.2 – Strategies for Subtraction

Students represent and solve word problems in a variety of contexts: put together/take apart, compare, and removal.


SESSION 2.3 - How Did You Start?

Students describe and name subtraction strategies, according to how each strategy starts. They continue to practice subtracting numbers to 10,000.


SESSION 2.4 - Studying the U.S. Standard Algorithm for Subtraction

Students examine and discuss the notation used for the U.S. standard algorithm for subtraction. They talk through the steps of the algorithm, and then use it to solve problems.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4

SESSION 2.5 - Subtraction Starter Problems

Students examine different ways to start subtraction problems, including using the U.S. standard algorithm.

CCSS-M: 4.NBT.B.4, 4.NBT.B.5

SESSION 2.6 – Solving Subtraction Problems

Students practice solving subtraction problems with 3- and 4-digit numbers in the context of distance during Math Workshop. They also practice the U.S. standard algorithm for subtraction, and take Quiz 2.


SESSION 2.7 - Solving a Subtraction Problem

Students discuss strategies for subtraction, including the U.S. standard algorithm. They finish the Math Workshop activities, and are assessed on solving subtraction problems.


NOTE: Content is not final and is subject to change.
Investigation 3 - Adding and Subtracting Large Numbers

Students extend their understanding of place value to one million, and use what they know about place value and the operations to solve addition and subtraction problems involving 4- and 5-digit numbers.

SESSION 3.1 - Making a 10,000 Chart

Students construct a class 10,000 chart from 100 charts and examine how 10,000 is composed of 100s and 1,000s.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.A.1, 4.NBT.B.6

SESSION 3.2 – How Much Is 10,000?

Students examine the structure of 10,000 by finding the number of tens in 10,000.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.A.1

SESSION 3.3 - Working with Numbers in the 10,000s

Students add multiples of 100 and 1,000 to, and subtract them from, 5-digit numbers. They continue thinking about place value as they solve problems with large numbers.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.OA.A.3

SESSION 3.4 - Adding and Subtracting with 4- and 5-Digit Numbers (Part 1)

Students focus on what they know about place value and the operations of addition and subtraction to help them solve problems with large numbers.


SESSION 3.5 - Adding and Subtracting with 4- and 5-Digit Numbers (Part 2)

Students continue to solve problems with large numbers. During the discussion, students share strategies for solving a subtraction problem with large numbers. They also take a quiz.


SESSION 3.6 Adding and Subtracting with 4- and 5-Digit Numbers (Part 3)

Students continue to solve problems with large numbers. During the discussion, students consider which strategies they would choose for different subtraction problems. They are assessed on their ability to fluently solve addition and subtraction problems.


NOTE: Content is not final and is subject to change.
Unit 6 - Fraction Cards and Decimal Grids

Fractions and Decimals

This unit focuses on understanding the meaning of fractions and decimals; comparing fractions and decimals and finding equivalents; and using visual models to add, subtract, and multiply fractions.

Investigation 1 – Parts of Rectangles

Students find fractional parts of the area of rectangles and identify equivalent fractions. Students are introduced to decimal notation and represent and identify tenths and hundredths.

SESSION 1.1 - Fractions of an Area: Halves, Fourths, and Eighths

Students identify halves, fourths, and eighths of a 4 × 6 rectangle and discuss how they know that each fractional part is 1/2, 1/4, 2/4, 3/4, or 1/8 of the whole rectangle. They identify fractions equivalent to 1/2.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.A.1, 4.NF.B.3a, 4.NF.B.3b

SESSION 1.2 - Fractions of an Area: Thirds and Sixths

Students find thirds, sixths and twelfths of a 4 × 6 rectangle. They discuss the relationship between thirds and sixths.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.A.1, 4.NF.A.3a, Supports 4.NF.B.3b

SESSION 1.3 - Same Parts, Different Wholes

Students find equivalent fractions and explain how they know the fractions are equivalent. Students find fractional parts of different areas and compare the same fractional parts of different-sized wholes. Students are introduced to reading and writing tenths and hundredths. They relate these numbers to equivalent fractions and represent them as parts of a 10 × 10 square.


SESSION 1.4 - Representing Decimals

Students are introduced to reading and writing tenths and hundredths. They relate these numbers to equivalent fractions and represent them as parts of a 10 × 10 square.


SESSION 1.5 - Equivalent Fractions and Decimals

Students discuss whether 10, 100 and 0.3 are equal. In Math Workshop they represent decimals, use decimal and fraction notation for tenths and hundredths and find equivalent fractions, explaining how they know they are equivalent.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.A.1, 4.NF.C.6

NOTE: Content is not final and is subject to change.
Session 1.6 - finding equivalent fractions and Identifying decimals
Students continue to find equivalent fractions, determine whether fractions are equivalent, identify decimals, and represent decimals. They discuss how fractions that are equivalent are related. They are assessed on determining whether fractions are equivalent and identifying decimals.

4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.A.1, 4.NF.C.5, 4.NF.C.6

Investigation 2 - Comparing Fractions and Decimals
Students make Fraction Cards that show area representations for fractions and mixed numbers. They compare fractions and order fractions on a number line. They make conjectures about general rules for comparing fractions. Students compare and order decimals that include tenths and hundredths.

SESSION 2.1 - Fraction Cards
Students discuss how to represent and notate fractions greater than 1. They begin making a set of Fraction Cards that show area representations for a variety of fractions, including fractions with numerators greater than the denominators, and mixed numbers.

CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.A.1, 4.NF.C.6

SESSION 2.2 - Fraction Cards, continued
Students complete their set of Fraction Cards. They develop arguments about the relative size of two fractions, 3/4 and 5/6, that are each one fractional part less than a whole.

CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.2, supports 4.NF.A.1, 4.MD.A.2

SESSION 2.3 - Capture Fractions
Students compare pairs of fractions, using what they know about fraction equivalencies and relationships of fractions to 1/2 and 1. Students take Quiz 1.

CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.1, 4.NF.A.2, 4.NBT.A.2, 4.NBT.A.3

SESSION 2.4 - Comparing Fractions to Landmarks
Students compare fractions to the landmarks 0, 1/2, 1, and 2.

CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.1, 4.NF.A.2, 4.OA.A.3

SESSION 2.5 – Fractions on a Number Line
Students compare pairs of fractions to determine which is greater. They order fractions on a number line by identifying equivalent fractions and making comparisons to landmarks such as 1/2 and 1.

CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.1, 4.NF.A.2, 4.NF.A.2

SESSION 2.6 - Comparing Fractions
Students continue to order fractions on a number line. They are assessed on comparing and ordering fractions. They discuss strategies and their conjectures about general rules for fraction comparisons.

CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.1, 4.NF.A.2, 4.NBT.B.4

NOTE: Content is not final and is subject to change.
SESSION 2.7 - Decimals on the Number Line
Students make a few decimal cards, order them, and place a few on their fraction number lines. They play a game in which they compare decimals by representing them or by reasoning about the meaning of the numbers.
CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.1, 4.NF.A.2

SESSION 2.8 - Equivalent Fractions and Comparing Decimals
Students continue to make decimal cards and place them on a number line and play Decimal Compare. They discuss what they notice about equivalent fractions.
CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.C.6, 4.NF.C.7, 4.OA.A.3

Investigation 3 - Adding and Subtracting Fractions and Decimals
Students add and subtract fractions and mixed numbers including problems that involve measurement. They discuss strategies for adding and subtracting fractions and mixed numbers with like denominators. They also add tenths and hundredths.

SESSION 3.1 - Decomposing and Adding Fractions
Students decompose fractions into smaller fractions and record the decompositions using addition notation. Students add fractions and use representations to solve the problems or show their solution.
CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.A.1, 4.NF.C.6, 4.NF.C.7

SESSION 3.2 - Subtracting Fractions
Students discuss what they notice happens to the numerator and denominator when they add fractions. Students solve problems that involve subtracting fractions. They have a similar discussion about what happens when they subtract fractions.
CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.B.3a, 4.NF.B.3b, 4.NF.B.3d

SESSION 3.3 - Adding and Subtracting Mixed Numbers
Students display measurement data that includes fractions and mixed numbers on a line plot. They use that data to add and subtract mixed numbers.
CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.B.3a, 4.NF.B.3d, 4.NF.B.3d

SESSION 3.4 - Adding and Subtracting Fractions and Mixed Numbers
Students add and subtract fractions and mixed numbers as they solve problems, including measurement problems. They discuss how the strategies they are using to add or subtract these numbers are similar to strategies they used with whole numbers. Students take Quiz 2.
CCSS-M: 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.NF.B.3c, 4.MD.B.4, 4.NF.B.3a, 4.NF.B.3d

NOTE: Content is not final and is subject to change.
SESSION 3.5 - Adding Tenths and Hundredths
Students use representations to add tenths and hundredths as they play Fill Two. Students estimate and add distances in miles and tenths and hundredths of a mile in the context of running or walking.
CCSS-M: 4.NBT.A.2, NBT.A.3, 4.NBT.B.4, 4.NF.B.3a, 4.NF.B.3c, 3.NF.B.3d

SESSION 3.6 - More Adding Tenths and Hundredths
Students continue to add tenths and hundredths as they play Fill Two and calculate running distances. They discuss strategies for adding tenths and hundredths.

Investigation 4 – Computation with Rational Numbers
Students use representations to multiply fractions by whole numbers. They solve a variety of addition, subtraction and multiplication problems that include fractions and mixed numbers.

SESSION 4.1 - Multiplying A Fraction by A Whole Number
Students use visual representations to solve multiplication problems that involve fractions. They determine the multiplication equations that fit with the problems.

SESSION 4.2 - Computation with Fractions
Students continue to multiply fractions by whole numbers and they discuss strategies for multiplying fractions by whole numbers. They also solve addition and subtraction problems with fractions.
CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NFB.4c

SESSION 4.3 - Computation with Fractions, continued
Students continue to solve problems about fractions that involve a variety of operations. Students take Quiz 3.
CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.B.3c, 4.NF.B.3d, 4.NF.C.5, 4.MD.A.2, 4.NF.B.4c

SESSION 4.4 - Multiplying, Adding and Subtracting Fractions
Students discuss computation with fractions and compare it to computation with whole numbers. Students are assessed on multiplying a fraction by a whole number and adding and subtracting fractions.
CCSS-M: 4.NF.B.4a, 4.NF.B.4b, 4.NF.B.3c, 4.NF.B.3d, 4.NF.B.4c, 4.NF.C.5, 4.MD.A.2

NOTE: Content is not final and is subject to change.
Unit 7 - How Many Packages and Groups?

Number and Operations 4

This unit focuses on the operations of multiplication and division, including problems involving converting measurements. Students refine their strategies for solving multiplication problems with two 2-digit numbers and with a 4-digit number and a 1-digit number, and they use the relationship between multiplication and division to develop and practice strategies for solving division problems with up to a 4-digit dividend and a 1-digit divisor. Students develop fluency with these problems.

Investigation 1 - Multiplication With 2-Digit Numbers

Students estimate products and practice strategies for solving multiplication problems with 2-digit factors. This includes solving measurement conversion problems.

SESSION 1.1 - Measurement Equivalents

Students are introduced to measurement equivalents for weight, mass, capacity, and time and review equivalents for distance. They use multiplication to convert larger units into smaller units.

CCSS-M: 4.MD.A.2, 4.NBT.B.5, 4.MD.A.1

SESSION 1.2 - Measurement Problems

Students solve multi-step measurement problems that involve multiplication and other operations. They write equations that represent the problem with a letter standing for the unknown.

CCSS-M: 4.MD.A.1, 4.MD.A.2, 4.OA.A.3, 4.NBT.B.5

SESSION 1.3 - Making Estimates

Students make estimates for 2-digit multiplication problems, using what they know about multiplication and multiplying by numbers such as multiples of 10.

CCSS-M: 4.MD.A.2, 4.NBT.B.4, 4.NBT.B.5, 4.OA.A.3

SESSION 1.4 - Breaking Numbers Apart

Students estimate and solve 2-digit by 2-digit multiplication problems. They discuss ways to break either one or both factors apart in order to solve multiplication problems and use story contexts to keep track of all the parts of the problem.

CCSS-M: 4.NBT.B.5

NOTE: Content is not final and is subject to change.
SESSION 1.5 - Multiplication Cluster Problems
Students solve problems that help them consider how to break apart 2-digit multiplication problems. They discuss ways to represent their solutions with arrays and with groups.
CCSS-M: 4.NBT.B.5, 4.NF.A.1

SESSION 1.6 - Solving Multiplication Problems
Students play a game in which they identify factors for multiples of 10. They solve cluster problems and make estimates for and solve 2-digit multiplication problems.
CCSS-M: 4.NBT.B.5

SESSION 1.7 - Solving 2-Digit Problems
Students continue to play Factor Bingo and solve 2-digit multiplication problems. They discuss ways to keep track of all the parts of a problem.
CCSS-M: 4.MD.A.2, 4.NBT.B.5, Supports 4.OA.B.4

Investigation 2 - Strategies for Multiplication
Students practice strategies for solving 2-digit by 2-digit and 4-digit by 1-digit multiplication problems, including breaking one or both factors apart, or changing the numbers to make an easier problem.

SESSION 2.1 - Making an Easier Problem
Students solve a multiplication problem by first changing one of the factors to a number that is a multiple of 10. They consider what happens if you multiply by too much and then have to adjust the product.
CCSS-M: 4.MD.A.2, 4.NBT.B.5, 4.OA.A.3

SESSION 2.2 - Solutions to Cluster Problems
Students practice solving a variety of multiplication problems and they discuss which problems they used to solve the final problems in cluster problem sets.
CCSS-M: 4.NBT.B.5, Supports 4.OA.B.4

SESSION 2.3 - Multiplying 4-Digit by 1-Digit Numbers
Students multiply 4-digit by 1-digit numbers and continue practicing solving a variety of multiplication problems. Students take Quiz 1.
CCSS-M: 4.NBT.B.5, Supports 4.OA.B.4

NOTE: Content is not final and is subject to change.
SESSION 2.4 - Practicing Multiplication
Students continue solving multiplication problems. They discuss and compare strategies for solving a 2-digit by 2-digit multiplication problem.
CCSS-M: 4.NBT.B.5, 4.OA.A.2, 4.MD.A.2

SESSION 2.5 - Multiplication Problems
Students continue to solve multiplication problems in Math Workshop. They are assessed on their ability to solve 2-digit by 2-digit multiplication problems.
CCSS-M: 4.NBT.B.5, 4.OA.A.2

Investigation 3 - Solving Division Problems
Students use representations and story contexts to develop strategies for solving division problems with up to 4-digit dividends and 1-digit divisors.

SESSION 3.1 - How Many Teams?
Students solve division problems and discuss strategies for solving the problems.
CCSS-M: 4.NBT.B.4, 4.NBT.B.5, 4.NBT.B.6

SESSION 3.2 - Solving Division Problems
Students use their knowledge of factors and multiples to solve problems about multiple towers. They also solve division word problems.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6

SESSION 3.3 - Dividing 4-Digit Numbers by 1-Digit Numbers
Students solve division problems including those that involve dividing a 4-digit number by a 1-digit number. They also continue to solve problems about multiple towers.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6

SESSION 3.4 - Multi-Step Problems and Division Strategies
Students represent multi-step problems with equations and solve the problems. They continue to solve division problems and discuss solving division problems efficiently.
CCSS-M: 4.OA.A.3, 4.NBT.B.5, 4.NBT.B.6

SESSION 3.5 - Multiplication and Division Problems
Students solve both multiplication and division problems in story contexts. They continue to solve multi-step problems and discuss strategies for solving division problems. Students take Quiz 2.
CCSS-M: 4.NBT.B.5, 4.NBT.B.6, 4.OA.A.3

NOTE: Content is not final and is subject to change.
SESSION 3.6 - Multiplication, Division and Multi-Step Problems

Students continue the Math Workshop from the last session. Students are assessed on solving multiplication and division problems.


NOTE: Content is not final and is subject to change.
Unit 8 - Penny Jars and Towers

Analyzing Patterns and Rules

In this unit, ideas about the ways in which situations with two varying quantities can be mathematically modeled and analyzed are developed through activities focusing on solving multistep problems, generating and analyzing patterns, and using symbolic notation to model situations. Two contexts (Penny Jars and Windows and Towers) are used that include both additive and multiplicative situations. Students work with arithmetic patterns and functions represented by tables, graphs, and equations, which sometimes use letters to represent unspecified quantities.

Investigation 1 - Representing and Analyzing Patterns

Students work with two contexts (Penny Jars and Windows and Towers) that each have a starting amount and a constant amount of increase. Students use tables, arithmetic expressions, and symbolic notation to represent, describe, and compare the relationships between the two quantities in each context.

SESSION 1.1 - The Penny Jar

Students are introduced to the Penny Jar context. They model a Penny Jar situation with pictures or diagrams and discuss how these show the starting amount, the amount added each round, and the total amount.


SESSION 1.2 - Penny Jar Tables

Students model the Penny Jar context with tables. They investigate the structure of the Penny Jar situation as they develop methods for finding the number of pennies in the Penny Jar after skipping several rounds. They articulate a rule for what they notice about the relationship between number of rounds and total number of pennies.


SESSION 1.3 - Arithmetic Patterns

Students write rules for Penny Jars using letters to stand for varying quantities. They describe and analyze arithmetic patterns represented in tables to explain why certain values for the total number of pennies will or will not occur.


NOTE: Content is not final and is subject to change.
SESSION 1.4 - Round 20
Students record calculations for a new Penny Jar situation. They develop arguments and representations to show how the total number of pennies in Round 20 is related to the total in Round 10.

SESSION 1.5 - Penny Jar Comparisons
Students use tables and arithmetic expressions to represent and compare Penny Jar situations. They reason about how the starting numbers of pennies and the number added each round affect the increase in the total numbers of pennies.

SESSION 1.6 - Windows and Towers
Students are introduced to a new context—Windows and Towers. During Math Workshop, students use tables and mathematical notation to model the new context and work on Penny Jar Comparisons.

SESSION 1.7 - Square and Corner Towers
Students discuss their rules for finding the numbers of windows in both the single and double towers and work on completing tables and writing arithmetic expressions for finding the numbers of windows in square and corner towers. During Math Workshop, they solve multi-digit problems about giant Penny Jars using multiplication and division.

SESSION 1.8 - Comparing Two Penny Jar Situations
Students continue working with tables and mathematical expressions to describe and compare contexts and solve problems. They make arguments about how the total number of pennies in two Penny Jar situations compare as the number of rounds increases. Students take Quiz 1.

NOTE: Content is not final and is subject to change.