Math 4

Semester A Summary:

In Math 4 A, the student will learn mathematical concepts related to place value, adding and subtracting multi-digit whole numbers, strategies for multiplication and division, factors, multiples, algebra, and patterns. Concepts are developed using mathematical processes of problem-solving, reasoning, communicating, representing, and making connections. Building both conceptual knowledge and procedural fluency supports the student's development of mathematical thinking and reasoning in solving various problems of authentic contexts.

Semester A Outline

1. **Welcome to Math 4**
    1. Get Ready to Learn Math
        - Meet Clara the cat, your learning buddy for the course
        - Describe the different parts of a lesson
        - Describe the different types of assessments
        - Locate and describe lesson icons and assets
2. **Generalize Place Value Understanding**
    1. Numbers Through One Million
        - Read and write numbers in expanded form, with numerals, and using number names
    2. Place Value Relationships
        - Recognize the relationship between adjacent digits in a multi-digit number
    3. Compare Whole Numbers
        - Use place value to compare multi-digit numbers
    4. Round Whole Numbers
        - Use place value to round multi-digit numbers
    5. Math Practices: Construct Arguments
        - Use previously learned concepts and skills to construct arguments about place value
    6. Generalize Place Value Understanding Unit Test
3. **Fluently Add and Subtract Multi-Digit Numbers**
    1. Mental Math: Find Sums and Differences
        - Add and subtract whole numbers mentally using a variety of methods
        - Recognize and demonstrate the meaning of equality in an equation
    2. Mental Math: Estimate Sums and Differences
        - Round greater whole numbers to estimate sums and differences
    3. Add Whole Numbers
        - Add numbers to one million with and without regrouping using the standard algorithm
    4. Subtract Whole Numbers
        - Use place value and an algorithm to subtract whole numbers
    5. Subtract Across Zeros

- Use number sense and regrouping to subtract across zeroes

6. Math Practices and Problem Solving: Reasoning
    - Use previously learned concepts and skills to reason abstractly and make sense of quantities and their relationships in problem situations
7. Add and Subtract Multi-Digit Numbers Unit Test

4. Multiply by 1-Digit Numbers

1. Multiply by Multiples of 10, 100, and 1,000
    - Multiply multiples of 10, 100, and 1,000 using mental math and place-value strategies
2. Round to Estimate Products
    - Use rounding to estimate products and check if answers are reasonable
3. The Distributive Property
    - Use the Distributive Property to multiply larger numbers
4. Mental Math Strategies for Multiplication
    - Use place value and properties of operations to multiply mentally
5. Arrays and Partial Products
    - Use arrays and partial products to multiply 3- and 4-digit numbers by 1-digit numbers
6. Multiply by 1-Digit Numbers: Partial Products
    - Use place value and partial products to multiply 3- and 4-digit numbers by 1-digit numbers
7. Multiply 2- and 3-Digit Numbers by 1-Digit Numbers
    - Use place value and the standard algorithm to multiply 2- and 3-digit numbers by 1-digit numbers
8. Multiply 4-Digit by 1-Digit Numbers
    - Use the standard algorithm to multiply 4-digit numbers by 1-digit numbers
9. Multiply by 1-Digit Numbers
    - Use the standard algorithm to multiply 2-, 3-, and 4-digit numbers by 1-digit numbers. Estimate to check if answers are reasonable.
10. Math Practices: Model with Math
    - Use previously learned concepts and skills to represent and solve problems
11. Multiply by 1-Digit Numbers Unit Test

5. Multiply by 2-Digit Numbers

1. Mental Math: Multiply Multiples of 10
    - Use mental math strategies to multiply 2-digit by 2-digit multiples of ten
2. Multiply 2-Digit Numbers by Multiples of 10
    - Use models and properties of operations to multiply 2-digit numbers by multiples of ten
3. Estimate: Use Rounding
    - Estimate products for 2-digit by 2-digit multiplication by rounding the factors to multiples of ten
4. Use Compatible Numbers
    - Use compatible numbers to estimate products of 2-digit by 2-digit multiplication problems
5. Arrays and Partial Products
    - Use arrays, place value, partial products and properties of operations to multiply two 2-digit numbers
6. Multiply Using the Distributive Property
    - Use the Distributive Property and an area model to multiply two 2-digit numbers
7. Multiply by 2-Digit Numbers: Partial Products

- Use place value and partial products to calculate products of 2-digit by 2-digit multiplication problems

8. Multiply 2-Digit Numbers by Multiples of 10
    - Use area models and place-value strategies to multiply 2-digit numbers by multiples of 10
9. Multiply 2-Digit by 2-Digit Numbers
    - Use the expanded and the standard algorithm to multiply 2-digit by 2-digit numbers and estimate to check if the products are reasonable
    - Use models and algorithms to solve 2-digit by 2-digit multiplication problems
10. Math Practices: Make Sense and Persevere
    - Make sense of problems and persevere in solving them
11. Multiply by 2-Digit Numbers Unit Test

6. Divide by 1-Digit Numbers

1. Mental Math: Find Quotients
    - Use mental-math and place-value strategies to divide multiples of 10 and 100 by 1-digit divisors
2. Mental Math: Estimate Quotients
    - Use compatible numbers to estimate quotients
3. Estimate Quotients for Greater Dividends
    - Use place-value patterns and division facts to estimate quotients for 4-digit dividends
4. Interpret Remainders
    - Solve division problems and interpret remainders
5. Division as Sharing
    - Use place value and drawings to divide 2- and 3- digit numbers by 1-digit numbers
6. Use Partial Quotients to Divide
    - Use partial quotients to divide
7. Use Partial Quotients to Divide Greater Dividends
    - Use partial quotients and place-value understandings to divide with greater dividends
8. Divide with 1-Digit Numbers
    - Divide 2- and 3-digit numbers by 1-digit numbers using the standard division algorithm
    - Divide 4-digit numbers by 1-digit numbers using the standard division algorithm
9. Math Practices: Model with Math
    - Use previously-learned concepts and skills to model and solve problems
10. Divide by 1-Digit Numbers Unit Test

7. Solve Problems with Whole Numbers

1. Solve Comparison Situations
    - Interpret comparisons as multiplication or addition equations
    - Use multiplication and division to compare two quantities
2. Solve Multi-Step Problems
    - Solve two-step problems by finding and solving the hidden question first
3. Solve More Multi-Step Problems
    - Solve multi-step problems by finding and solving hidden questions first
4. Math Practices: Make Sense and Persevere
    - Make sense of a multi-step problem and keep working until it is solved
5. Solve Problems with Whole Numbers Unit Test

8. Algebra: Generate and Analyze Patterns

1. Number Sequences
    - Create or extend a number sequence based on a rule
    - Identify features of the pattern in the sequence that are not described by the rule
2. Patterns: Number Rules
    - Use a rule to extend a number pattern and solve a problem
    - Identify features of the pattern
3. Patterns: Repeating Shapes
    - Generate a shape pattern that follows a given rule and predict a shape in the pattern
4. Probability
    - Determine the likelihood of an outcome of a simple event
    - Represent probability as a number
    - Create a model to represent a given probability
5. Math Practices: Look for and Use Structure
    - Solve problems by using patterns
6. Algebra: Generate and Analyze Patterns Unit Test

9. Factors and Multiples

1. Understand Factors
    - Use arrays to find the factors of a given whole number
2. Factors
    - Use multiplication to find all the factor pairs for a whole number
    - Find common factors of two or more numbers
3. Prime and Composite Numbers
    - Use factors to determine whether a whole number greater than 1 is a prime or composite
4. Multiples
    - Use multiplication to find multiples of a given number
    - Find common multiples of two or more numbers
5. Math Practices: Repeated Reasoning
    - Use repeated reasoning to generalize how to solve problems that are similar
6. Factors and Multiples Unit Test

Semester B Summary:

In Math 4 B, the student will learn mathematical concepts related to fraction equivalence, adding, subtracting, and multiplying fractions, comparing decimals, interpreting data, angles, lines, shapes, and measurement. Concepts are developed using mathematical processes of problem-solving, reasoning, communicating, representing, and making connections. Building both conceptual knowledge and procedural fluency supports the student's development of mathematical thinking and reasoning in solving various problems of authentic contexts.

Semester B Outline

1. Welcome to Math 4

1. Get Ready to Learn Math
    - Meet Clara the cat, your learning buddy for the course
    - Describe the different parts of a lesson
    - Describe the different types of assessments
    - Locate and describe lesson icons and assets

2. Fraction Equivalence and Ordering

1. Equivalent Fractions: Area Models
    - Use area models to recognize and generate equivalent fractions
2. Equivalent Fractions: Number Lines
    - Use a number line to locate and identify equivalent fractions
3. Generate Equivalent Fractions: Multiplication
    - Use multiplication to find equivalent fractions
4. Generate Equivalent Fractions: Division
    - Use division to find equivalent fractions
5. Compare Fractions
    - Use benchmarks, area models, and number lines to compare fractions
    - Use models or rename fractions to compare
6. Order Fractions and Mixed Numbers
    - Compare fractions and mixed numbers
    - Order fractions and mixed numbers
7. Fraction Equivalence and Ordering Unit Test

3. Addition and Subtraction of Fractions

1. Model Addition of Fractions
    - Use fraction strips and number lines to add fractions
2. Decompose Fractions
    - Decompose a fraction or mixed number into a sum of fractions in more than one way
3. Add Fractions with Like Denominators
    - Solve problems involving joining parts of the same whole by adding fractions
4. Model Subtraction of Fractions
    - Use tools such as fraction strips, area models, and number lines to subtract fractions
5. Subtract Fractions with Like Denominators
    - Solve problems involving separating parts of the same whole by subtracting fractions
6. Add and Subtract Fractions with Like Denominators
    - Count forward or backward on a number line to add or subtract
7. Estimate Fraction Sums and Differences
    - Use number lines and benchmark fractions to estimate fraction sums and differences
8. Model Addition and Subtraction of Mixed Numbers
    - Use models and equivalent fractions to add and subtract mixed numbers
9. Add Mixed Numbers
    - Use equivalent fractions and properties of operations to add mixed numbers with like denominators
10. Subtract Mixed Numbers
    - Use equivalent fractions, properties of operations, and the relationship between addition and subtraction to subtract mixed numbers with like denominators
11. Math Practices: Model with Math
    - Use previously learned concepts and skills to represent and solve problems
12. Addition and Subtraction of Fractions Unit Test

4. Multiplication Concepts with Fractions

1. Fractions as Multiples of Unit Fractions
    - Use a model to understand a fraction as a multiple of a unit fraction
2. Multiply a Fraction by a Whole Number
    - Use models to multiply fractions by whole numbers

- Use symbols and equations to multiply a fraction by a whole number

3. Multiply a Whole Number and a Mixed Number
    - Use drawings and equations to represent and solve problems involving a whole number and a mixed number
4. Solve Time Problems
    - Use the four operations to solve problems involving time
5. Math Practices: Model with Math
    - Use previously learned concepts and skills to represent and solve problems
6. Multiplication Concepts with Fractions Unit Test

5. Understand and Compare Decimals

1. Fractions and Decimals
    - Relate fractions and decimals with denominators of 10 and 100
    - Locate and describe fractions and decimals on number lines
2. Compare and Round Decimals
    - Compare decimals by reasoning about their size
    - Round decimals to the nearest whole number
3. Add and Subtract Fractions and Mixed Numbers
    - Add and subtract fractions and mixed numbers with unlike denominators
4. Solve Word Problems Involving Money
    - Use fractions or decimals to solve word problems involving money
5. Math Practices: Look for and Use Structure
    - Use the structure of the place-value system for decimals to solve problems
6. Understand and Compare Decimals Unit Test

6. Show and Interpret Data on Line Plots

1. Read Line Plots
    - Read and interpret data using line plots
2. Make Line Plots
    - Represent data using line plots and interpret data in line plots to solve problems
3. Use Line Plots to Solve Problems
    - Solve problems involving line plots and fractions
4. Collect, Organize, and Represent Data
    - Collect, organize, represent, and interpret data in bar graphs and line graphs
    - Compare the same data shown in a bar graph and a tally chart
5. Show and Interpret Data on Line Plots Unit Test

7. Angles and Angle Measurement

1. Lines, Rays, and Angles
    - Recognize and draw lines, rays, and angles with different measures.
2. Understand Angles and Unit Angles
    - Find the measure of an angle that turns through a fraction of a circle
3. Measure with Unit Angles
    - Use known angle measures to measure unknown angles
4. Measure and Draw Angles
    - Use a protractor to measure and draw angles
5. Add and Subtract Angle Measures
    - Use addition and subtraction to solve problems with unknown angle measures
6. Math Practices: Use Appropriate Tools
    - Use appropriate tools, such as a protractor and ruler, to solve problems
7. Angles and Angle Measurement Unit Test

8. Lines, Angles, and Shapes

1. Lines
    - Draw and identify perpendicular, parallel, and intersecting lines
2. Classify Triangles
    - Classify triangles by line segments and angles
3. Classify Quadrilaterals
    - Classify quadrilaterals by lines and angles
4. Line Symmetry
    - Recognize and draw lines of symmetry; identify line symmetric figures
5. Draw Shapes with Line Symmetry
    - Draw figures that have symmetry
6. Math Practices: Critique Reasoning
    - Use understanding of two-dimensional shapes to critique the reasoning of others
7. Lines, Angles, and Shapes Unit Test

9. Find Equivalence in Units of Measure

1. Exploring Customary Units of Length
    - Recognize the relative size of customary units of length and convert from a larger unit to a smaller unit
    - Estimate and measure length using customary units
2. Equivalence with Customary Units of Capacity
    - Recognize the relative size of customary units of capacity and convert from a larger unit to a smaller unit
3. Equivalence with Customary Units of Weight
    - Recognize the relative size of customary units of weight and convert from a larger unit to a smaller unit
4. Exploring Metric Units of Length
    - Recognize the relative size of metric units of length and convert from a larger unit to a smaller unit
    - Estimate and measure length using metric units
5. Equivalence with Metric Units of Capacity and Mass
    - Recognize the relative size of metric units of capacity and mass, and convert from a larger unit to a smaller unit
6. Solve Perimeter and Area Problems
    - Find the unknown length or width of a rectangle using the known area or perimeter
7. Math Practices: Precision
    - Be precise when solving measurement problems
8. Find Equivalence in Units of Measure Unit Test

10. Step Up to Grade 5

1. Understand Decimal Place Value
    - Read and write numbers with decimals through thousandths using standard form, expanded form, and number names; identify equivalent decimals
2. Compare Decimals
    - Use place value to compare decimals through thousandths
3. Use Models to Add and Subtract Decimals
    - Model sums and differences of decimals
4. Estimate Products of a Decimal and a Whole Number
    - Use rounding and compatible numbers to estimate the product of a decimal and a whole number