Newburyport Public Schools
The Port Where Tradition and Innovation Converge

Newburyport Math Curriculum Framework Guide

Grade 4 Focus Areas

In grade 4, the focus of student learning is on four areas:

1. Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.
2. Developing an understanding of fraction equivalence, addition and subtraction of fractions.
3. Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Mathematical Practice Standards

These 8 practice standards describe ways in which students do or approach math. The are the foundation for mathematical thinking and help to develop a more advanced understanding. These standards are the habits & strategies mathematically proficient students have and can be applied in everyday life.

1. Makes sense of problems and persevere in solving them.
2. Reasons abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others
4. Model with 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

Grade 4 Overview

Operations & Algebraic Thinking
- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

Number & Operations in Base Ten
- Generalize place value understanding for multi-digit whole numbers less than or equal to 1,000,000.
- Use place value understanding and properties of operations to perform multi-digit arithmetic on whole numbers less than or equal to 1,000,000.

Number & Operations-Fractions
- Extend understanding of fraction equivalence and ordering for fractions ordering for fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers for fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
- Understand decimal notation for fractions, and compare decimal fractions.

Measurement & Data
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.
- Geometric measurement: Understand concepts of angle and measure angles.

Geometry
- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Operations & Algebraic Thinking

Use the four operations with whole number to solve problems.
- Interpret a multiplication equation as a comparison.
- Multiply or divide to solve word problems involving multiplicative comparison.
- Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.

Gain familiarity with factors and multiples
- Find all factor pairs for a whole number in the range 1−100.
- Recognize that a whole number is a multiple of each of its factors.
- Determine whether a whole number in the range 1−100 is a multiple of a given one-digit number.
- Determine whether a given whole number in the range 1−100 is prime or composite.

Generate and analyze patterns
- Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

Number & Operations in Base Ten

Generalize place value understanding for multi-digit whole numbers less than or equal to 1,000,000.
- Recognize that in a multi-digit whole number, a digit in any place represents 10 times as much as it represents in the place to its right.
- Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place.
- Use place value understanding to round multi-digit whole numbers to any place.

Use place value understanding and properties of operations to perform multi-digit arithmetic on whole numbers less than or equal to 1,000,000.
- Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.
- Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.

Number & Operations-Fractions

Extend understanding of fraction equivalence and ordering for fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
- Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models. Use this principle to recognize and generate equivalent fractions, including fractions greater than 1.
- Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers for fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
- Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
- Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

Understand decimal notation for fractions, and compare decimal fractions.
- Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.
- Use decimal notation to represent fractions with denominators 10 or 100
- Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole

Measurement & Data

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

- Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec.
- Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money.
- Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.

Represent and interpret data.

- Make a line plot representation to display a data set of measurements in fractions of a unit.
- Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Geometric measurement: Understand concepts of angle and measure angles.

- Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
- Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- Recognize angle measure as additive. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.

Geometry

Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

- Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size.
- Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts.