



Greenwich Public Schools Curriculum Overview

Grade 4: Mathematics

Families as Partners in Learning

In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing an understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (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.

All grade 4 units of study are directly aligned with the approved Connecticut Core Standards for Mathematics.

The GPS Mathematics Program uses the philosophy of CPA (Concrete, Pictorial, Abstract). In the concrete stage, students use manipulatives to explore new concepts. In the pictorial stage, ideas are represented as models to help demonstrate the relationships between numbers. In the abstract stage, students connect their concrete experiences and pictorial representations to abstract symbols and numbers.

Unit	Student Learning Expectations
<p>Unit 1: Multi-Digit Whole Number Computation</p> <p>Enduring Understandings:</p> <ul style="list-style-type: none"> A problem solver understands what has been done, knows why the process was appropriate, and can support it with reasons and evidence. 	<p>Students will Do:</p> <ul style="list-style-type: none"> I can add multi-digit numbers using the standard algorithm (starting in the ones place, then moving to the tens place, etc) I can subtract multi-digit numbers using the standard algorithm (starting in the ones place, then moving to the tens place, etc.) I can explain how a multiplication equation can be interpreted as a comparison. I can write an equation for a situation involving multiplicative comparison. I can explain the difference between multiplicative (as many times as) and additive (more) comparisons. I can determine when to multiply or divide in word problems. I can choose the correct operation to solve a multi-step word problem. I can interpret the meaning of the remainder in a word problem.



There can be different strategies to solve a problem, but some are more effective and efficient than others are.

- The context of a problem determines the reasonableness of a solution.
- When dividing the remainder must be less than the divisor. The nature of the question asked determines how to interpret and use the remainder.
- Multiplication and division have an inverse relationship. The inverse relationship between multiplication and division can be used to solve problems.
- Statements of comparison (“times as many”) are other ways to think about multiplication or division.
- Mathematical situations can be represented with equations using letters for the unknown quantity which may appear in any position.
- The relationships among the operations and their properties promote computational fluency.



Factors, Multiples and Problems involving Measurement

Enduring Understandings:

- Patterns and relationships can be represented numerically, graphically, symbolically, and verbally.
- Patterns provide insights into potential relationships.
- Measurement describes the attributes of objects and events.
- Some numerical sequences have rules that tell how to generate more numbers in a sequence.
- The product of any nonzero number and any other nonzero number is divisible by each number and called a multiple of each number.
- A product is the result of multiplying numbers that are called factors.
- Relationships between customary and metric measurement units can be expressed as a function (i.e. 12 inches to 1ft or 12 in. = 1 ft).

Students will Do:

- I can describe the relative size of units (1000 m in a km, 100 cm in a m, 16 ounces are in a pound).
- I can represent a larger unit with smaller units (36 m = 3,600 cm, 4 yards = 144 inches).
- I can solve word problems that apply what I know about perimeter and area.
- I can define factors and multiples and list the factor pairs of any number between 1 and 100.
- I can define prime and composite numbers and determine if a number is prime or composite.
- I can generate a pattern that follows a given rule.
- I can identify additional patterns within a pattern that go beyond the rule.



Some problems can be solved by applying the formula for the perimeter of a rectangle or the formula for the area of a rectangle.

Unit 3: Understanding and Using Place Value to Multiply And Divide

Enduring Understandings:

- Numbers have different meanings based on placement of the digits
- Place value helps us know if a number is bigger or smaller based on the meanings of the digits in each place
- You can use place value, equations, rectangular arrays, and/or area models.
- When you divide whole numbers sometimes there is a remainder; the remainder must be less than the divisor.
- Multi-digit numbers can be expressed in multiple ways.
- A problem solver understands what has been done, knows why

Students will Do:

- I can explain the value of each digit as ten times the value to the right (connection to bundles of 10).
- I can read and write a number in word form, standard, and expanded form.
- I can compare numbers using place value and symbols.
- I can explain how to use digits to round a number.
- I can write a multi-digit number rounded to any place.
- I can multiply a multidigit number by a one-digit number.
- I can demonstrate multiplication of two two-digit numbers using rectangular arrays, place value, and the area model.
- I can demonstrate division of a multi-digit number using place value, rectangular arrays, and area models.
- I can use +, -, x, and ÷ to solve word problems.
- I can solve measurement word problems that include whole numbers, fractions, and decimals.
- I can convert larger units into equivalent smaller units to solve a problem.



<p>... process was ... appropriate, and can support it with reasons and evidence.</p> <ul style="list-style-type: none"> • There can be different strategies to solve a problem, but some are more effective and efficient than others are. • The context of a problem determines the reasonableness of a solution. 	
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<p>Unit 4: Comparing Fractions and Understanding Decimal Notation</p> <p>Enduring Understandings:</p> <ul style="list-style-type: none"> • The same fractional amount can be represented by an infinite set of different but equivalent fractions. • Benchmark fractions such as $\frac{1}{2}$ are useful when comparing two fractions to each other. • Fraction models such as fraction bars and number lines are useful when determining fraction equivalence. 	<p>Students will Do:</p> <ul style="list-style-type: none"> • I can explain why fractions are equivalent. • I can create equivalent fractions. • I can use models to explain why different fractions are equivalent. • I can explain that comparing 2 fractions must refer to the same whole. • I can compare 2 fractions by reasoning about their size. • I can compare 2 fractions by creating equivalent fractions with a common denominator (if needed). • I can order fractions using $<$, $>$, and $=$ and justify the comparison. • I can write a fraction with a denominator of 10 as an equivalent fraction with a denominator of 100. • I can add two fractions with denominators 10 and 100. • I can justify the comparison of two decimals by reasoning about their size and using a model. • I can explain the relationship between a fraction and a decimal. • I can show a fraction with a denominator of 10 or 100 as a decimal. • I can identify the tenths and hundredths place. • I can show a decimal on a number line. • I can justify the comparison of two decimals by reasoning about their size and using a model. • I can compare decimals to the hundredths place.
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decimal is another
me for a fraction

- Decimal numeration is just an extension of whole number numeration.
- Place value can be used to compare and order decimals.

Unit 5: Building Understanding of Addition, Subtraction and Multiplication of Fractions

Enduring Understandings:

- When adding or subtracting fractions with like denominators, you are adding or subtracting portions of the same size. So, you can add or subtract the numerators without changing the denominators.
- One way to add mixed numbers is to add the fractional parts and then add the whole number parts. Sometimes whole numbers or fractions need to be renamed.
- One way to subtract mixed numbers is to subtract the fractional

Students will Do:

- I can use models to add and subtract fractions.
- I can use visual models to decompose a fraction. For example, $7/12 = 4/12 + 1/12 + 1/12 + 1/12$.
- I can add or subtract mixed numbers.
- I can solve word problems with fractions.
- I can explain why $a/b = a \times 1/b$ using models. For example, $3/4 = 1/4 + 1/4 + 1/4 = 3 \times 1/4$.
- I can decompose a fraction into multiple unit fractions. $5 \times 7/8 = 5 \times (7 \times 1/8) = (5 \times 7) \times 1/8 = 35 \times 1/8$ -or- $35/8$.
- I can solve word problems that involve a whole number and a fraction.
- I can create a line plot with fractions.
- I can use the information on the line plot to answer addition and subtraction problems.



parts and then the whole number parts.

- Sometimes whole numbers or fractions need to be renamed.
- Models can be used to show different ways of adding and subtracting mixed numbers
- Some data can be represented using a line plot and the line plot can be used to answer certain questions about the data.
- A fractional amount can be decomposed into a sum of fractions in more than one way.
- Models can be used to find the product of a whole number and a fraction.
- Fractions can be built from unit fractions by applying and extending understandings of operations on whole numbers.

Unit 6: 2D Figures and Concepts of Angle and Measuring Angles

Enduring Understandings:

- Geometry and spatial sense offer ways to

Students will Do:

- I can identify and draw an example of point, line, line segment, ray, angle, parallel lines, and perpendicular lines.
- I can classify two-dimensional shapes into categories (including those with/without parallel line segments and perpendicular line segments)
- I can classify shapes by its angles.
- I can identify a right triangle.



Interpret and reflect on our physical environment.

- Analyzing geometric relationships develops reasoning and justification skills.
- Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by size.
- The measure of an angle depends upon the fraction of the circle cut off by its rays.
- The unit for measuring the size of the opening of an angle is 1 degree.
- Angle measure can be added or subtracted.
- Polygons can be described and classified by their sides and angles.

- I can identify shapes with symmetry.
- I can define symmetry.
- I can draw a line of symmetry.
- I can identify the parts of an angle and define what an angle is.
- I can explain that an angle is measured in degrees.
- I can measure an angle using a protractor.
- I can sketch angles when given a measurement.
- I can use a protractor to create a given angle.
- I can explain that the angle measurement is the sum of its decomposed angles.
- I can write an equation with an unknown angle measurement.
- I can solve word problems involving unknown angles.