Grade 5
Unit 1: Whole Number Operations and Applications: Volume, Multiplication, and Division

Skills and Standards

- **NY-5.MD.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
- **NY-5.MD.3a** Recognize that a cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
- **NY-5.MD.3b** Recognize that a solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
- **NY-5.MD.4** Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units.
- **NY-5.MD.5** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
- **NY-5.MD.5a** Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base.
- **NY-5.MD.5b**. Apply the formulas V = l × w × h and V = B × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
- **NY-5.MD.5c** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.
- **NY-5.NBT.5** Fluently multiply multi-digit whole numbers using a standard algorithm.
- **NY-5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. Notes on and/or: Students should be taught to use strategies based on place value, the properties of operations, and the relationship between multiplication and division; however, when solving any problem, students can choose any strategy. Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy.

Pacing Notes

- 27 days
- 5 days for Lesson 0 included

Strategies and Models

Resources to review prior to instruction:
Found in Teacher Tool Box – Beginning of Unit

- Unit Flow and Progression
- Unit 1 Math Background

NYS Released Questions

- Grade 5 Released Questions

Assessments

- Lesson Quizzes / Digital Comprehension Checks
- End of Unit Assessment **Think Tech** (required)

Educator Notes

Grade 5
Unit 2: Decimals and Fractions: Place Value, Addition, and Subtraction

Skills and Standards

- **NY-5.NBT. 1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1 10 of what it represents in the place to its left.
- **NY-5.NBT.2** Use whole-number exponents to denote powers of 10. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.
- **NY-5.NBT.3** Read, write, and compare decimals to thousandths.
- **NY-5.NBT.3a** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. e.g., • 47.392 = 4 × 10 + 7 × 1 + 3 × **1 10** + 9 × **1 100** + 2 × **1 1000** • 47.392 = (4 × 10) + (7 × 1) + (3 × **1 10**) + (9 × **1 100**) + (2 × **1 1000**) • 47.392 = (4 × 10) + (7 × 1) + (3 × 0.1) + (9 × 0.01) + (2 × 0.001)
- **NY-5.NBT.3b** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
- **NY-5.NBT.4** Use place value understanding to round decimals to any place.
- **NY-5.NBT.7** Using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between operations:
  • add and subtract decimals to hundredths;
  • multiply and divide decimals to hundredths.
  Relate the strategy to a written method and explain the reasoning used.
- **NY-5.NF.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. e.g., • 1/3 + 2/9 = 3/9 + 2/9 = 5/9 • 2/3 + 5 / = 8 /2 + 5/ 12 = 23/12
- **NY-5.NF.2** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. e.g., using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
  e.g., Recognize an incorrect result 2/5 + 1/2 = 3/7 by observing that 3/7 < 1/2

Pacing Notes	Strategies and Models
• 35 Days	Resources to review prior to instruction: Found in Teacher Toolbox – Beginning of Unit • Unit Flow and Progression • Unit 2 Math Background
NYS Released Questions	**Assessments**
• Grade 5 Released Questions	• Lesson Quizzes /Digital Comprehension Check • Mid Unit Assessment (optional) • End of Unit Assessment **Think Tech** (required)

Educator Notes

Grade 5
Unit 3: More Decimals and Fractions: Multiplication and Division

Skills and Standards

- **NY-5.NBT.7** Using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between operations:
  • add and subtract decimals to hundredths;
  • multiply and divide decimals to hundredths. Relate the strategy to a written method and explain the reasoning used.
  Notes on and/or: Students should be taught to use concrete models and drawings; as well as strategies based on place value, properties of operations, and the relationship between operations. When solving any problem, students can choose to use a concrete model or a drawing. Their strategy must be based on place value, properties of operations, or the relationship between operations.
  Note: Division problems are limited to those that allow for the use of concrete models or drawings, strategies based on properties of operations, and/or the relationship between operations (e.g., 0.25 ÷ 0.05). Problems should not be so complex as to require the use of an algorithm (e.g., 0.37 ÷ 0.05)
- **NY-5.NF.3** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). e.g., Interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4 . Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. e.g., using visual fraction models or equations to represent the problem. e.g., If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?
- **NY-5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number or a fraction.
- **NY-5.NF.4a** Interpret the product a/b × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. e.g., Use a visual fraction model to show 2/3 × 4 = 8/3 , and create a story context for this equation. Do the same with 2/3 × 4/5 = 8/15
- **NY-5.NF.4b** Find the area of a rectangle with fractional side lengths by tiling it with rectangles of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
- **NY-5.NF.5** Interpret multiplication as scaling (resizing).
- **NY-5.NF.5a** Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. e.g., In the case of 10 x $\mathbf{1/2}$ = 5, 5 is half of 10 and 5 is 10 times larger than $\mathbf{1/2}$.
- **NY-5.NF.5b** Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case). Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. Relate the principle of fraction equivalence $\boldsymbol{a\ b} = \boldsymbol{a\ b} \times \boldsymbol{n\ n}$ to the effect of multiplying $a\ b$ by 1. e.g., Explain why 4 × $\mathbf{3}$ is greater than 4. Explain why 4 × $\mathbf{1}$ / is less than 4. $\mathbf{1}$ / is equivalent to $\mathbf{2}$ / because $\mathbf{1/3} \times \mathbf{2/2} = \mathbf{2}$.
- **NY-5.NF.6** Solve real world problems involving multiplication of fractions and mixed numbers. e.g., using visual fraction models or equations to represent the problem.
- **NY-5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
- **NY-5.NF.7a** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. e.g., Create a story context for 1 3 ÷ 4 and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 1/3 ÷ 4 = 1/12 because 1/12 × 4 = 1/3.
- **NY-5.NF.7b** Interpret division of a whole number by a unit fraction, and compute such quotients. e.g., Create a story context for 4 ÷ 1/5 and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ 1 5 = 20 because 20 × 1/5 = 4.
- **NY-5.NF.7c** Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions. e.g., using visual fraction models and equations to represent the problem. e.g., How much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3 -cup servings are in 2 cups of raisins? Note: Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement until grade 6 (NY-6. NS.1).

Pacing Notes	Strategies and Models
• 42 Days • 2 days for i-Ready Inform included	Resources to review prior to instruction: Found in Teacher Toolbox – Beginning of Unit • Unit Flow and Progression • Unit 3 Math Background
NYS Released Questions	**Assessments**
• Grade 5 Released Questions	• Lesson Quizzes / Digital Comprehension Checks • Mid Unit Assessment #1 (optional) • Mid Unit Assessment #2 (optional) • End of Unit Assessment **Think Tech** (required)

Educator Notes

Grade 5

Unit 4: Measurement, Data, and Geometry: Converting Units, Using Data, and Classifying Figures

Skills and Standards

- **NY-5.MD.1** Convert among different-sized standard measurement units within a given measurement system when the conversion factor is given. Use these conversions in solving multi-step, real world problems. Notes: • The known conversion factors from grade 4 include ft., in.; km, m, cm; hr., min., sec. and will not be given. All other conversion factors will be given. • Grade 5 expectations for decimal operations are limited to work with decimals to hundredths.
- **NY-5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit (1 2 , 1 4 , 1 8). Use operations on fractions for this grade to solve problems involving information presented in line plots. e.g., Given different measurements of liquid in identical beakers, make a line plot to display the data and find the total amount of liquid in all of the beakers.
- **NY-5.G.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. e.g., All rectangles have four right angles and squares are rectangles, so all squares have four right angles. Note: The inclusive definition of a trapezoid will be utilized, which defines a trapezoid as "A quadrilateral with at least one pair of parallel sides."
- **NY-5.G.4** Classify two-dimensional figures in a hierarchy based on properties.

Pacing Notes

- 20 days
- NY State Test Prep and Review

Strategies and Models

Resources to review prior to instruction:
Found in Teacher Toolbox – Beginning of Unit

- Unit Flow and Progression
- Unit 4 Math Background

NYS Released Questions

- Grade 5 Released Questions

Assessments

- Lesson quizzes / Digital comprehension Checks
- Mid Unit Assessment (optional)
- End of Unit Assessment **Think Tech** (required)

Educator Notes

Grade 5

Unit 5: Algebraic Thinking and the Coordinate Plane: Expressions, Graphing Points, Patterns and Relationships

Skills and Standards

- **NY-5.OA.1** Apply the order of operations to evaluate numerical expressions.
  e.g., • 6 + 8 ÷ 2
  • (6 + 8) ÷ 2
  Note: Exponents and nested grouping symbols are not included.
- **NY-5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. e.g., Express the calculation "add 8 and 7, then multiply by 2" as (8 + 7) × 2. Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.
- **NY-5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. e.g., Given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.
- **NY-5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond. e.g., x-axis and x-coordinate, y-axis and y-coordinate.
- **NY-5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Pacing Notes

- 22 Day days
- 2 days for i-Ready Inform included

Strategies and Models

Resources to review prior to instruction:
Found in Teacher Toolbox – Beginning of Unit

- Unit Flow and Progression
- Unit 5 Math Background

NYS Released Questions

- Grade 5 Released Questions

Assessments

- Lesson Quizzes / Digital Comprehension Checks
- End of Unit Assessment **Think Tech** (required)

Educator Notes