

5th Grade: Lauderdale County Schools: Math Syllabus 2024-2025

Last Updated on: 7/29/24

Review of 4th Grade Skills: AUGUST

5th Grade Preparedness Assessment: Do not use as a grade, only for data purposes

- **4.NBT.6:** Using Models and quantitative reasoning, explain that in a multi-digit whole number, a digit in any place represents ten times what it represents in the place to its right.
 - ◆ Howard County Public Schools
- **4.NBT.8:** Use place value understanding to compare two multi-digit numbers using $>$, $=$, and $<$ symbols.
 - ◆ Howard County Public Schools
- **4.NBT.9:** Round multi-digit whole numbers to any place using place value understanding. Use place value understanding and properties of operations to perform multi-digit arithmetic and whole numbers.
 - ◆ Howard County Public Schools
- **4.NF.18:** Use models and decimal notation to represent fractions with denominators of 10 and 100.
 - ◆ Howard County Public Schools
- **4.NF.19:** Use visual models and reasoning to compare two decimals to hundredths (referring to the same whole), recording comparisons using symbols $>$, $=$, and $<$, and justifying the conclusions.
 - ◆ Howard County Public Schools

Quarter 1: August-Mid October

Standards:

-AL.5.NBT.6: Fluently multiply multi-digit whole numbers using the standard algorithm

-Academic Vocabulary: multiply, multi-digit, standard algorithm, distributive property, partial products, area model, array

-AL.5.NBT.7: Use strategies based on place value, properties of operations, and/or the relationship between multiplication and division to find whole-number quotients and remainders with up to four-digit dividends and two-digit divisors. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

-Academic Vocabulary: quotient, dividend, divisor, divide, multiply, multiple, equation, remainder, area model, decompose, partial quotients, array

AL.5.OA.1: Write, explain, and evaluate simple numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving parentheses, brackets, or braces, using commutative, associative, and distributive properties.

-Academic Vocabulary: parentheses, expression, equation, evaluate, grouping symbols, order of operations, braces, brackets, calculate, interpret, compare, reason, equivalent.

-AL.5.NBT.3: Using models and quantitative reasoning, explain that in a multi-digit number, including decimals, a digit in any place represents ten times what it represents in the place to its right and $1/10$ of what it represents in the place to its left.

-AL.5.NBT.3a: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, using whole-number exponents to denote powers of 10.

-Academic Vocabulary: digit, place value, power of ten

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-AL.5.NBT.3b: Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10, using whole-number exponents to denote powers of ten.

-Academic Vocabulary: product, multiply, divide, power of 10, decimal, decimal point, exponent, append, factor, base, expression, place value

-AL.5.NBT.4: Read, write, and compare decimals to thousandths.

-AL.5.NBT.4a: Read and write decimals to thousandths using base-ten numerals, number names, and expanded form.

-Academic Vocabulary: decimal, thousandths, hundredths, tenths, base-ten, expanded form, place value, power of 10, product, standard form

-AL.5.NBT.4b: Compare two decimals to thousandths based on the meaning of the digits in each place using $>$, $<$, or $=$ to record the results of comparisons.

-Academic Vocabulary: compare, decimal, thousandths, hundredths, tenths, symbol, greater than, less than, equal, place value strategies

-AL.5.NBT.5: Use place value understanding to round decimals to thousandths.

-Academic Vocabulary: round, place value, tenths, hundredths, thousandths, decimal, number line

-AL.5.NBT.8: Add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationships between addition/subtraction and multiplication/division; relate the strategy to a written method, and explain the reasoning used.

-AL.5.NBT.8a: Use concrete models and drawings to solve problems with decimals to hundredths.

-Academic Vocabulary: add, subtract, multiply, divide, decimal, tenths, hundredths, operation, hundred grid

-AL.5.NBT.8ab: Solve problems in a real-world context with decimals to hundredths.

-Academic Vocabulary: add, subtract, multiply, divide, decimal tenths, hundredths, operation hundred grid

This standard will roll over into Quarter 2

Approved Supplements & Resources:

Howard County Public Schools
Math in Practice
Math by the Book
Illustrative Mathematics
AMSTI

Eureka

Module 2

Topic A: Lesson 1, 2: AL.5.NBT.6 Mental Strategies for Multi-Digit Whole Number

Parent Resources

Support Videos:

[Decimal Place Value](#)

[Adding Decimals](#)

[Subtracting Decimals](#)

[Powers of Ten](#)

[Algebraic Thinking](#)

[Multi-Digit Multiplication & Division](#)

[Multiply Decimals](#)

[Divide Decimals](#)

Strategy Support:

[-Progression Videos | Questioning My Metacognition-](#) watch Multiplication Video and Division Video (5-7 min videos)

[Connecting Open Area Model to U.S. Standard Algorithm:](#) This is a GREAT activity to do with your

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Multiplication.

-Makes connections to 4th grade models before introduction to the U.S. standard algorithm.

Topic B: Lessons 3-6, 9: AL.5.NBT.6

The Standard Algorithm for Multi-Digit Whole Number Multiplication

Topic E: Lessons 16-18: AL.5.NBT.7

Mental Strategies for Multi-Digit Whole Number Division

Topic F: Lesson 19-23: AL.5.NBT.7

Partial Quotients and Multi-Digit Whole Number Division

-The U.S. Standard algorithm should NOT be formally taught. That is a sixth grade standard. Strategies that promote base ten reasoning such as partial quotients and open area models should be used.

****5.OA.1: Use one of the approved supplemental resources to cover this standard. 5-7 days allotted for pacing.**

Module 1

Topic A: Lessons 1-4: AL.5.NBT.3

Multiplicative Patterns on the Place Value Chart

Topic B: Lessons 5-6: AL.5.NBT.3, AL.5.NBT.4 Fractions and Place Value Patterns

Topic C: Lessons 7-8: AL.5.NBT.5

Place Value and Rounding Decimal Fractions

class as you transition from using partial products and the open area model to the US Standard Algorithm.

Partial Quotients- honors place value- standard algorithm is a 6th grade standard.

Base Ten Strategies for Decimal Operations:

Addition/Subtraction with 100s grids

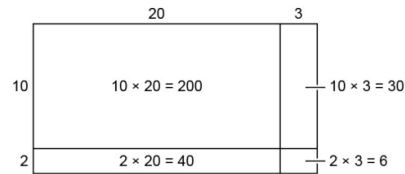
Multiplication: tenth x tenth using 100s grid

Multiplication: Mixed decimal x tenth

Multiplication: Mixed x mixed area model

Division: Partial Quotients

Division: Base Ten Blocks



Multiplication: Partial Products Algorithm

In this algorithm, we break apart the numbers by place value to find parts of the product. We add them back together to get the final product. This algorithm begins in the **ones** place.

$$\begin{array}{r} 48 \\ \times 32 \\ \hline 16 \quad \leftarrow (2 \times 8) \\ 80 \quad \leftarrow (2 \times 40) \\ 240 \quad \leftarrow (30 \times 8) \\ + 1200 \quad \leftarrow (30 \times 40) \\ \hline 1,536 \end{array}$$

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Topic D: Lessons 9-10: AL.5.NBT.8
Adding and Subtracting Decimals

Topic E: Lessons 11-12: AL.5.NBT.8
Multiplying Decimals

Topic F: Lessons 13-16: AL.5.NBT.8
Dividing Decimals

Multiplication: Traditional Algorithm

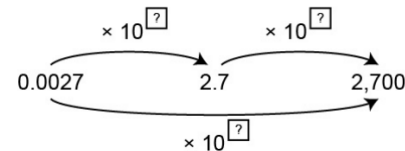
This is a digit-based algorithm. It is useful for multiplying large numbers. We begin in the ones place and proceed to multiply each digit. We combine products of each place value.

$$\begin{array}{r}
 48 \\
 \times 32 \\
 \hline
 96 \leftarrow (2 \times 8) + (2 \times 40) \\
 + 1440 \leftarrow (30 \times 8) + (30 \times 40) \\
 \hline
 1,536
 \end{array}$$

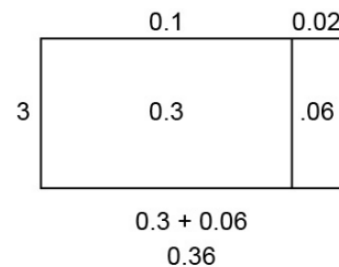
Base Ten Models for Place Value:

	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths
6.23				6	. 2	3
6.23×10			6	2	. 3	0
6.23×100		6	2	3	. 0	0
$6.23 \times 1,000$	6	2	3	0	. 0	0

Given the number pattern 0.0027, 2.7, 2,700, . . . , identify that each term is multiplied by 1000 to obtain the subsequent term.

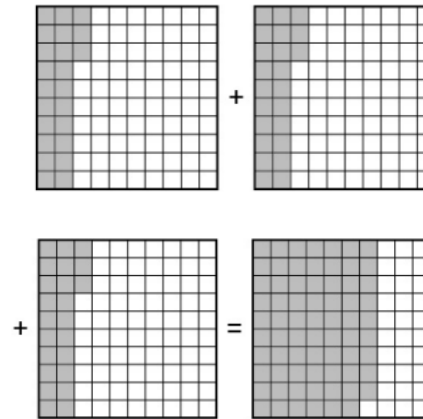


0.12×3 See Area Model Below



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Interpret the model as either $0.23 + 0.23 + 0.23 = 0.69$ or $3 \times 0.23 = 0.69$

Click on the image below for an activity on dividing decimals with base ten blocks.

Dividing Decimals with Base Ten Blocks

Materials: base ten blocks (optional)

I. Work with a partner. Use base ten blocks to model each problem below:

- a) $1.6 \div 0.4$ b) $2.8 \div 0.7$ c) $3.6 \div 0.9$ d) $3.2 \div 0.8$
e) $0.2 \div 0.04$ f) $0.4 \div 0.08$ g) $0.16 \div 0.08$ h) $0.7 \div 0.01$

Example: $1.2 \div 0.6$



Think: How many 0.6 are in 1.2?
There are 2 groups of 0.6.
So, $1.2 \div 0.6 = 2$

Example: $0.3 \div 0.02$



Think: How many 0.02 are in 0.3?
There are 15 groups of 0.02.
So, $0.3 \div 0.02 = 15$

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Quarter 2: Mid October-December

-AL.5.NBT.8: Add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationships between addition/subtraction and multiplication/division; relate the strategy to a written method, and explain the reasoning used.

-AL.5.NBT.8a: Use concrete models and drawings to solve problems with decimals to hundredths.

-Academic Vocabulary: add, subtract, multiply, divide, decimal, tenths, hundredths, operation, hundred grid

-AL.5.NBT.8ab: Solve problems in a real-world context with decimals to hundredths.

-Academic Vocabulary: add, subtract, multiply, divide, decimal tenths, hundredths, operation hundred grid

AL.5.M.17: Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.

-Academic Vocabulary: measurement system, unit, conversion, multiplication, division, equivalent measurements, metric system, US Customary system

AL.5.NF.9: Model and solve real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, 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.

-Academic Vocabulary: fraction, denominator, numerator, addition, subtraction, visual model, equivalent fractions, equation, mixed number, benchmark fractions

AL.5.NF.10: Add and subtract fractions and mixed numbers with unlike denominators, using fraction equivalence to calculate a sum or difference of fractions or mixed numbers with like denominators.

-Academic Vocabulary: fraction, denominator, numerator, addition, subtraction, visual model, equivalent fractions, equation, mixed numbers

AL.5.G.21: Classify triangles according to side length (isosceles, equilateral, scalene) and angle measure (acute, obtuse, right, equiangular).

-Academic Vocabulary: isosceles, equilateral, scalene, acute, obtuse, right, equiangular, degree, protractor

AL.5.G.22: Classify quadrilaterals in a hierarchy based on properties

-Academic Vocabulary: two-dimensional, properties

AL.5.G.23: Explain that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

-Academic Vocabulary: attribute, subcategory, two-dimensional, figure, right angle, parallel, perpendicular

AL.5.G.20: Graph points in the first quadrant of the coordinate plane, and interpret coordinate values of points to represent real-world and mathematical problems.

-Academic Vocabulary: coordinate system, coordinate, x-axis, y-axis, origin, ordered pair, plane, horizontal, vertical, coordinate plane, first quadrant

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AMSTI

Eureka

Module 2
Topic C: Lessons 10-12: AL.5.NBT.8
Decimal Multi-Digit Multiplication

Module 2
Topic G Lessons 24-27: AL.5.NBT.8:
Partial Quotients and Multi-Digit
Decimal Division

****The standard algorithm for division is taught in these lessons, therefore the numbers are too large to use models. Use smaller numbers to teach dividing decimals using hundreds grids or base ten blocks****

Topic D: Lesson 13-15: AL.5.M.17, AL.5.NBT.6, AL.5.NBT.8
Measurement Word Problems with Whole Number and Decimal Multiplication

Topic H Lessons 28-29: AL.5.NBT.7, AL.5.M.17, AL.5.NBT.8: Measurement Word Problems with Multi-Digit Division

Parent Resources

Support Video:

[Decimal Multiplication](#)

[Measurement Conversions](#)

[Multi-Digit Division](#)

[Adding Fractions/Subtracting Fractions](#)

[Shapes](#)

Manipulatives/Models to support learning:

-Cuisenaire Rods

-Pattern Blocks

-Number Lines

-Various 2-D shape cutouts

-Grid Paper

-Battleship Board Game (coordinate systems)

Strategy Support:

[Fraction Operations](#)

[Converting Mixed Numbers to Fractions to Mixed Numbers](#)

[Classifying Polygons](#)

Check with Library Media Specialists about coding robots.

Ask students to locate points on a coordinate plane in relation to other points already mapped. For example, "In a computer game, a programmer places villages on a coordinate plane at points (5, 2) and (9, 8)." Students determine that the location of a bridge that is exactly halfway between the villages is (7, 5).

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Module 3

Topic A Lessons 1-2:

AL.5.NF.10: Equivalent Fractions

Topic B Lessons 3-7: **AL.5.NF.9,**

AL.5.NF.10: Making Like Units Pictorially

Topic C Lessons 8-12: **AL.5.NF.9,**

AL.5.NF.10: Making Like Units Numerically

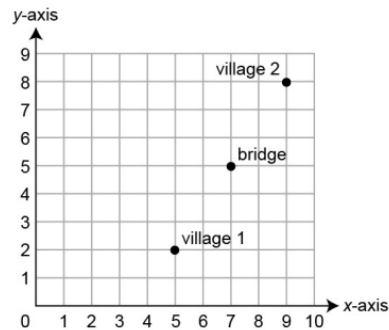
Module 5

Topic D Lessons 16-20: **AL.5.G.22,**

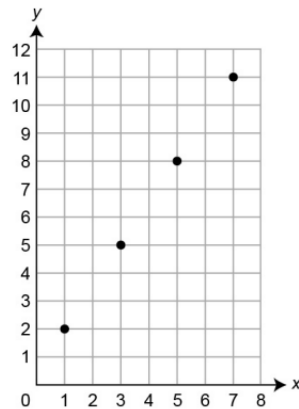
AL.5.22.23: Drawing, Analyzing, and Classification of Two-Dimensional Shapes

4th Grade Module 4 Topic D Lessons

13-14: AL.5.G.21: Drawing, Analyzing, and Classification of Triangles



Ask students to determine the relationship between corresponding terms in a set of coordinate pairs and describe the pattern that appears when the pairs are graphed on a coordinate plane as points. For example, given the ordered pairs (1, 2), (3, 5), (5, 8), and (7, 11), observe that the difference between the corresponding numbers is not the same for each coordinate pair but progresses in a pattern of 1, 2, 3, 4, and the points fall in a straight line on the graph.



Set up the classroom as a grid system and have students write directions to “pass a note” to another classmate.

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Quarter 3: January-Mid March

AL.5.OA.2: Generate two numerical patterns using two given rules and complete an input/output table for the data.

AL.5.OA.2a: Use data from an input/output table to identify apparent relationships between corresponding terms.

-Academic Vocabulary: number pattern, generate, sequence, input, output

AL.5.G.20: Graph points in the first quadrant of the coordinate plane, and interpret coordinate values of points to represent real-world and mathematical problems.

-Academic Vocabulary: coordinate system, coordinate, x-axis, y-axis, origin, ordered pair, plane, horizontal, vertical, coordinate plane, first quadrant

AL.5.DA.16: Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$).

AL.5.DA.16a: Add, subtract, multiply, and divide fractions to solve problems involving information presented in line plots. *NOTE: Division is limited to unit fractions by whole numbers and whole numbers by unit fractions.*

-Academic Vocabulary: line plot, frequency, fraction, operation, data, number line, fractional intervals

AL.5.NF.11: Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.

AL.5.NF.11a: Model and interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$).

AL.5.NF.11b: Use visual fraction models, drawings, or equations to represent word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.

-Academic Vocabulary: fraction, numerator, denominator, division, remainder, dividend, divisor

AL.5.NF.12: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

AL.5.NF.12a: Use a visual fraction model (area model, set model, or linear model) to show $(a/b) \times q$ and create a story context for this equation to interpret the product as a part of a partition of q into b equal parts.

AL.5.NF.12b: Use a visual fraction model (area model, set model, or linear model) to show $(a/b) \times (c/d)$ and create a story context for this equation to interpret the product.

-Academic Vocabulary: fraction, fraction model, whole number, multiplication, division, numerator, denominator, product, equation, expression

AL.5.NF.12c: Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

-Academic Vocabulary: rectangle, area, length, width, fraction, decomposing

**Approved
Supplements &
Resources:**

Howard County Public Schools

Parent Resources

Support Video:

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Math in Practice
Math by the Book
Illustrative Mathematics
AMSTI

Eureka

Module 6
Topic A Lessons 1-5: AL.5.G.20:
Coordinate System

Module 6
Topic B Lessons 6-12: 5.OA.2,
5.G.20: Patterns in the Coordinate
Plane and Graphing Number Patterns
from Rules

Module 4
Topic A Lesson 1: 5.DA.16 Measure
and compare pencil lengths to the
nearest $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ of an inch, and
analyze the data through line plots.

Topic B Lessons 2-5: 5.NF.11,
5.NF.11a, 5.NF.11b: Fractions as
Division

Topic C Lessons 6-9: 5.NF.12,
5.NF.13, 5.NF.14: Multiplication of a
Whole Number by a Fraction

Topic D Lessons 10-12: 5.OA.1,
5.NF.9, 5.NF.10, 5.NF.12, 5.NF.14:
Fraction Expressions and Word
Problems

Topic E Lessons 13-16: 5.NF.12,
5.NF.14: Multiplication of a fraction by a

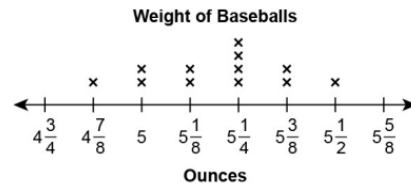
[Coordinate Planes](#)
[Line Plots](#)
[Dividing Fractions](#)
[Multiplying Fractions](#)

Manipulatives/Models to Support Learning:

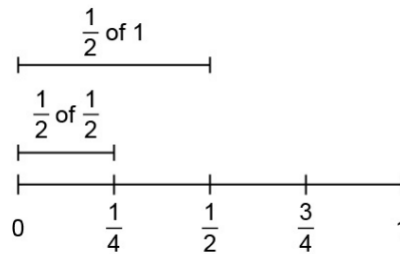
- pattern blocks
- Cuisenaire rods
- Number lines
- Fraction Overlays

Strategy Support:

How can information about data presented in line plots be determined using the four operations?



Ask students to locate $\frac{1}{2}$, and then ask them to locate $\frac{1}{2}$ of $\frac{1}{2}$.



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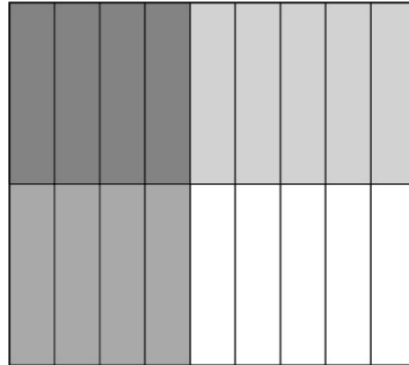
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fraction

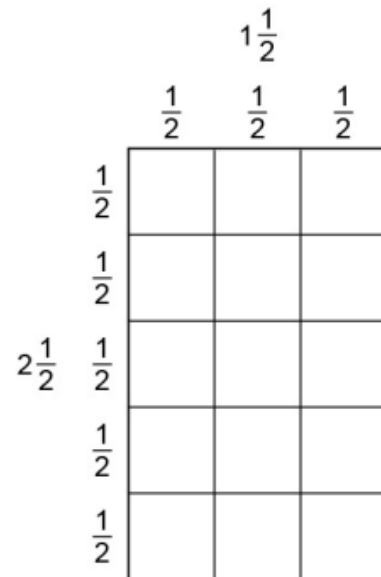
Module 5

Topic C: Lessons 10-15: 5.NF.12:

Area of Rectangular Figures with Fractional Side Lengths



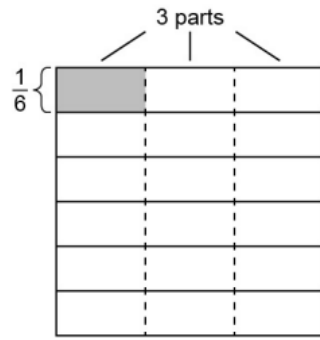
Interpret the model as $\frac{4}{9} \times \frac{1}{2}$ or $\frac{1}{2} \times \frac{4}{9} = \frac{4}{18}$ or $\frac{2}{9}$



Scaling - For example, just as the equation $2 \times 3 = 6$ indicates that 6 is 3 times as great as 2, the equation $2 \times 3 \cdot 2 = 3$ indicates that 3 is $3 \cdot 2$ (i.e., 1.5) times as great as 2

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Ask students to use visual models to explain why dividing by a nonzero whole number is equivalent to multiplying by its unit fraction. For example, ask students to compare $\frac{1}{6} \div 3$ and $\frac{1}{6} \times \frac{1}{3}$. The first expression starts with $\frac{1}{6}$ of a whole and divides it into 3 equal portions, as shown. This is only one example or model. Look at other models in your ACAP supports

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Quarter 4: Mid March-May

AL.5.NF.13: Interpret multiplication as scaling (resizing).

AL.5.NF.13a: 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. *Example: Use reasoning to determine which expression is greater 225 of $\frac{3}{4} \times 225$; $\frac{11}{50}$ or $\frac{3}{2} \times \frac{11}{50}$*

AL.5.NF.13b: Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and relate the principle of fraction equivalence.

AL.5.NF.13c: Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number and relate the principle of fraction equivalence.

-Academic Vocabulary: factor, product, resizing, scaling, equivalent, equation

AL.5.NF.14: Model and solve real-world problems involving multiplication of fractions and mixed numbers using visual fraction models, drawings, or equations to represent the problem.

-Academic Vocabulary: fraction, mixed number, multiplication

AL.5.NF.15: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

AL.5.NF.15a: Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions and illustrate using visual fraction models, drawings, and equations to represent the problem.

AL.5.NF.15b: Create a story context for a unit fraction divided by a whole number, and use a visual fraction model to show the quotient.

AL.5.NF.15c: Create a story context for a whole number divided by a unit fraction, and use a visual fraction model to show the quotient.

-Academic Vocabulary: unit fraction, whole number, division, multiplication, fraction model, number line, fractional pieces

AL.5.M.18: Identify volume as an attribute of solid figures, and measure volumes by counting unit cubes, cursing cubic cm, cubic in, cubic ft, and improvised (non-standard) units.

AL.5.M.18a: Pack a solid figure without gaps or overlaps using n unit cubes to demonstrate volume as n cubic units.

-Academic Vocabulary: volume, space, cube, unit cube, three-dimensional, cubic unit, attribute, solid figure, cubic centimeters, cubic inches, cubic feet

Review 5th grade standards until the end of the school year.

Approved Supplements & Resources:

Howard County Public Schools
Math in Practice
Math by the Book
Illustrative Mathematics

Parent Resources

Video Support:
[Volume](#)

Manipulatives/Models to Support Learning:
-number lines
-fraction models

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AMSTI

Eureka

Module 4

Topic D: Lessons 22-23: 5.NF.13

Lessons 22–23: Compare the size of the product to the size of the factors. See Howard County resources as a more quality lesson relating multiplication to scaling.

<https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-5-about-the-math-learning-targets-and-rigor>

Topic G Lessons 25-28: 5.NF.15:
Division of Fractions

Topic H Lesson 32: 5.OA.1, 5.NF.15:
Interpretation of Numerical Expressions with Fraction Division

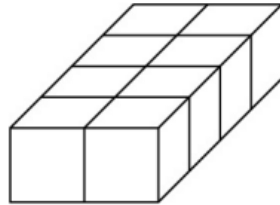
Module 5

Topic A: Lessons 1-3 5.M.18:
Concepts of Volume

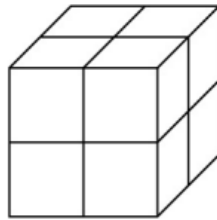
Topic B: Lessons 4-7: 5.M.19:
Volume and the Operations of Multiplication and Addition

- pattern blocks
- patty paper
- rectangular prisms to pack cubes in
- centimeter cubes
- unifix cubes

Do students understand a volume of 8 cubes can look differently?



The volume is 8 cubic units.



The volume is also 8 cubic units.

Do students understand two different equations or ways to determine volume?

$$V = l \times w \times h$$

$$V = B \times h$$

Volume with two non overlapping rectangular prisms.

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