

MOBILE COUNTY PUBLIC SCHOOLS
 DIVISION OF CURRICULUM & INSTRUCTION
 FIFTH GRADE MATHEMATICS INSTRUCTIONAL PLANNING
 2017-2018: QTR 4

Qtr. 4: Weeks 1-3
 March 20 – April 12 (13 Days)
 Grade 5 , Unit 10 Volume

UNIT OVERVIEW: UNDERSTAND CONCEPTS OF VOLUME AND RELATE VOLUME TO MULTIPLICATION AND TO ADDITION

Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems

ESSENTIAL QUESTIONS:

- How do we measure volume?
- How are area and volume alike and different?
- How can you find the volume of cubes and rectangular prisms?
- What is the relationship between the volumes of geometric solids?
- Why are some tools better to use than others when measuring volume?
- Why is volume represented with cubic units and area represented with square units?

KEY VOCABULARY:

measurement, attribute, volume, solid figure, right rectangular prism, unit, unit cube, gap, overlap, cubic units (cubic cm, cubic in., cubic ft., nonstandard cubic units), multiplication, addition, edge lengths, height, area of base (base area)

Basic Fact Assessment: Multiplication (factors 0-12) & Division (divisors 0-12 & quotients 0-12) - Mixed

Standards/Objectives

Mastery Standards

Standards Clarification

[5-MD.3a] Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

- a. 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.

[5-MD.3a] Understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume.

[5-MD.3b] Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

- b. 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.

[5-MD.3b] Volume as an attribute of solid figures.

[5-MD.4] Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.

[5-MD.4] Measure volume in various units

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<p>[5-MD.5a] Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>a. 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. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.</p>	<p>[5-MD.5a] Find volume of right rectangular prism using cubes, discover formula, associative property.</p>
<p>[5-MD.5b] Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ 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.</p>	<p>[5-MD.5b] Apply formula for volume with whole # and in real-life situations.</p>
<p>[5-MD.5c] Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>c. 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.</p>	<p>[5-MD.5c] Recognize volume as additive (multiple non-overlap containers) real-life.</p>

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Resources for Quarter 3 Unit 10

<p>Engage New York Module 5 Topics A, B – (MD3, MD4, MD5) https://www.engageny.org/resource/grade-5-mathematics-module-5</p>	<p>Georgia Standards Unit 6 – (MD3, MD4, MD5a,b,c) https://www.georgiastandards.org/Georgia-Standards/Frameworks/5-Math-Unit-6.pdf</p>	<p>Howard County (MD3) https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-3-assessment-tasks (MD4) https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-4-assessment-tasks (MD5a, MD5b, MD5c) https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-5-assessment-tasks</p>	<p>Math In Focus Chapter 15 – (MD3, MD4, MD5)</p>
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Xtra Math <https://xtramath.org/#/home/index> *Free, individualized web based program that helps to build student fluency.*

Focus Standards for Mathematical Practice

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.

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Qtr. 4: Weeks 4-6

April 13 – May 2 (14 days)

Grade Level 5, Unit 11: Divide Fractions by Fractions and whole numbers

UNIT OVERVIEW: APPLY & EXTEND PREVIOUS UNDERSTANDING OF MULTIPLICATION & DIVISION

Students continue to develop this concept by using visual models and equations to divide whole numbers by fractions and fractions by fractions to solve word problems. Students develop an understanding of the relationship between multiplication and division. Students become fluent in the use of the standard division algorithm, continuing to use their understanding of place value to describe what they are doing. **Place value has been a major emphasis in the elementary standards. This standard is the end of this progression to address students' understanding of place value.**

ESSENTIAL QUESTIONS:

- How do you divide a whole number by a fraction?
- Why does the process of invert and multiply work when dividing fractions?
- When I divide a fraction by a fraction what do the dividend, quotient and divisor represent?
- Which strategies are helpful when dividing multi-digit numbers?
- Which strategies are helpful when performing operations on multi-digit decimals?

KEY VOCABULARY:

reciprocal, multiplicative inverses, visual fraction model, multi-digit

Basic Fact Assessment: Multiplication (factors 0-12) & Division (divisors 0-12 & quotients 0-12) - Mixed

Standards/Objectives

Mastery Standards

Standards Clarification

[5-NF.6] Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

[5-NF.6] Solve real-world problems with multiplying fraction or whole by fraction with equations.

[5-NF.7a] Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

[5.NF.7a] Divide unit fraction by whole number **(with story context)**.

- a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.
 - For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.

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<p>[5-NF.7b] Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p> <p>b. Interpret division of a whole number by a unit fraction, and compute such quotients.</p> <ul style="list-style-type: none"> For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. 	<p>[5-NF.7b] Divide whole number by unit fraction (with story context).</p>
<p>[5-NF.7c] Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p> <p>a. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole by unit fractions, e.g. by using visual fraction models and equations to represent the problem.</p> <ul style="list-style-type: none"> For example, how much chocolate will each person get if 3 people share $1/2$ lb. of chocolate equally? How many $1/3$ cup servings are 2 cups of raisins? 	<p>[5-NF.7c] Dividing fraction word problems.</p>
<p>Mastery Standards in 6th Grade</p>	<p>Standards Clarification</p>
<p>[6-NS.1] Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.</p> <ul style="list-style-type: none"> For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$-cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi? 	<p>[6-NS.1] Interpret and compute quotients of fractions by fractions.</p>
<p>[6-NS.2] Fluently divide multi-digit numbers using the standard algorithm.</p>	<p>[6-NS.2] Fluently divide multi-digit numbers using the standard algorithm.</p>
<p>[6-NS.3] Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p>	<p>[6-NS.3] Fluently add, subtract, multiply, and divide multi-digit decimals using standard algorithms.</p>
<p>These 6th grade standards have been moved to 5th grade in order to facilitate preparation for success in Algebra I of future MCPSS 8th grade students.</p>	

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Opportunity for Depth Standards		Standards Clarification	
[5-OA.1] Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.		[5-OA.1] Evaluate expressions w/ parentheses, brackets, braces.	
[5-OA.2] Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.		[5-OA.2] Write expressions connected to calculations, interpret expressions w/o evaluating.	
Additional Standards		Standards Clarification	
[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.		[5-OA.3] Generate patterns with two rules (i.e. $x + 2$) and identify relationships between corresponding terms.	
Resources for Quarter 4 Unit 11			
<p>Engage New York Module 4 – (NF6, NF7) https://www.engageny.org/resource/grade-5-mathematics-module-4</p> <p>6th Grade Module 2 Topics A, B, C – (6.NS.1, 6.NS.2, 6.NS.3) https://www.engageny.org/resource/grade-6-mathematics-module-2</p>	<p>Georgia Standards Unit 1 – (OA1, OA2) https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-1.pdf</p> <p>Unit 4 – (NF6, NF7) https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-4.pdf</p> <p>6th Grade Unit 1 – (NS1, NS2, NS3) https://www.georgiastandards.org/Georgia-Standards/Frameworks/6th-Math-Unit-1.pdf</p>	<p>Illustrative Math – (6.NS.1, 6.NS.2, 6.NS.3) https://www.illustrativemathematics.org/NS</p> <p>Howard County (NF6) https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-6-about-the-math-learning-targets-and-rigor (NF7) https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-7-assessment-tasks (OA1) https://hcpss.instructure.com/courses/108/pages/5-dot-oa-dot-1-assessment-tasks</p>	<p>Math In Focus Chapter 4 Lessons 6 and 7 – (NF6, NF7) Chapter 5 Lesson 1 – (OA1, OA2)</p>

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<p>FAL: <u><i>Interpreting Multiplication and Division</i></u> – (NS1) http://map.mathshell.org/lessons.php?unit=6115&collection=8</p>	<p>FAL: <u><i>Interpreting Multiplication and Division</i></u> – (NS1) http://map.mathshell.org/lessons.php?unit=6115&collection=8</p>	<p>(OA2) https://hcpss.instructure.com/courses/108/pages/5-dot-0a-dot-2-assessment-tasks</p> <p>FAL: <u><i>Interpreting Multiplication and Division</i></u> – (NS1) http://map.mathshell.org/lessons.php?unit=6115&collection=8</p>	<p>FAL: <u><i>Interpreting Multiplication and Division</i></u> – (NS1) http://map.mathshell.org/lessons.php?unit=6115&collection=8</p>
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<p>MP.7 Look for and make use of structure.</p>			
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Qtr. 4: Weeks 7-9

May 3 – May24 (16 days)

Grade Level 5, Unit 12: Divide Fractions by Fractions and whole numbers

UNIT OVERVIEW: APPLY & EXTEND PREVIOUS UNDERSTANDING OF MULTIPLICATION & DIVISION TO DIVIDE FRACTIONS BY FRACTIONS AND STANDARD DIVISION ALGORITHM

Students continue to develop this concept by using visual models and equations to divide whole numbers by fractions and fractions by fractions to solve word problems. Students develop an understanding of the relationship between multiplication and division. Students become fluent in the use of the standard division algorithm, continuing to use their understanding of place value to describe what they are doing. **Place value has been a major emphasis in the elementary standards. This standard is the end of this progression to address students’ understanding of place value.**

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<p>[5-NF.7b] Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p> <p>b. Interpret division of a whole number by a unit fraction, and compute such quotients.</p> <ul style="list-style-type: none"> For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. 	<p>[5-NF.7b] Divide whole number by unit fraction (with story context).</p>
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