Westside Consolidated School District <mark>updated 1/29/15</mark>
Common Core State Standards
Curriculum Guide for Grade 5 Mathematics

Grade 5 Overview

- **Operations and Algebraic Thinking**
  - o Write and interpret numerical expressions.
  - o Analyze patterns and relationships --- *generate 2 numerical patterns using 2 given rules; form ordered pairs from the 2 patterns; graph the ordered pairs on a coordinate plane (first quadrant).*
- **Number and Operations in Base Ten**
  - o Understand the place value system – *read/write/compare decimals to <u>thousandths</u>.*
  - o Perform 4 operations (+, -, x, /) with multi-digit whole numbers and with *decimals to <u>hundredths</u>.*
- **Number and Operations- Fractions**
  - o Use equivalent fractions as a strategy to add and subtract fractions – *add and subtract with <u>unlike</u> denominators.*
  - o Apply and extend previous understandings of multiplication and division to multiply and divide fractions –
     Note: *Division is limited to dividing unit fractions by whole numbers and whole numbers by unit fractions; division of a fraction by a fraction is <u>not</u> a requirement at grade 5.*
- **Measurement and Data**
  - o Convert like measurement units within a given measurement system.
  - o Represent and interpret data – *use line plots to display a data set of measurements in fractions of a unit (½, ¼, ⅛).*
  - o Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition –-
     a cube with side length 1 unit is called a unit cube *and can be used to measure volume; apply the formulas:* $V = l \times w \times h$; $V = b \times h$.
- **Geometry**
  - o Graph points on the coordinate plane to solve real-world and mathematical problems -- *first quadrant.*
  - o Classify two-dimensional figures into categories based on their properties.

Resources:
Textbook Series: enVision Math, □ 2009, Scott Foresman-Addison Wesley

<u>Investigations in Number, Data, and Space</u>, **Pearson Publishing**
 Investigations and the Common Core State Standards in Math Home Page*:* http://investigations.terc.edu/components/CCSS/CommonCore.cfm
 Math Common Core State Standards Kindergarten Correlation: http://investigations.terc.edu/library/common_core/GK_InvCCSS_Corr.pdf

The Common Core State Standards Home Page: http://www.corestandards.org/

The Common Core State Standards for Mathematics: http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

CCSS: Standards for Mathematical Practice

1. **Make sense of problems and persevere in solving them.**

2. **Reason 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.**

CCSS: Mathematics   K – 8 Domains

Domains		K	1	2	3	4	5	6	7	8
Counting and Cardinality	**CC**									
Operations and Algebraic Thinking	**OA**				30-35%	12-17%	5-10%			
Number and Operations in Base Ten	**NBT**				5-10%	22-27%	22-27%			
Measurement and Data	**MD**				22-27%	12-17%	10-15%			
Geometry	**G**				10-15%	12-17%	2-7%	12-17%	22-27%	20-25%
Number and Operations -- Fractions	**NF**				20-25%	27-32%	47-52%			
Ratios and Proportional Relationships	**RP**							12-17%	22-27%	
The Number System	**NS**							27-32%	7-12%	2-7%
Expressions and Equations	**EE**							27-32%	22-27%	27-32%
Statistics and Probability	**SP**							7-12%	12-17%	15-20%
Functions	**F**									22-27%

5th Grade Mathematics • Unpacked Content

At A Glance: Comparing the new *Common Core State Standards* to the old *Arkansas Frameworks*

This page provides a snapshot of the mathematical concepts that are NEW or have been MOVED from this grade level.

NEW to 5th Grade:
Patterns in zeros when multiplying (**5.NBT.2**)
Extend understandings of multiplication and division of fractions   (**5.NF.3, 5.NF.4, 5.NF.5, 5.NF.7**)
Conversions of measurements within the same system   (**5.MD.1**)
Volume (**5.MD.3, 5.MD.4, 5.MD.5**)
Coordinate System   (**5.G.1, 5.G.2**)
Two-dimensional figures – hierarchy   (**5.G.3, 5.G.4**)
Line plot to display a data set of measurements in fractions of a unit   (**5.MD.2**)

MOVED from 5th Grade:
Estimate measure of objects from one system to another system
Measure of angles
Describe triangles and quadrilaterals
Angles, diagonals, parallelism and perpendicularity
Symmetry - line and rotational
Data - stem-and-leaf plots, different representations, median, range, and mode
Constant and varying rates of change

Note:
For more information on deconstructed standards and performance based assessments visit ccstudio.org

Directions:

This is a live document that will be the foundation for math instruction. The next four pages outline what should be taught during each nine-week period for Common Core Standards and vocabulary as a pacing guide. The fifth page is all of the nine-week periods on one page for all the information at-a-glance.

The Pacing Guide- In the last columns write in the Topic and lesson number from envisionMATH 2011 edition. This will allow you to decide what Topics best fit the standard. You can also add the Big Ideas if you would like to. Add any more information as necessary. Since this is a working document, feel free to make comments for adjustments in the future.

The At-A-Glance - Add page numbers, Topics, or lesson numbers next to the standard listed. At the bottom of each nine-weeks section list any projects, resources, or manipulatives to supplement the text.

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment *enVision Math Common Core©2011*	Resources/ Lit Connections
Number and Operations in Base Ten *-- Read/ Write/ Compare Decimals to Thousandths* *- Add/ Subtract/ Multiply/ Divide Decimals to Hundredths*	**5.NBT.1**	**Understand the place value system.** ● **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. ➢ Place Value ➢ Evaluate the value of a digit ➢ Read, write, compare decimals to <u>thousandths</u> ➢ Represent decimals and whole numbers in different ways ➢ Comparing and ordering decimals	**5.NBT.1** **Topic 1:** Place Value	

5. NBT.2
 	
5. NBT.3
	• **5. NBT.2** 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. Use whole-number exponents to denote powers of 10.
	• **5. NBT.3:** Read, write, and compare decimals to thousandths.
	    ➢ a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form,
	    ➢ e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
	    ➢ b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	
	Continue on next page…	

5.NBT.4	● **5. NBT.4** Use place value understanding to round decimals to any place.	**5.NBT.4; 5.NBT.7** **Topic 2:** Adding & Subtracting Decimals
5.NBT.5 **5.NBT.6**	**Perform operations with multi-digit whole numbers and with decimals to hundredths.** ● **5. NBT.5** – Fluently multiply multi-digit whole numbers using the standard algorithm. ● **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 & explain by using equations, rectangular arrays, and/or area models.	**5.NBT.5; 5.NBT.6** **Topic 3:** Multiplying Whole Numbers **Topic 4:** Dividing by 1-Digit Divisors **Topic 5:** Dividing by 2-Digit Divisors
5.NBT.7	● **5. NBT.7** – <u>Add, subtract</u>, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the <u>relationship between addition and subtraction</u>. Relate the strategy to a written method and explain the reasoning used. ** underlined section completed 1ˢᵗ nine-weeks	**5.NBT.7** **Topic 2:** <u>Adding & Subtracting Decimals</u> **Topic 6:** Multiplying Decimals **Topic 7:** Dividing Decimals

Westside Consolidated School District   *Common Core State Standards* – Mathematics   5th Grade Pacing Guide
<mark>**2nd Nine Weeks**</mark>

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment *enVision Math Common Core©2011*	Resources/ Lit Connections
Number and Operations in Base Ten	**5.NBT.7**	**5. NBT.7** – Add, subtract, <u>multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Relate the strategy to a written method and explain the reasoning used</u>. **** underlined section completed 2nd nine-weeks**	**Topic 6:** <u>Multiplying Decimals</u> **Topic 7:** <u>Dividing Decimals</u>	
Number and Operations -- Fractions *-- Addition & Subtraction with <u>Unlike</u> Denominators*	**5.NF.1 5.NF.2**	**Use equivalent fractions as a strategy to add/ subtract fractions.** ● **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. In general, **a/b + c/d = (ad + bc)/bd**. ➢ equivalent fractions ➢ simplified form ➢ improper fractions ➢ mixed numbers ● **5. NF.2** - Solving word problems involving addition/subtraction of fractions referring to the same whole, including cases of <u>unlike</u> denominators. Use benchmark fractions and number sense of fractions to estimate mentally & assess the reasonableness of answers.	**5.NF.1; 5.NF.2** Topic 9: Adding and Subtracting Fractions **Topic 10:** Adding and Subtracting Mixed Numbers	
	5.NF.3 **5.NF.4 5.NF.7** **5.NF.5** **5.NF.6**	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions**. ● **5. NF.3** - Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. ● **5. NF.4** – Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. ➢ fraction x whole number ➢ fraction x fraction ➢ applied to area ● **5. NF.5** – Interpret multiplication as scaling (resizing). ● **5. NF.6** - Solve real world problems involving multiplication of fractions and mixed numbers by using visual fraction models or equations to represent the problem. (Use all **NF** Standards.)	**5.NF.3** **5.NF.4; 5.NF.7** **5.NF.5** **5.NF.6** Topic 11: Multiplying and Dividing Fractions and Mixed Numbers	

| | | ● **5. NF.7** – Apply and extend previous understanding of division to divide *unit fractions* by whole numbers and whole numbers by *unit fractions*.
 Note: Division of a fraction by a fraction is <u>not</u> a requirement at grade 5.
 whole numbers/unit fractions   or   unit fractions/whole numbers | | |

Westside Consolidated School District   *Common Core State Standards* – Mathematics   5ᵗʰ Grade Pacing Guide

<mark>**3ʳᵈ Nine Weeks**</mark>

Domain	*Common Core State Standards*	Major Topics/Concepts	Textbook Alignment *enVision Math Common Core©2011*	Resources/ Lit Connections
Measurement and Data *- Convert like units within a given measurement system.* *- Line plots using ½, ¼, ⅛* *- Find volume using a count of unit cubes and with a formula.*	**5.MD.1**	**Convert like measurement units within a given measurement system.** ● **5. MD.1** - Convert among different sized standard measurement units within a given (the same) measurement system.	<u>**5.MD.1**</u> **Topic 13:** Units of Measure	
	5.MD.2	**Represent and interpret data**. ● **5. MD.2** – Make a line plot (using fractions) to display a data set of measurements in fractions of a unit --- ½, ¼, ⅛..	<u>**5.MD.2**</u> **Topic 14:** Data	
	5.MD.3 **5.MD.4** **5.MD.5**	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** ● **5. MD.3** – Concept of volume – Recognize volume as an attribute of solid figures and understand volume measurement: *unit cube means 1 cubic unit of volume.* ● **5. MD.4** – Measure volumes by counting *unit cubes*, using cubic cm, cubic in, cubic ft, etc.	<u>**5.MD.3**</u>; <u>**5.MD 4**</u>; <u>**5.MD.5**</u> **Topic 12:** Volume of Solids	

		● **5. MD.5** – Solve real world and mathematical problems involving volume. Relate volume to the operations of multiplication and addition; apply the formulas V=lxwxh and V= bxh; recognize volume as additive.		

Domain	CCSS	Major Topics/Concepts	Textbook	Resources
Operations and Algebraic Thinking *-- Generate 2 numerical patterns; form ordered pairs; graph on a coordinate plane.*	**5.OA.1** **5.OA.2** **5.OA.3**	**Write and interpret numerical expressions.** ● **5.OA.1** - Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. ➢ order of operations ● **5. OA.2** – Write simple expressions that record calculations with numbers; interpret numerical expressions without evaluating them. **Analyze patterns and relationships.** ● **5. OA.3** – Generate 2 numerical patterns using 2 given rules. Identify relationships between corresponding terms. Form ordered pairs using the 2 patterns; graph the ordered pairs on a coordinate plane.. ➢ graphing patterns	<u>5.OA.1; 5.OA.2; 5.OA.3</u> **Topic 8:** Numerical Expressions, Patterns, and Relationships	

Westside Consolidated School District   *Common Core State Standards* **– Mathematics   5ᵗʰ Grade Pacing Guide**

<mark>4ᵗʰ Nine Weeks</mark>

Domain	Common Core State Standards	Major Topics/Concepts	Textbook Alignment *enVision Math Common Core©2011*	Resources/ Lit Connections
Geometry *-Graph on a coordinate plane: first quadrant*	**5.G.1** **5.G.2**	**Graph points on the coordinate plane to solve real-world and mathematical problems.** ● **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 coordinates. ● **5. G.2** – Represent real world and mathematical problems by graphing points <u>in the first quadrant of the coordinate plane,</u> and interpret coordinate values of points in the context of the situation.	<u>5.G.1; 5.G.2</u> **Topic 16:** Coordinate Geometry	

5.G.3 5.G.4	**Classify two-dimensional figures into categories based on their properties.** ● **5.G.3** – Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category ● **5. G.4** – Classify two-dimensional figures in a hierarchy based on properties.	<u>5.G.3</u>; <u>5.G.4</u> **Topic 15:** Classifying Plane Figures	

Westside Consolidated School District *Common Core State Standards* – Mathematics 5th Grade At-A-Glance-Guide

Essential Questions should be incorporated into daily math activities in order to engage students in real life problem solving.

Domain	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Number and Operations in Base Ten	**5.NBT.1** **5.NBT.5** **5.NBT.2** **5.NBT.6** **5.NBT.3** **5.NBT.7** **5.NBT.4**	**5.NBT.7**		
Operations and Algebraic thinking			**5.OA.1** **5.OA.2** **5.OA.3**	
Measurement and Data			**5.MD.1** **5.MD.2** **5.MD.3** **5.MD.4** **5.MD.5**	
Geometry				**5.G.1** **5.G.2** **5.G.3** **5.G.4**
Number and Operations - Fractions		**5.NF.1** **5.NF.2** **5.NF.3** **5.NF.4** **5.NF.7** **5.NF.5** **5.NF.6**		

Document resources/ Page numbers in textbooks/ links to sites/ projects				

Westside Consolidated School District   *Common Core State Standards* – **Mathematics**   **5th Grade Pacing Guide**

Textbook Resource: Grade 5   enVision Math   *Common Core* , © 2011, Scott Foresman- Addison Wesley, Pearson Education, Inc.

Alignment of Textbook Topic Content to the _Math CCSS_:

     NOTE: Not all sections of each Topic are aligned to the _Math CCSS_ – be sure to use _ONLY_ the sections that are aligned to the _Math CCSS._

Table of Topics

Topic Number	Topic Description	*CCSS* Domain	
1	Place Value	Number and Operations in Base Ten	NBT
2	Adding and Subtracting Decimals	Number and Operations in Base Ten	NBT
3	Multiplying Whole Numbers	Number and Operations in Base Ten	NBT
4	Dividing by 1-Digit Divisors	Number and Operations in Base Ten	NBT
5	Dividing by 2-Digit Divisors	Number and Operations in Base Ten	NBT
6	Multiplying Decimals	Number and Operations in Base Ten	NBT
7	Dividing Decimals	Number and Operations in Base Ten	NBT
8	Numerical Expressions, Patterns, and Relationships	Operations and Algebraic Thinking	OA
9	Adding and Subtracting Fractions	Number and Operations -- Fractions	NF
10	Adding and Subtracting Mixed Numbers	Number and Operations -- Fractions	NF
11	Multiplying and Dividing Fractions and Mixed Numbers	Number and Operations -- Fractions	NF
12	Volume of Solids	Measurement and Data	MD
13	Units of Measure	Measurement and Data	MD
14	Data	Measurement and Data	MD
15	Classifying Plane Figures	Geometry	G
16	Coordinate Geometry	Geometry	G

Fifth Grade – *Common Core State Standards*-- MATH

Critical Areas

1. Developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (*unit fractions divided by whole numbers and whole numbers divided by unit fractions*) – Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with *unlike denominators* as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: *This is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions*.)

2. Extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations – Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

3. Developing understanding of volume – Students recognize volume as an attribute of three-dimensional space. They understand that volume can be quantified 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.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason 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.

Operations and Algebraic Thinking (Weight of Standard: 5 – 10%)   5.OA
Write and interpret numerical expressions.
5. OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these
symbols.
5. OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions
without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as*
2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having
to calculate the indicated sum or product.

Analyze patterns and relationships.
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. *For example, 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.

Number and Operations in Base Ten (Weight of Standard: 22 – 27%)   5.NBT
Understand the place value system.
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.
5. NBT.2 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. Use whole-number exponents to denote powers of 10.
5. NBT.3: Read, write, and compare decimals to thousandths.
   a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form,
   e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
   b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and
   < symbols to record the results of comparisons.
5. NBT.4 Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.
5. NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm.
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.
5. NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and
strategies based on place value, properties of operations, and/or the relationship between addition
and subtraction; relate the strategy to a written method and explain the reasoning used.

Number and Operations – Fractions (Weight of Standard: 47 – 52%)   5.NF
Use equivalent fractions as a strategy to add and subtract fractions.
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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12.*
In general, a/b + c/d = (ad + bc)/bd.
5. NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole,

including cases of unlike denominators, e.g., by 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. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

5. NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, 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. 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 which two whole numbers does your answer lie?*

5. NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
   a. 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*. *For example, 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. (In general, (a/b) × (c/d) = ac/bd.)*
   b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares 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.

5. NF.5: Interpret multiplication as scaling (resizing), by:
   a. Comparing 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.
   b. Explaining 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); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a/b = (n×a)/(n×b)* to the effect of multiplying *a/b* by 1.

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.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (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 at this grade.*)
   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) ÷ 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.*
   b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, 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.*
   c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *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 in 2 cups of raisins?

Measurement and Data (Weight of Standard: 10 – 15%)   5.MD

Convert like measurement units within a given measurement system.

5. MD.1 Convert among different-sized standard measurement units within a given measurement
system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step,
real world problems.

Represent and interpret data.

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. *For example, given different measurements of liquid in identical
beakers, find the amount of liquid each beaker would contain if the total amount in all the
beakers were redistributed equally.*

**Geometric measurement: understand concepts of volume and relate volume to multiplication
and to addition.**

5. MD.3 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.
   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.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and
improvised units.

5. MD.5 Relate volume to the operations of multiplication and addition and solve real world and
mathematical problems involving volume.
   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.
   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.
   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.

Geometry (Weight of Standard: 2 – 7%)   5.G

Graph points on the coordinate plane to solve real-world and mathematical problems.

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).

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.

Classify two-dimensional figures into categories based on their properties.

5. G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5. G.4 Classify two-dimensional figures in a hierarchy based on properties.