



Diocese of Alexandria ~ Catholic Schools

Where faith and knowledge grow



DIOCESE OF ALEXANDRIA

As the Diocese of Alexandria seeks to provide a comprehensive learning environment, we are charged to “Teach More” by showing how all learning flows from and relates to our Creator. In this way, we will give our teaching a deeper meaning and purpose than simply the content itself. With this as our goal, the Catholic Schools Office has intertwined our selected curricular standards with the Catholic Standards developed by the Cardinal Newman Society. Through the merging of these two curricula, English Language Arts, Mathematics, Science, and Social Studies, teachers will be provided a roadmap to guide student’s understanding and recognition of the relationship between learning and the connection to our God.

Thomas E. Roque, Sr.
Superintendent of Catholic Schools



DIOCESE OF ALEXANDRIA

Through comprehensive review of curricula from high performing districts throughout the United States in combination with parochial schools and Newman Cardinal Standards, the Curriculum Team for the Diocese of Alexandria has generated curricula for English Language Arts, Mathematics, Science, and Social Studies. The development of this framework is designed to guide the instructional path of teachers as they focus on the formation of their students in the areas of faith, academic excellence, responsible citizenry, and effective communication and collaboration. This process is a continuous improvement process with no defined beginning or end.

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HOW TO USE

The frameworks are guides to instruction. The frameworks assist teachers in planning and pacing instruction. Specific dates or weeks that may be included in this document are for reference. Each school and teacher must consider the make-up of their students, focusing on the needs and strengths of each child when pacing and planning instruction.

The cycles for the year help pace instruction and ensure students have consistent coverage of the content. The duration (the suggested amount of time to spend on each cycle) does not accommodate for the scheduling of special events, inclement weather or school events. Teachers, with principal guidance, should adjust pacing as needed to accommodate for these events.

RESEARCH-BASED HIGH-YIELD PRACTICES FOR INSTRUCTION

These strategies have proven effective in affecting student learning and achievement gains. As you plan daily instruction, consider how and where to integrate these strategies into the instructional sequence. Effect size is in parentheses. Please refer to the works of John Hattie for a complete description of instructional effect size.

- Classroom Discussion/Discourse (.82)
- Teacher Clarity/making the learning visible with expectations for learning (.75)
- Reciprocal Teaching (.74)
- Feedback (.73)
- Metacognitive Strategies (.69)

Student Areas

Essential Questions

- *How does mathematics help us understand God's creation?*
- *How does the use of math help us to understand the importance of clarity, reality, and goodness?*
- *How do we solve addition and subtraction sentences to solve real world problems with and without concrete objects?*
- *What are the ethical, moral, and legal implications of Internet use?*
- *How does the study of mathematics enable us to understand, communicate, and live Gospel values?*

Catholic School – Mathematics Standards (CS.GS)

CS.M.K6.GS.1	Demonstrate the mental habits of precise, determined, careful, and accurate questioning, inquiry, and reasoning.
CS.M.K6.GS.2	Develop lines of inquiry (as developmentally appropriate) to understand why things are true and why they are false.
CS.M.K6.GS.3	Recognize the power of the human mind as both a gift from God and a reflection of Him in whose image and likeness we were made.
CS.M.K6.GS.4	Survey the truths about mathematical objects that are interesting in their own right and independent of human opinions.

5th Grade - Math



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Overview

Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice for ALL UNITS
<p>Unit 1 Understanding the Place Value System</p> <ul style="list-style-type: none"> ○ 5.OA.A.1 ○ 5.OA.A.2 ■ 5.NBT.A.1 ■ 5.NBT.A.2 ■ 5.NBT.B.5 ■ 5.NBT.B.6 ■ 5.NBT.A.3 ■ 5.NBT.A.4 	<ul style="list-style-type: none"> • Write and interpret numerical expressions • Understand the place value system • Perform operations with multi-digit whole numbers and with decimals to hundredths 	<ul style="list-style-type: none"> • MP.1 Make sense of problems and persevere in solving them. • MP.2 Reason abstractly and quantitatively. • MP.3 Construct viable arguments and critique the reasoning of others. • MP.4 Model with mathematics. • MP.5 Use appropriate tools strategically. • MP.6 Attend to precision. • MP.7 Look for and make use of structure. • MP.8 Look for and express regularity in repeated reasoning.

Unit 1:

Suggested Open Educational Resources

- [5.OA.A.1 Using Operations and Parentheses](#)
- [5.OA.A.1 Watch out for Parentheses 1](#)
- [5.NBT.A.1 Which number is it?](#)
- [5.NBT.A.1 Millions and Billions of People](#)
- [5.NBT.A.3 Placing Thousandths on the Number Line](#)
- [5.NBT.A.4 Rounding to Tenths and Hundredths](#)
- [5.NBT.B.5 Elmer's Multiplication Error](#)

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Overview

Standards for Mathematical Content	Unit Focus
<p>Unit 2 Understanding Volume and Operations on Fractions</p> <ul style="list-style-type: none">■ 5.MD.C.3■ 5.MD.C.4■ 5.MD.C.5■ 5.NBT.B.5■ 5.NF.A.1■ 5.NF.A.2■ 5.NF.B.3■ 5.NF.B.4	<ul style="list-style-type: none">• Understand concepts of volume• Perform operations with multi-digit whole numbers and with decimals to hundredths• Use equivalent fractions as a strategy to add and subtract fractions• Apply and extend previous understandings of multiplication and division

Unit 2: *Suggested Open Educational Resources*

- [5.MD.C.5 Breaking Apart Composite Solids](#)
- [5.MD.C.5a using Volume to Understand the Associative Property of Multiplication](#)
- [5.MD.C.5b Cari's Aquarium](#)
- [5.MD.C Box of Clay](#)
- [5.NF.A.1 Making S'Mores](#)
- [5.NF.A.2 Do These Add Up?](#)
- [5.NF.A Measuring Cups](#)
- [5.NF.B.3 How Much Pie?](#)
- [5.NF.B.4b Chavone's Bathroom Tiles](#)

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Standards for Mathematical Content	Unit Focus
<p>Unit 3 More Operations on Fractions</p> <ul style="list-style-type: none">■ 5.NF.B.4b■ 5.NF.B.5■ 5.NF.B.6■ 5.NF.B.7■ 5.NBT.A.2■ 5.NBT.B.7□ 5.MD.A.1	<ul style="list-style-type: none">• Apply and extend previous understandings of multiplication and division• Understand the place value system• Perform operations with multi-digit whole numbers and with decimals to hundredths• Convert like measurement units within a given measurement system

Unit 3: *Suggested Open Educational Resources*

- [5.NF.B.4b New Park](#)
- [5.NF.B.5 Comparing Heights of Buildings](#)
- [5.NF.B.5 Grass Seedlings](#)
- [5.NF.B.5b Mrs. Gray's Homework Assignment](#)
- [5.NF.B.6 To Multiply or not to multiply?](#)
- [5.NF.B.7 Banana Pudding](#)
- [5.NBT.A.2 Multiplying Decimals by 10](#)
- [5.NBT.A.2 Marta's Multiplication Error](#)
- [5.NBT.B.7 The Value of Education](#)
- [5.MD.A.1, 5.NF.B.3 Converting Fractions of a Unit into a Smaller Unit](#)

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Standards for Mathematical Content	Unit Focus
<p>Unit 4 Coordinate Geometry and Classifying Figures</p> <ul style="list-style-type: none">○ 5.G.A.1○ 5.G.A.2○ 5.OA.B.3○ 5.G.B.3○ 5.G.B.4▣ 5.MD.B.2■ 5.NBT.B.5■ 5.NBT.B.7■ 5.NF.B.7	<ul style="list-style-type: none">• Graph points on the coordinate plane to solve real-world and mathematical problems• Analyze patterns and relationships• Classify two dimensional figures into categories based on their properties• Represent and interpret data• Perform operations with multi-digit whole numbers and with decimals to hundredths• Apply and extend previous understanding of multiplication and division

Unit 4:

Suggested Open Educational Resources

[5.G.A.1 Battle Ship Using Grid Paper](#)

[5.G.A.2 Meerkat Coordinate Plane Task](#)

[5.OA.B.3 Sidewalk Patterns](#)

[5.G.B.3 Always, Sometimes, Never](#)

[5.G.B.4 What is a Trapezoid? \(Part 2\)](#)

[5.MD.B.2 5.NF.A.1 Fractions on a Line Plot](#)

[5.NBT.B.7, 5.NF.B.3 What is 23 divided by 5?](#)

[5.NF.B.7c Salad Dressing](#)

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Unit 1 Grade 5

1st 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>○ 5.OA.A.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Standard convention for performing operations (Order of operations, including grouping symbols) <p>Students are able to:</p> <ul style="list-style-type: none"> evaluate numerical expressions that include grouping symbols (parentheses, brackets or braces). evaluate numerical expressions that include nested grouping symbols (for example, $3 \times [5 + (7 - 3)]$). <p>Learning Goal 1: Evaluate numerical expressions that contain parentheses, brackets and braces.</p>
<p>○ 5.OA.A.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.</i></p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Order of operations, including grouping symbols. <p>Students are able to:</p> <ul style="list-style-type: none"> write a simple numerical expression when given a verbal description. interpret the quantitative relationships in numerical expressions without evaluating (simplifying) the expression. <p>Learning Goal 2: Write numerical expressions when given a verbal description or word problem; interpret numerical expressions without evaluating them.</p>

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Unit 1 Grade 5

1st 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NBT.A.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.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none">Quantitative relationships exist between the digits in place value positions of a multi-digit number. <p>Students are able to:</p> <ul style="list-style-type: none">explain that a digit in one place represents 1/10 of what it would represent in the place to its left.explain that a digit in one place represents ten times what it would represent in the place to its right. <p>Learning Goal 3: Explain that a digit in one place represents 1/10 of what it would represent in the place to its left and ten times what it would represent in the place to its right.</p>
<p>■ 5.NBT.A.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.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none">Scientific notation and exponents <p>Students are able to:</p> <ul style="list-style-type: none">explain patterns in the number of zeros of the product when multiplying a whole number by powers of 10.write powers of 10 using whole-number exponents. <p>Learning Goal 4: Explain patterns in the number of zeros in the product when a whole number is multiplied by a power of 10; represent powers of 10 using whole-number exponents.</p>

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1st 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> multiply a whole number of up to a four digits by a whole number of up two digits using the standard algorithm with accuracy and efficiency. <p>Learning Goal 5: Use the standard algorithm to multiply a whole number of up to a four digits by a whole number of up two digits.</p>
<p>■ 5.NBT.B.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.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> divide to find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors using strategies based on place value, properties of operations, and the relationship between multiplication and division. represent these operations with equations, rectangular arrays, and area models. explain the calculation by referring to the model (equation, array, or area model). <p>Learning Goal 6: Calculate whole number quotients of whole numbers with 4-digit dividends and 2-digit divisors; explain and represent calculations with equations, rectangular arrays, and area models.</p>

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NBT.A.3. Read, write, and compare decimals to thousandths.</p> <p>5.NBT.A.3a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.</p> <p>5.NBT.A.3b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Multiple representations of whole numbers <p>Students are able to:</p> <ul style="list-style-type: none"> read and write decimals to thousandths using base-ten numerals. read and write decimals to thousandths using number names. read and write decimals to thousandths using expanded form. compare two decimals to thousandths using $>$, $=$, and $<$ symbols. compare decimals when each is presented in a different form (base-ten numeral, number name, and expanded form). <p>Learning Goal 7: Compare two decimals to thousandths using $>$, $=$, and $<$ for numbers presented as base ten numerals, number names, and/or in expanded form.</p>
<p>■ 5.NBT.A.4. Use place value understanding to round decimals to any place.</p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.6 Attend to precision.</p>	<p>Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> round decimals to any place value. <p>Learning Goal 8: Round decimals to any place value.</p>
<p>District/School Formative Assessment Plan</p>		<p>District/School Summative Assessment Plan</p>
<p><i>Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.</i></p>		<p><i>Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.</i></p>

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Unit 2 Grade 5

2nd 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.MD.C.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p> <p>5.MD.C.5a. 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.</p> <p>5.MD.C.5b. 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.</p> <p>■ 5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.</p>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> • Volume is the amount of space inside a solid (3-dimensional) figure. • Cubes with side length of 1 unit, called “a unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume. • Solid figures which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. • Volume of a solid can be determined using unit cubes of other dimensions. <p>Students are able to:</p> <ul style="list-style-type: none"> • count unit cubes in order to measure the volume of a solid. • use unit cubes of centimeters, inches, and/or other units to measure volume. <p>Learning Goal 1: Measure volume by counting the total number cubic units required to fill a figure without gaps or overlaps.</p>

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Unit 2 Grade 5

2nd 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.MD.C.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>5.MD.C.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. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.</p> <p>5.MD.C.5b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to</p>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Volume is additive: volumes of composite solids can be determined by adding the volumes of each solid. <p>Students are able to:</p> <ul style="list-style-type: none"> pack right rectangular prisms with cubes to find volume and multiply side lengths of the right rectangular prism to find volume, showing that they are the same. pack right rectangular prisms with cubes to find volume and multiply height by the area of the base, showing that they are the same. explain how both volume formulas relate to counting the cubes in one layer and multiplying that value by the number of layers (height). write the volume of an object as the product of three whole numbers. solve real-world and mathematical problems using the formulas $V = l \times w \times h$ and $V = B \times h$. find the volume of a composite solid composed of two right rectangular prisms. <p>Learning Goal 2: Show that the volume of a right rectangular prism found by counting all the unit cubes is the same as the formulas $V = l \times w \times h$ or $V = B \times h$.</p> <p>Learning Goal 3: Apply formulas to solve real world and mathematical problems involving volumes of right rectangular prisms that have whole number edge lengths.</p>

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>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.C.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.</p>		<p>Learning Goal 4: Find the volume of a composite solid figure composed of two non-overlapping right rectangular prisms, applying this strategy to solve real-world problems.</p>
<p>■ 5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none">multiply multi-digit whole numbers with accuracy and efficiency.

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
	reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Learning Goal 5: Fluently multiply multi-digit whole numbers with accuracy and efficiency.
<p>■ 5.NF.A.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. <i>For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$ (in general, $a/b + c/d = (ad + bc)/bd$).</i></p>	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): <ul style="list-style-type: none"> • Equivalent fractions can be used to add and subtract fractions. Students are able to: <ul style="list-style-type: none"> • produce an equivalent sum (or difference) of fractions with like denominators from the original sum (or difference) of fractions that has unlike denominators. • add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions. Learning Goal 6: Add and subtract fractions (including mixed numbers) with unlike denominators by replacing the given fractions with equivalent fractions having like denominators
<p>■ 5.NF.A.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases</p>	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable	Concept(s): No new concept(s) introduced Students are able to: <ul style="list-style-type: none"> • add and subtract fractions, including mixed numbers, with unlike denominators to solve word problems. • represent calculations and solutions with visual fraction models and equations

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>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.</p> <p><i>For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.</i></p>	<p>arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<ul style="list-style-type: none"> estimate answers using benchmark fractions and explain whether the answer is reasonable. estimate answers by reasoning about the size of the fractions and explain whether the answer is reasonable. <p>Learning Goal 7: Solve word problems involving adding or subtracting fractions with unlike denominators, and determine if the answer to the word problem is reasonable, using estimations with benchmark fractions.</p>
<p>■ 5.NF.B.3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). 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.</p> <p><i>For example, interpret $3/4$ as the result of</i></p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Fractions represent division. <p>Students are able to:</p> <ul style="list-style-type: none"> represent a fraction as a division statement ($a/b = a \div b$). divide whole numbers in order to solve real world problems, representing the quotient as a fraction or a mixed number. represent word problems involving division of whole numbers using visual fraction models and equations. <p>Learning Goal 8: Interpret a fraction as a division of the numerator by the denominator; solve word problems in which division of whole numbers leads to fractions or mixed numbers as solutions.</p>

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p><i>dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$. 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 what two whole numbers does your answer lie?</i></p>		
<p>■ 5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 5.NF.B.4a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.) 5.NF.B.4b. Find the area</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> • for whole number or fraction q, represent $(a/b) \times q$ as a parts of a partition of q into b equal parts [e.g. using a visual fraction model, $(3/4) \times 5$ can be represented by 3 parts, after partitioning 5 objects into 4 equal parts]. • for whole number or fraction q, represent $(a/b) \times q$ as $a \times q \div b$ [e.g. showing that $(2/5) \times 3$ is equivalent to $(2 \times 3) \div 5$]. • from a story context, interpret $(a/b) \times q$ as a parts of a partition of q into b equal parts. • tile a rectangle having fractional side lengths using unit squares of the appropriate unit fraction [e.g. given a $3 \frac{1}{4}$ inch \times $7 \frac{3}{4}$ inch rectangle, tile the rectangle using $\frac{1}{4}$ inch tiles]. • show that the area found by tiling with unit fraction tiles is the same as would be found by multiplying the side lengths. <p>Learning Goal 9: For whole number or fraction q, interpret the product $(a/b) \times q$ as a parts of a whole partitioned</p>

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>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.</p>		<p>into b equal parts added q times (e.g. using a visual fraction model).</p> <p>Learning Goal 10: Tile a rectangle with unit fraction squares to find the area and multiply side lengths to find the area of the rectangle, showing that the areas are the same.</p>
<p>District/School Formative Assessment Plan</p>		<p>District/School Summative Assessment Plan</p>
<p><i>Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.</i></p>		<p><i>Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.</i></p>

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3rd 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</p> <p>5.NF.B.4b. 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.</p>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> multiply fractional side lengths to find areas of rectangles. represent fraction products as rectangular areas. multiply a fraction by a whole number. multiply a fraction by a fraction, in general, if q is a fraction c/d, then $(a/b) \times (c/d) = a(1/b) \times c(1/d) = ac \times (1/b)(1/d) = ac(1/bd) = ac/bd$. <p>Learning Goal 1: Multiply fractions by whole numbers and fractions by fractions, drawing visual models to represent products, showing $(a/b) \times (c/d) = ab(1/bd)$, and creating story contexts.</p>
<p>■ 5.NF.B.5. Interpret multiplication as scaling (resizing), by:</p> <p>5.NF.B.5a. Comparing the size of a product to the size of one factor</p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.4 Model with mathematics.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Multiplication as resizing (scaling) <p>Students are able to:</p> <ul style="list-style-type: none"> compare the size of a product to the size of one of its factors, considering the size of the other factor (at least one factor is a fraction).

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3rd 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>on the basis of the size of the other factor, without performing the indicated multiplication.</p> <p>5.NF.B.5b. 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 $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.</p>	<p>use of structure.</p>	<ul style="list-style-type: none">• explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number.• explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.• explain that multiplying a given number by a fraction equivalent to 1 does not change the product. <p>Learning Goal 2: Explain how a product is related to the magnitude of the factors, including cases in which one factor is a fraction greater than 1 and cases in which one factor is a fraction less than 1.</p>

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NF.B.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.</p>	<p>MP.4 Model with mathematics. MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> multiply fractions and mixed numbers in order to solve real world problems. represent the solution to these real world problems with visual fraction models and equations. <p>Learning Goal 3: Solve real-world problems involving multiplication of fractions (including mixed numbers), using visual fraction models or equations to represent the problem.</p>
<p>■ 5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 5.NF.B.7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> use a story context to interpret division of a unit fraction by a whole number. divide of a unit fraction by a whole number and represent with visual fraction models. use a story context to interpret division of a whole number by a unit fraction. divide of a whole number by a unit fraction and represent with visual fraction models. divide unit fractions by whole numbers to solve real-world problems, using visual fraction models and equations to represent the problem.

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p><i>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 $(1/12) \times 4 = 1/3$.</i></p> <p>5.NF.B.7b. Interpret division of a whole number by a unit fraction, and compute such quotients. <i>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 $20 \times (1/5) = 4$.</i></p> <p>5.NF.B.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., by using visual fraction models and equations to represent the problem. <i>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?</i></p>	<p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	<ul style="list-style-type: none">• divide whole numbers by unit fractions to solve real-world problems, using visual fraction models and equations to represent the problem. <p>Learning Goal 4: Divide a unit fraction by a non-zero whole number and interpret by creating a story context or visual fraction model.</p> <p>Learning Goal 5: Divide a whole number by a unit fraction and interpret by creating a story context or visual fraction model.</p> <p>Learning Goal 6: Solve real-world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.</p>

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NBT.A.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.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> explain patterns in the placement of the decimal point when multiplying or dividing a decimal by powers of 10. write powers of 10 using whole-number exponents. <p>Learning Goal 7: Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10; represent powers of 10 using whole-number exponents.</p>
<p>■ 5.NBT.B.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.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> add and subtract decimals to hundredths using concrete models and drawings. multiply and divide decimals to hundredths using concrete models and drawings. add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. relate the strategy to the written method and explain the reasoning used. <p>Learning Goal 8: Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of</p>

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3rd 9 Weeks

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>□ 5.MD.A.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.</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.</p>	<p>operations, and/or the relationship between addition and subtraction; explain the reasoning used, relating the strategy to the written method.</p> <p>Concept(s): Measurement units can be converted within a given measurement system. Students are able to:</p> <ul style="list-style-type: none"> • convert from one measurement unit to another within a given measurement system (e.g., convert 5 cm to 0.05 m, convert minutes to hours). • solve multi-step, real world problems that require conversions. <p>Learning Goal 9: Convert standard measurement units within the same system (e.g., centimeters to meters) in order to solve multi-step problems.</p>
<p>District/School Formative Assessment Plan</p>		<p>District/School Summative Assessment Plan</p>
<p><i>Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.</i></p>		<p><i>Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.</i></p>

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Unit 4 Grade 5

4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>○ 5.G.A.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</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none">• Coordinate plane as perpendicular number lines.• Perpendicular number lines (axes) define a coordinate system.• Intersection of the lines (origin) coincides with the 0 on each number line.• Given points in the plane is located using an ordered pair of numbers (coordinates).• First numbers in an ordered pair indicates how far to travel from the origin in the direction of the x-axis.• Second numbers in an ordered pair indicate how far to travel in the direction of the y-axis. <p>Students are able to:</p> <ul style="list-style-type: none">• graph points defined by whole number coordinates in the first quadrant of the coordinate plane in order to represent real world and mathematical problems.• interpret coordinates in context. <p>Learning Goal 1: Represent real world and mathematical problems by graphing points defined by whole number coordinates in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</p>

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Unit 4 Grade 5

4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p> <p>○ 5.G.A.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.</p>		

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Unit 4 Grade 5

4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>○ 5.OA.A.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. <i>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.</i></p>	<p>MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none">• use two rules to create two numerical patterns.• compare corresponding terms (e.g. compare the first terms in each list, compare the second terms in each list, etc).• identify the relationship between corresponding terms and write ordered pairs.• graph the ordered pairs. <p>Learning Goal 2: Generate two numerical patterns from two given rules, identify the relationship between corresponding terms, create ordered pairs and graph the ordered pairs.</p>

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4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>○ 5.G.B.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <i>For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</i></p> <p>○ 5.G.B.4. Classify two-dimensional figures in a hierarchy based on properties.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none">• Attributes belonging to a category of two-dimensional figures also belong to <i>all</i> subcategories of that category. <p>Students are able to:</p> <ul style="list-style-type: none">• classify two-dimensional figures (triangles, quadrilaterals) based on shared attributes (e.g. parallel sides, number of sides, angle size, side length, etc.).• arrange the categories/subcategories of figures (e.g. squares, rectangles, trapezoids, etc) in a hierarchy based on attributes.• identify attributes of a two-dimensional shape based on attributes of the categories to which it belongs. <p>Learning Goal 3: Classify two- dimensional figures in a hierarchy based on properties.</p>

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4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.MD.B.2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.</p> <p><i>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.</i></p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> • use measurement information to create a line plot. • using measurement information presented in line plots, add, subtract, multiply and divide fractions in order to solve problems. <p>Learning Goal 4: Make a line plot to display a data set in measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$) and use it to solve problems involving the four operations on fractions with unlike denominators.</p>
<p>■ 5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> • multiply multi-digit whole numbers with accuracy and efficiency. <p>Learning Goal 5: Fluently multiply multi-digit whole numbers with accuracy and efficiency.</p>

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Unit 4 Grade 5

4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NBT.B.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.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> • add and subtract decimals to hundredths using concrete models and drawings. • multiply and divide decimals to hundredths using concrete models and drawings. • add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. • relate the strategy to the written method and explain the reasoning used. <p>Learning Goal 6: 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; explain the reasoning used, relating the strategy to the written method.</p>
<p>■ 5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 5.NF.B.7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole</p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> • use a story context to interpret division of a unit fraction by a whole number. • use a story context to interpret division of a whole number by a unit fraction. • divide unit fractions by whole numbers to solve real world problems, using visual fraction models and equations to represent the problem. • divide whole numbers by unit fractions to solve real world problems, using visual fraction models and equations to represent the problem.

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4th 9 Weeks

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <i>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?</i>	MP.8 Look for and express regularity in repeated reasoning.	Learning Goal 7: Solve real world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.
District/School Formative Assessment Plan		District/School Summative Assessment Plan
<i>Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.</i>		<i>Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.</i>

Operations and Algebraic Thinking (DOA.5.OA)

STANDARDS

ACT Reporting Category
ACT Knowledge and Skills

Write and interpret numerical expressions

DOA.5.OA.A.1	Use parentheses or brackets in numerical expressions, and evaluate expressions with these symbols.	<p>Operations and Algebraic Thinking Justification and Explanation Modeling</p> <p>Operations & Number relationships Whole Number Problem Solving</p>
DOA.5.OA.A.2	Write simple expressions that record calculations with whole numbers, fractions, and decimals, and interpret numerical expressions without evaluating them. <i>For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18,932 + 9.21)$ is three times as large as $18,932 + 9.21$, without having to calculate the indicated sum or product.</i>	<p>Operations and Algebraic Thinking Justification and Explanation Modeling</p> <p>Operations & Number relationships Whole Number Problem Solving Decimal Problem Solving</p>

Analyze patterns and relationships

DOA.5.OA.B.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. <i>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.</i>	<p>Operations and Algebraic Thinking Justification and Explanation Modeling</p> <p>Operations & Number relationships Whole Number Problem Solving</p>
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Number and Operations in Base Ten (DOA.5.NBT)

STANDARDS		ACT Reporting Category <i>ACT Knowledge and Skills</i>
Understand the place value system		
DOA.5.NBT.A.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 $\frac{1}{10}$ of what it represents in the place to its left.	Number and Operations in Base Ten Justification and Explanation Modeling Whole Number Concepts
DOA.5.NBT.A.2	Explain and apply patterns in the number of zeros of the product when multiplying a number by powers of 10. Explain and apply patterns in the values of the digits in the product or the quotient, when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. <i>For example, $10^0 = 1$, $10^1 = 10$... and $2.1 \times 10^2 = 210$.</i>	Number and Operations in Base Ten Justification and Explanation Modeling Whole Number Concepts
DOA.5.NBT.A.3	Read, write, and compare decimals to thousandths.	Number and Operations in Base Ten Justification and Explanation Modeling Decimal Concepts
DOA.5.NBT.A.3a	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (\frac{1}{10}) + 9 \times (\frac{1}{100}) + 2 \times (\frac{1}{1000})$.	
DOA.5.NBT.A.3b	Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.	
DOA.5.NBT.A.4	Use place value understanding to round decimals to any place.	Number and Operations in Base Ten Justification and Explanation Modeling Decimal Concepts
Perform operations with multi-digit whole numbers and with decimals to hundredths		
DOA.5.NBT.B.5	Fluently multiply multi-digit whole numbers using the standard algorithm.	Number and Operations in Base Ten Justification and Explanation Modeling Whole Number Operations
DOA.5.NBT.B.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, subtracting multiples of the divisor, and/or the relationship between multiplication and division. Illustrate and/or explain the calculation by using equations, rectangular arrays, area models, or other strategies based on place value.	Number and Operations in Base Ten Justification and Explanation Modeling Whole Number Operations

Number and Operations in Base Ten (DOA.5.NBT) continued...

STANDARDS		ACT Reporting Category <i>ACT Knowledge and Skills</i>
Perform operations with multi-digit whole numbers and with decimals to hundredths		
DOA.5.NBT.B.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; justify the reasoning used with a written explanation.	Number and Operations in Base Ten Justification and Explanation Modeling Decimal Operations

Number and Operations – Fractions (DOA.5.NF)

STANDARDS		ACT Reporting Category <i>ACT Knowledge and Skills</i>
Use equivalent fractions as a strategy to add and subtract fractions		
DOA.5.NF.A.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. <i>For example, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.)</i>	<p>Number and Operations Fractions Justification and Explanation Modeling</p> <p>Fraction Concepts Fraction Problem Solving</p>
DOA.5.NF.A.2	Solve word problems involving addition and subtraction of fractions.	<p>Number and Operations Fractions Justification and Explanation Modeling</p> <p>Fraction Concepts Fraction Problem Solving</p>
DOA.5.NF.A.2a	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.	
DOA.5.NF.A.2b	Use benchmark fractions and number sense of fractions to estimate mentally and justify the reasonableness of answers. <i>For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$.</i>	
Apply and extend previous understandings of multiplication and division to multiply and divide fractions		
DOA.5.NF.B.3	Interpret a fraction as division of the numerator by the denominator ($\frac{a}{b} = a \div b$). 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. <i>For example, interpret $\frac{3}{4}$ as the result of dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$. 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 what two whole numbers does your answer lie?</i>	<p>Number and Operations Fractions Justification and Explanation Modeling</p> <p>Fraction Concepts Fraction Problem Solving</p>

Number and Operations – Fractions (DOA.5.NF) continued...

STANDARDS		ACT Reporting Category <i>ACT Knowledge and Skills</i>
Apply and extend previous understandings of multiplication and division to multiply and divide fractions		
DOA.5.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	Number and Operations Fractions Justification and Explanation Modeling Fraction Concepts Fraction Problem Solving
DOA.5.NF.B.4a	Interpret the product $(m/n) \times q$ as m parts of a partition of q into n equal parts; equivalently, as the result of a sequence of operations, $m \times q \div n$. For example, use a visual fraction model to show understanding, and create a story context for $(m/n) \times q$.	
DOA.5.NF.B.4b	Construct a model to develop understanding of the concept of multiplying two fractions and create a story context for the equation. [In general, $(m/n) \times (c/d) = (mc)/(nd)$.]	
DOA.5.NF.B.4c	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.	
DOA.5.NF.B.4d	Multiply fractional side lengths to find areas of rectangles and represent fraction products as rectangular areas.	
DOA.5.NF.B.5	Interpret multiplication as scaling (resizing), by:	
DOA.5.NF.B.5a	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.	Number and Operations Fractions Justification and Explanation Modeling Fraction Concepts Fraction Problem Solving
DOA.5.NF.B.5b	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).	
DOA.5.NF.B.5c	Explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.	
DOA.5.NF.B.5d	Relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	
DOA.5.NF.B.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.	Number and Operations Fractions Justification and Explanation Modeling Fraction Concepts Fraction Problem Solving

Number and Operations – Fractions (DOA.5.NF) continued...

STANDARDS		ACT Reporting Category <i>ACT Knowledge and Skills</i>
Apply and extend previous understandings of multiplication and division to multiply and divide fractions		
DOA.5.NF.B.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. ¹	<p style="color: red; margin: 0;">Number and Operations Fractions</p> <p style="color: red; margin: 0;">Justification and Explanation</p> <p style="color: red; margin: 0;">Modeling</p> <p style="margin: 0;">Fraction Concepts</p> <p style="margin: 0;">Fraction Problem Solving</p>
DOA.5.NF.B.7a	Interpret division of a unit fraction by a non-zero whole number and compute such quotients. <i>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 $(1/12) \times 4 = 1/3$.</i>	
DOA.5.NF.B.7b	Interpret division of a whole number by a unit fraction, and compute such quotients. <i>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 $20 \times (1/5) = 4$.</i>	
DOA.5.NF.B.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., by using visual fraction models and equations to represent the problem. <i>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?</i>	

¹ 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.

Measurement and Data (DOA.5.MD)

STANDARDS		ACT Reporting Category ACT Knowledge and Skills
Convert like measurement units within a given measurement system		
DOA.5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real-world problems (e.g., convert 5 cm to 0.05 m; 9 ft to 108 in).	Measurement and Data Justification and Explanation Modeling Unit Conversions
Represent and interpret data		
DOA.5.MD.B.2	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. <i>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.</i>	Measurement and Data Geometry Justification and Explanation Modeling Descriptive Statistics
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition		
DOA.5.MD.C.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	Measurement and Data Geometry Justification and Explanation Modeling Measurement of Figures
DOA.5.MD.C.3a	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.	
DOA.5.MD.C.3b	A solid figure that can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	
DOA.5.MD.C.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	
DOA.5.MD.C.5	Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.	
DOA.5.MD.C.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. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	
DOA.5.MD.C.5b	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.	
DOA.5.MD.C.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.	

Geometry (DOA.5.G)

STANDARDS		ACT Reporting Category ACT Knowledge and Skills
Graph points on the coordinate plane to solve real-world and mathematical problems		
DOA.5.G.A.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 in the ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number in the ordered pair 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).	Geometry Justification and Explanation Modeling Coordinate Plane
DOA.5.G.A.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.	Geometry Justification and Explanation Modeling Coordinate Plane
Classify two-dimensional figures into categories based on their properties		
DOA.5.G.B.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <i>For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</i>	Geometry Justification and Explanation Modeling Figures and Their Properties
DOA.5.G.B.4	Classify quadrilaterals in a hierarchy based on properties. (Students will define a trapezoid as a quadrilateral with at least one pair of parallel sides.)	Geometry Justification and Explanation Modeling Figures and Their Properties