Louisiana Department of EDUCATION

Office of Assessments, Analytics, and Accountability

Grade 5 Mathematics

Achievement Level Descriptors

Major Content

The student solves problems involving the Major Content for the course with connections to the Standards for Mathematical Practice.

Major Content				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Addition and Subtraction with Decimals 5.NBT.B.7	Adds or subtracts two decimals to hundredths using concrete models, drawings, or strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	Adds or subtracts two decimals to hundredths using concrete models, drawings, or strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	Adds or subtracts two decimals to hundredths using concrete models, drawings, or strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	Adds or subtracts (**without regrouping**) two decimals to hundredths using concrete models, drawings, or strategies based on place value and/or the relationship between addition and subtraction.
	Relates the strategy to a written method and explains the reasoning used.	**Relates the strategy to a written method and explain the reasoning used.**		
Add and Subtract Fractions to Solve Problems 5.NF.A.2	**Creates and** solves word problems involving addition and subtraction of fractions, referring to the same whole in cases of unlike denominators by using visual fraction models and equations.	Solves word problems involving addition and subtraction of fractions, referring to the same whole in cases of unlike denominators by using visual fraction models or equations.	Solves word problems involving addition and subtraction of fractions, referring to the same whole in cases of unlike denominators by using visual fraction models or equations.	Solves word problems involving addition and subtraction of fractions **using benchmark fractions** with unlike denominators, referring to the same whole by using visual fraction models or equations.

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Major Content				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
	Assesses **and justifies** reasonableness using benchmark fractions and number sense of fractions.	**Assesses reasonableness using benchmark fractions and number sense of fractions.**		
Fractions with Unlike Denominators 5.NF.A.1	Adds and subtracts **more than three** fractions and mixed numbers with unlike denominators in such a way as to produce an equivalent sum or difference with like denominators.	Adds and subtracts **up to three** fractions and adds and subtracts two mixed numbers with unlike denominators in such a way as to produce an equivalent sum or difference with like denominators.	Adds **and** subtracts two fractions or mixed numbers with unlike denominators in such a way as to produce an equivalent sum or difference with like denominators.	Adds or subtracts two fractions or mixed numbers with unlike denominators using only fractions with denominators of 2, 4, 5 or 10 in such a way as to produce an equivalent sum or difference with like denominators.
Multiplication and Division with Decimals 5.NBT.B.7	Multiplies tenths by tenths or tenths by hundredths and divides in problems involving tenths and/or hundredths using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	Multiplies tenths by tenths **or tenths by hundredths** and divides in problems involving tenths **and/or hundredths** using concrete models or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	Multiplies tenths by tenths and divides in problems involving tenths using concrete models or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	Multiplies tenths by tenths and divides in problems involving tenths using concrete models or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction.
	Relates the strategy to a written method.	Relates the strategy to a written method.	**Relates the strategy to a written method.**	
Multiply Whole Numbers 5.NBT.B.5	Fluently multiplies a three-digit by a **two-**digit whole number using the standard algorithm.	**Fluently** multiplies a three-digit by a one-digit whole number **using the standard algorithm.**	Multiplies **a three-digit by a one-digit whole number.**	Multiplies whole numbers.

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Major Content				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Quotients and Dividends 5.NBT.B.6	Divides whole numbers 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.	Divides whole numbers 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.	Divides whole numbers up to **four-digit** dividends and one-digit divisors, where the dividend is a multiple of ten and uses strategies based on place value, the properties of operations and/or the relationship between multiplication and division.	Divides whole numbers up to three-digit dividends and one-digit divisors, **where the dividend is a multiple of ten** and uses strategies based on place value, the properties of operations and/or the relationship between multiplication and division.
	Illustrates and explains the calculations by using equations, rectangular arrays, and area models.	**Illustrates and explains the calculations by using equations, rectangular arrays, and area models.**		
	Checks reasonableness of answers with multiplication or estimation.	**Checks reasonableness of answers with multiplication or estimation.**		
	Identifies correspondences between approaches.			
Multiply and Divide Fractions to Solve Problems 5.NF.B.4 5.NF.B.6 5.NF.B.7	Solves real-world problems, by multiplying a mixed number by a fraction, a fraction by a fraction and a whole number by a fraction; dividing a fraction by a whole number and a whole number by a fraction using visual fraction models and creating context for the mathematics, including rectangular areas; and interpreting the product and/or quotient.	**Solves real-world problems,** by multiplying a **mixed number by a fraction,** a fraction by a fraction and a whole number by a fraction; dividing a fraction by a whole number and a whole number by a fraction using visual fraction models and creating context for the mathematics, including rectangular areas; **and interpreting the product and/or quotient.**	Multiplies a fraction or a whole number by a fraction and divides a fraction by a whole number or whole number by a fraction using visual fraction models **and creating context for the mathematics, including rectangular areas.**	Multiplies a fraction or a whole number by a fraction and divides a fraction by a whole number or whole number by a fraction using visual fraction models.

Major Content				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Interpret Fractions 5.NF.B.3	Solves word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.	Solves word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.	Solves word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.	Solves word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers by using manipulatives or visual models **to identify between which two whole numbers the answer lies.**
	Interprets the fraction as division of the numerator by the denominator.	Interprets the fraction as division of the numerator by the denominator.	**Interprets the fraction as division of the numerator by the denominator.**	
	Creates a model representing the situation.	**Identifies a simple model representing the situation.**		
Recognize and Represent Volume 5.MD.C.3 5.MD.C.4	Recognizes volume as an attribute of solid figures and understands volume is measured using cubic units and can be found by packing a solid figure with unit cubes and counting them.	Recognizes volume as an attribute of solid figures and understands volume is measured using cubic units and can be found by packing a solid figure with unit cubes and counting them.	Recognizes volume as an attribute of solid figures and understands volume is measured using cubic units and can be found by packing a solid figure with unit cubes and counting them.	Recognizes volume as an attribute of solid figures and, **with a visual model**, understands volume is measured using cubic units and can be found by packing a solid figure with unit cubes and counting them.
	Represents the volume of a solid figure as "*n*" cubic units.	**Represents the volume of a solid figure as "*n*" cubic units.**		
Determine Volume 5.MD.C.5b 5.MD.C.5c	Solves real-world and mathematical problems by applying the formulas for volume, relating volume to the operations of multiplication and addition, and recognizing volume is additive by finding the volume of solid figures of two non-overlapping parts.	Solves real-world and mathematical problems by applying the formulas for volume, relating volume to the operations of multiplication and addition, and recognizing volume is additive by finding the volume of solid figures of two non-overlapping parts.	Given a visual model, solves real-world and mathematical problems **by applying the formulas** for volume, relating volume to the operations of multiplication and addition, **and recognizing volume is additive by finding the volume of solid figures of two non-overlapping parts.**	**Given a visual model and the formulas** for finding volume, solves real-world and mathematical problems by applying the formulas for volume ($V = l \times w \times h$ and $V = B \times h$).

Major Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Read, Write, and Compare Decimals 5.NBT.A.3 5.NBT.A.4	Reads, writes, and compares decimals to **any place** using numerals and symbols and rounds to any place and chooses appropriate context given a rounded number.	Reads, writes, and compares decimals to the **thousandths** using numerals, number names, expanded form and symbols (>, <, =) and rounds to any place.	Reads, writes, and compares decimals to the **hundredths** using numerals, number names, expanded form and symbols (>, <, =), and rounds to any place with scaffolding.	Reads, writes, and compares decimals to the **tenths** using numerals, number names, expanded form and symbols (>, <, =), and **rounds to any place with scaffolding**.
Place Value 5.NBT.A.1 5.NBT.A.2 LEAP.I.5.1	In any multi-digit number, recognizes 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, uses whole number exponents to denote powers of 10 **and uses symbols to compare two powers of 10 expressed exponentially (compare 10^2 to 10^5).**	In any multi-digit number, recognizes 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 and uses whole number exponents to denote powers of 10.	In any multi-digit number, recognizes a digit in one place represents 10 times as much as it represents in the place to its right or 1/10 of what it represents in the place to its left **and uses whole number exponents to denote powers of 10.**	In any multi-digit number, recognizes a digit in one place represents 10 times as much as it represents in the place to its right or 1/10 of what it represents in the place to its left **by using manipulatives or visual models.**
Multiplication Scaling 5.NF.B.5a	Interprets multiplication scaling by comparing the size of the product to the size of one factor on the basis of the size of the second factor without performing the indicated multiplication with **two fractions.**	Interprets multiplication scaling by comparing the size of the product to the size of one factor on the basis of the size of the second factor **without performing the indicated multiplication, focusing on one factor being a fraction greater than or less than one.**	Interprets multiplication scaling by comparing the size of a product to the size of one factor on the basis of the size of the second factor by performing the indicated multiplication where one factor is a fraction less than one.	Interprets multiplication scaling by comparing the size of a product to the size of one factor on the basis of the size of the second factor **by performing the indicated multiplication** where one factor is a fraction less than one **using manipulatives or visual models.**

Additional & Supporting Content

The student solves problems involving the Additional & Supporting Content for the course with connections to the Standards for Mathematical Practice.

Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Write and Interpret Numerical Expressions 5.OA.A.1 5.OA.A.2	Uses parentheses or brackets to write and evaluate numerical expressions.	Uses parentheses or brackets to write **and/or** evaluate numerical expressions.	Uses parentheses or brackets to write **or** evaluate numerical expressions.	Uses parentheses or brackets to write simple numerical expressions.
	Interprets numerical expressions without evaluating them.	Interprets numerical expressions without evaluating them.	**Interprets simple numerical expressions without evaluating them.**	
Coordinate Plane 5.G.A.1 5.G.A.2 5.OA.B.3	Represents real-world and mathematical problems by locating and graphing points in the first quadrant of a coordinate plane and interprets coordinate values of points in the context of the situation.	Represents real-world and mathematical problems by locating and graphing points in the first quadrant of a coordinate plane **and interprets coordinate values of points in the context of the situation.**	Represents real-world and mathematical problems by locating **and** graphing points in the first quadrant of a coordinate plane.	Represents real-world and mathematical problems by locating or graphing points in the first quadrant of a coordinate plane.
Two-Dimensional Figures 5.G.B.3 5.G.B.4	Classifies two-dimensional figures in a hierarchy based on properties.	Classifies two-dimensional figures in a hierarchy based on properties.	Classifies two-dimensional figures **in a hierarchy** based on properties.	Classifies two-dimensional figures based on properties.
	Demonstrates that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.	**Understands that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.**	**Understands that shared attributes categorize two-dimensional figures.**	
	Uses appropriate tools to determine similarities and differences between categories and subcategories.			

Additional & Supporting Content				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Units and Conversion 5.MD.A.1	Converts among different-sized standard measurement units within a given measurement system and uses these conversions to solve real-world, multi-step problems.	Converts among different-sized standard measurement units within a given measurement system and uses these conversions to solve real-world, **multi-step** problems.	Converts among different-sized standard measurement units within a given measurement system **and uses these conversions to solve real-world**, one-step problems.	Converts among different-sized standard measurement units within a given measurement system and **solves one-step problems by using manipulatives or visual models.**
	Chooses the appropriate measurement unit based on the given context.			
Data Displays 5.MD.B.2	Makes a line plot to display a data set of measurements in fractions of a unit with denominators limited to 2, 4, and 8, uses operations on fractions to solve problems involving information in line plots, and **interprets the solution in relation to the data.**	Makes a line plot to display a data set of measurements in fractions of a unit with denominators limited to 2, 4, and **8**, and uses operations on fractions to solve problems involving information in line plots.	Makes a line plot to display a data set of measurements in fractions of a unit with denominators limited to 2 and 4, and uses operations on fractions with denominators of 2 and 4 to solve problems involving information in line plots.	Makes a line plot to display a data set of measurements in fractions of a unit with denominators limited to 2 and 4, and uses operations on fractions with denominators of 2 and 4 to solve problems involving information in line plots.

Mathematical Reasoning & Modeling

In connection with course content, the student: expresses course-level appropriate mathematical reasoning by constructing viable arguments and critiquing the reasoning of others; attends to precision when making mathematical statements; solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses); engages in the modeling practice by using mathematics to solve problems arising in everyday scenarios; makes sense of problems and perseveres when solving them; uses appropriate tools strategically; and looks for and makes use of structure.

Type II				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
	In connection with the content knowledge and skills described in Major Content, the student **clearly** constructs and communicates a		In connection with the content knowledge and skills described in Major Content, the student constructs and communicates a	
LEAP.II.5.1 LEAP.II.5.2 LEAP.II.5.3 LEAP.II.5.4	**complete** written response based on properties of operations; the relationships between addition and subtraction and between multiplication and division; and identification of arithmetic patterns		written response based on properties of operations; the relationships between addition and subtraction and between multiplication and division; and identification of arithmetic patterns	
LEAP.II.5.5 LEAP.II.5.6 LEAP.II.5.7 LEAP.II.5.8 LEAP.II.5.9	**well-organized and complete** response based on operations using concrete referents such as diagrams, including number lines, (whether provided in the prompt **or constructed by the student**) and connecting the diagrams to a written (symbolic) method		response based on operations using concrete referents such as diagrams, including number lines, (provided in the prompt) and connecting the diagrams to a written (symbolic) method	
	well-organized and complete response by presenting and defending solutions to multi-step problems as valid chains of reasoning; using symbols appropriately; **evaluating** reasoning; and presenting **and defending** corrected reasoning	**well-organized** and complete response by presenting **and defending** solutions to multi-step problems as valid chains of reasoning; using symbols appropriately; distinguishing correct and flawed reasoning; and identifying and describing a flaw in reasoning or in solutions to multi-step problems; and presenting corrected reasoning	complete response by presenting solutions to **multi-step** problems as valid chains of reasoning; using symbols appropriately; distinguishing correct and flawed reasoning; and identifying and **describing a flaw in reasoning or solutions to multi-step problems; and presenting corrected reasoning**	response by presenting solutions to scaffolded two-step problems as valid chains of reasoning; using symbols appropriately; distinguishing correct and flawed reasoning; and identifying a flaw in reasoning

Type II				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
	Responses may include:			
	a logical/defensible approach based on a conjecture and/or stated assumptions, using mathematical connections	a logical/**defensible approach based on a conjecture and/or stated assumptions, using mathematical connections**	a **logical** approach based on a conjecture and/or stated assumptions	an approach based on a conjecture and/or stated or faulty assumptions
	an **efficient** and logical progression of steps **with appropriate justification**	a logical progression of steps	a **logical**, but incomplete, progression of steps	an incomplete or illogical progression of steps
	precision of calculation	precision of calculation	minor calculation errors	an intrusive calculation error
	fluent use of grade-level vocabulary, symbols, and labels	**fluent** use of grade-level vocabulary, symbols, and labels	limited use of grade-level vocabulary, symbols, and labels	limited use of grade-level vocabulary, symbols, and labels
	justification of a conclusion	justification of a conclusion	partial justification of a conclusion based on calculations	partial justification of a conclusion based on calculations
	determining whether an argument or conclusion is generalizable			
	evaluating, interpreting and critiquing the validity of responses, reasoning, and approaches, using mathematical connections and **providing a counter-example where applicable**	evaluating, **interpreting, and critiquing** the validity of responses, **reasoning,** and approaches **using mathematical connections**	**evaluating the validity of responses, approaches, and conclusions**	

Type III				
	Level 5: Advanced	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Content	In connection with the content knowledge, skills, and abilities described in Major Content, the student devises a plan and applies mathematics to solve multi-step, real-world contextual word problems by:			
LEAP.III.5.1 LEAP.III.5.2	using stated assumptions and approximations or making assumptions to simplify a real-world situation	using stated assumptions and approximations or **making assumptions** to simplify a real-world situation	using stated assumptions and approximations to simplify a real-world situation	using stated assumptions and approximations to simplify a real-world situation
	analyzing and/or creating constraints, relationships, and goals			
	mapping relationships between quantities by selecting appropriate tools to create models	**mapping relationships** between quantities by **selecting appropriate** tools to create models	**illustrating relationships between quantities** by using provided tools to create models	identifying quantities by using provided tools to create models
	analyzing relationships mathematically between quantities to draw conclusions	analyzing relationships mathematically between quantities to draw conclusions	analyzing relationships mathematically **between quantities** to draw conclusions	analyzing relationships mathematically to draw conclusions
	justifying and defending models to lead to a conclusion			
	interpreting mathematical results in the context of the situation	interpreting mathematical results **in the context of the situation**	**interpreting mathematical results in a simplified context**	
	reflecting on whether results make sense	reflecting on whether results make sense	**reflecting on whether results make sense**	
	improving a model if it has not served its purpose	modifying **and/or improving** a model if it has not served its purpose	**modifying a model if it has not served its purpose**	
	writing a **concise** arithmetic expression or equation to describe a situation	writing an arithmetic expression or equation to describe a situation	writing an arithmetic expression or equation to describe a situation	writing an arithmetic expression or equation to describe a situation