

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





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





		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 <b>two</b> -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 <b>four-digit</b> 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.  Checks reasonableness of answers with multiplication or estimation.  Identifies correspondences between approaches.	Illustrates and explains the calculations by using equations, rectangular arrays, and area models.  Checks reasonableness of answers with multiplication or estimation.		





		Major Content		
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Multiply and	Solves real-world problems, by	Solves real-world problems,	Multiplies a fraction or a	Multiplies a fraction or a
Divide	multiplying a mixed number by	by multiplying a <b>mixed</b>	whole number by a fraction	whole number by a fraction
Fractions to	a fraction, a fraction by a	number by a fraction, a	and divides a fraction by a	and divides a fraction by a
Solve	fraction and a whole number	fraction by a fraction and a	whole number or whole	whole number or whole
Problems	by a fraction; dividing a	whole number by a fraction;	number by a fraction using	number by a fraction using
5.NF.B.4	fraction by a whole number	dividing a fraction by a whole	visual fraction models <b>and</b>	visual fraction models.
5.NF.B.6	and a whole number by a	number and a whole number	creating context for the	
5.NF.B.7	fraction using visual fraction	by a fraction using visual	mathematics, including	
	models and creating context	fraction models and creating	rectangular areas.	
	for the mathematics, including	context for the mathematics,		
	rectangular areas; and	including rectangular areas;		
	interpreting the product	and interpreting the product		
	and/or quotient.	and/or quotient.		
Interpret	Solves word problems	Solves word problems	Solves word problems	Solves word problems
Fractions	involving division of whole	involving division of whole	involving division of whole	involving division of whole
5.NF.B.3	numbers leading to answers in	numbers leading to answers	numbers leading to	numbers leading to answers
	the form of fractions or mixed	in the form of fractions or	answers in the form of	in the form of fractions or
	numbers.	mixed numbers.	fractions or mixed	mixed numbers by using
			numbers.	manipulatives or visual
				models to identify between
				which two whole numbers
				the answer lies.
	Interprets the fraction as	Interprets the fraction as	Interprets the fraction as	
	division of the numerator by	division of the numerator by	division of the numerator	
	the denominator.	the denominator.	by the denominator.	
	Creates a model representing	Identifies a simple model		
	the situation.	representing the situation.		





		Major Content		
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
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 $(V = I \times w \times h \text{ and } V = B \times h)$ .
Read, Write, and Compare Decimals 5.NBT.A.3 5.NBT.A.4	Reads, writes, and compares decimals to <b>any place</b> using numerals and symbols and rounds to any place and chooses appropriate context given a rounded number.	Reads, writes, and compares decimals to the <b>thousandths</b> 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 <b>tenths</b> using numerals, number names, expanded form and symbols (>, <, =), and <b>rounds to any place with scaffolding</b> .





	Major Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
Place Value	In any multi-digit number,	In any multi-digit number,	In any multi-digit number,	In any multi-digit number,	
5.NBT.A.1	recognizes a digit in one place	recognizes a digit in one	recognizes a digit in one	recognizes a digit in one	
5.NBT.A.2	represents 10 times as much	place represents 10 times as	place represents 10 times	place represents 10 times as	
LEAP.I.5.1	as it represents in the place to	much as it represents in the	as much as it represents in	much as it represents in the	
	its right and 1/10 of what it	place to its right and 1/10 of	the place to its right or	place to its right or 1/10 of	
	represents in the place to its	what it represents in the	1/10 of what it represents	what it represents in the	
	left, uses whole number	place to its left and uses	in the place to its left <b>and</b>	place to its left <b>by using</b>	
	exponents to denote powers	whole number exponents to	uses whole number	manipulatives or visual	
	of 10 and uses symbols to	denote powers of 10.	exponents to denote	models.	
	compare two powers of 10		powers of 10.		
	expressed exponentially				
	(compare 10 <sup>2</sup> to 10 <sup>5</sup> ).				
Multiplication	Interprets multiplication	Interprets multiplication	Interprets multiplication	Interprets multiplication	
Scaling	scaling by comparing the size	scaling by comparing the size	scaling by comparing the	scaling by comparing the size	
5.NF.B.5a	of the product to the size of	of the product to the size of	size of a product to the size	of a product to the size of	
	one factor on the basis of the	one factor on the basis of the	of one factor on the basis	one factor on the basis of	
	size of the second factor	size of the second factor	of the size of the second	the size of the second factor	
	without performing the	without performing the	factor by performing the	by performing the indicated	
	indicated multiplication with	indicated multiplication,	indicated multiplication	multiplication where one	
	two fractions.	focusing on one factor being	where one factor is a	factor is a fraction less than	
		a fraction greater than or	fraction less than one.	one <b>using manipulatives or</b>	
		less than one.		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.

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





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





## **EXPRESSING MATHEMATICAL REASONING**

In connection with course content, the student expresses course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

	Expressing Mathematical Reasoning				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
		knowledge and skills described in rly constructs and communicates a	In connection with the content kn described in Major Content, the st 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		relationships between addition and subtraction and between multiplication and division; and identification of arithmetic patterns  response based on operations using concrete referents such as diagrams, including number lines, (provided in the		
LEAP.II.5.5 LEAP.II.5.6 LEAP.II.5.7 LEAP.II.5.8	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				
LEAP.II.5.9	well-organized and complete response by presenting and defending solutions to multistep 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 reasoning from flawed; 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 reasoning from flawed; 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 reasoning from flawed; and identifying a flaw in reasoning	





	Expressing Mathematical Reasoning				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
	Responses may include:				
	a logical/defensible approach	a logical/defensible approach	a logical approach based on a	an approach based on	
	based on a conjecture and/or	based on a conjecture and/or	conjecture and/or stated	a conjecture and/or	
	stated assumptions, using	stated assumptions, using	assumptions	stated or faulty	
	mathematical connections	mathematical connections		assumptions	
	an <b>efficient</b> and logical	a logical progression of steps	a <b>logical</b> , but incomplete,	an incomplete or	
	progression of steps with		progression of steps	illogical progression of	
	appropriate justification	nuncial and administration	unio an adaulatia a aurana	steps	
	precision of calculation	precision of calculation	minor calculation errors	an intrusive calculation error	
	fluent use of grade-level	fluent use of grade-level	limited use of grade-level	limited use of grade-	
	vocabulary, symbols, and	vocabulary, symbols, and labels	vocabulary, symbols, and labels	level vocabulary,	
	labels	vocabalary, symbols, and labels	vocasaiai y, symsois, ana iaseis	symbols, and labels	
	justification of a conclusion	justification of a conclusion	partial justification of a	partial justification of a	
			conclusion based on calculations	conclusion based on	
				calculations	
	determining whether an				
	argument or conclusion is				
	generalizable				
	evaluating, interpreting and	evaluating, interpreting, and	evaluating the validity of		
	critiquing the validity of	critiquing the validity of	responses, approaches, and		
	responses, reasoning, and	responses, reasoning, and	conclusions		
	approaches, using	approache,s using mathematical			
	mathematical connections	connections			
	and providing a counter- example where applicable				
	chample where applicable				





#### **MODELING & APPLICATION**

In connection with content, the student 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), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning.

	Modeling & Application			
	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Content	In connection with the content k	nowledge, skills, and abilities descr	ibed in Major Content, the stud	dent devises a plan and
	applies mathematics to solve mu	lti-step, real-world contextual wor	d problems by:	
LEAP.III.5.1	using stated assumptions and	using stated assumptions and	using stated assumptions	using stated assumptions
LEAP.III.5.2	approximations or making	approximations or making	and approximations to	and approximations to
	assumptions to simplify a real-	assumptions to simplify a real-	simplify a real-world	simplify a real-world
	world situation	world situation	situation	situation
	analyzing and/or creating			
	constraints, relationships, and			
	goals			
	mapping relationships between	mapping relationships	illustrating relationships	identifying quantities by
	quantities by selecting	between quantities by	<b>between quantities</b> by using	using provided tools to
	appropriate tools to create	selecting appropriate tools to	provided tools to create	create models
	models	create models	models	
	analyzing relationships	analyzing relationships	analyzing relationships	analyzing relationships
	mathematically between	mathematically between	mathematically <b>between</b>	mathematically to draw
	quantities to draw conclusions	quantities to draw conclusions	quantities to draw	conclusions
			conclusions	
	justifying and defending			
	models to lead to a conclusion			
	interpreting mathematical	interpreting mathematical	interpreting mathematical	
	results in the context of the	results in the context of the	results in a simplified	
	situation	situation	context	





Modeling & Application				
	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Content	In connection with the content k	nowledge, skills, and abilities descr	ribed in Major Content, the stud	dent devises a plan and
	applies mathematics to solve mu	lti-step, real-world contextual wor	d problems by:	
	reflecting on whether results	reflecting on whether results	reflecting on whether	
	make sense	make sense	results make sense	
	improving a model if it has not	modifying and/or improving a	modifying a model if it has	
	served its purpose	model if it has not served its	not served its purpose	
		purpose		
	writing a <b>concise</b> arithmetic	writing an arithmetic	writing an arithmetic	writing an arithmetic
	expression or equation to	expression or equation to	expression or equation to	expression or equation to
	describe a situation	describe a situation	describe a situation	describe a situation