

# **Grade 7 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	
Analyze	Analyzes and uses	Analyzes and uses proportional	Uses proportional	Identifies proportional	
Proportional	proportional relationships to	relationships to solve real-	relationships to solve <b>real</b> -	relationships to solve	
Relationships	solve real-world and	world and mathematical	world and mathematical	mathematical problems,	
and Solve	mathematical problems,	problems, including simple	problems, including simple	including ratio/percent	
Problems	including <b>multi-step</b>	ratio/percent problems.	ratio/percent problems.	problems.	
7.RP.A.1	ratio/percent problems.				
7.RP.A.2	Computes unit rates of	Computes unit rates of	Computes unit rates of		
7.RP.A.3	quantities associated with	quantities associated with	quantities associated with		
	ratios of fractions.	ratios of fractions.	ratios of fractions.		
	Decides whether two	Decides whether two	<b>Decides</b> whether two	Identifies whether two	
	quantities are in a	quantities are in a proportional	quantities are in a	quantities are in a	
	proportional relationship and	relationship and identifies the	proportional relationship	proportional relationship.	
	identifies the constant of	constant of proportionality in	and identifies the constant		
	proportionality in tables,	tables, equations, diagrams,	of proportionality in tables,		
	equations, diagrams, verbal	verbal descriptions, and	equations, diagrams, verbal		
	descriptions, and graphs.	graphs.	descriptions, and graphs.		
	Interprets a point (x, y) on the	Interprets a point (x, y) on the			
	graph of a proportional	graph of a proportional			
	relationship in terms of the	relationship in terms of the			
	situation, with special	situation, with special			
	attention to the points (0, 0)	attention to the points (0, 0)			
	and $(1, r)$ where $r$ is the unit	and (1, r) where r is the unit			
	rate.	rate.			





	Major Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
	Represents proportional relationships with equations and uses the equations to solve mathematical and realworld problems, including multi-step ratio and percent problems.	Represents proportional relationships with equations and uses the equations to solve mathematical and real-world problems, including simple ratio and percent problems.	Uses equations representing proportional relationships to solve mathematical and realworld problems, including ratio and percent problems.		
	Determines when it is				
	appropriate to use a unit rate				
	and understands its				
	limitations.				
Operations	Performs operations on	Performs operations on	Performs operations on	Performs operations on	
with Rational	positive and negative rational	positive and negative rational	positive and negative	positive and negative	
Numbers	numbers in multi-step	numbers in <b>multi-step</b>	rational numbers in	rational numbers in	
7.NS.A.1	mathematical and real-world	mathematical and real-world	mathematical and real-	mathematical problems.	
7.NS.A.2	problems.	problems.	world problems.		
7.NS.A.3	Represents addition and	Represents addition and	Represents addition and	Represents addition and	
7.EE.B.3	subtraction on a horizontal or	subtraction on a horizontal or	subtraction on a horizontal	subtraction on a horizontal	
	vertical number line and	vertical number line and	or vertical number line <b>and</b>	or vertical number line.	
	recognizes situations in which	recognizes situations in which	recognizes situations in		
	opposite quantities combine	opposite quantities combine to	which opposite quantities		
	to make zero.	make zero.	combine to make zero.		
	Determines reasonableness of	Determines reasonableness of			
	a solution and interprets	a solution.			
	solutions in real-world				
	contexts.				





	Major Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
	Understands subtraction of	Identifies equivalent			
	rational numbers as adding	expressions of positive and			
	the additive inverse and the	negative rational numbers.			
	rules for multiplying/dividing				
	positive and negative				
	numbers.				
Expressions,	Applies properties of	Applies properties of	Applies properties of	Applies properties of	
Inequalities,	operations as strategies to	operations as strategies to add,	operations as strategies to	operations as strategies to	
and Equations	add, subtract, factor, and	subtract, <b>factor,</b> and expand	add, subtract, and expand	add and subtract linear	
7.EE.A.1	expand linear expressions.	linear expressions.	linear expressions.	expressions.	
7.EE.A.2	Fluently solves two-step linear	Fluently solves two-step linear	Solves <b>two-step</b> linear	Solves one-step linear	
7.EE.B.4	equations with rational	equations with rational	equations with rational	equations with rational	
	coefficients.	coefficients.	coefficients.	coefficients.	
	In mathematical or real-world	In a mathematical <b>or real</b> -	In a mathematical context,		
	contexts, uses variables to	world context, uses variables	uses variables to represent		
	represent quantities,	to represent quantities,	quantities, construct and		
	construct and solve equations	construct and solve equations	solve equations and		
	and inequalities, and graph	and inequalities, and graph	inequalities, and graph		
	and interpret solution sets.	solution sets.	solution sets.		
	Rewrites an expression in	Identifies equivalent			
	different forms.	expressions in different forms.			
	<b>Describes</b> the relationship	Identifies the relationship			
	between equivalent quantities	between equivalent quantities			
	that are expressed	that are expressed			
	algebraically in different forms	algebraically in different forms			
	in a problem context <b>and</b>	in a problem context.			
	explains their equivalence in				
	light of the context of the				
	problem.				





## **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	
Representing	Identifies triangles with given	Identifies triangles with given	Identifies triangles with		
Geometric	angle and side conditions and	angle and side conditions <b>and</b>	given angle and side		
Figures	notices when those conditions	notices when those	conditions.		
7.G.A.2	determine a unique triangle,	conditions determine a			
7.G.A.3	more than one triangle, or no	unique triangle, more than			
	triangle.	one triangle, or no triangle.			
	Identifies a two-dimensional	Identifies a two-dimensional			
	figure as the result of slicing a	figure as the result of slicing a			
	three-dimensional figure by a	three-dimensional figure by a			
	plane.	plane perpendicular or			
		parallel to a base or face.			
Solve Scale,	Solves mathematical and real-	Solves mathematical and real-	Solves mathematical	Solves mathematical	
Angle, Area,	world problems involving	world problems involving	problems involving	problems involving	
Circumference,	circumference, area, surface	circumference, area, surface	circumference, area,	circumference and area.	
Surface Area,	area, and volume, including	area, and volume.	surface area, and volume.		
and Volume	composite objects.				
Problems	Solves problems involving scale	Solves problems involving	Solves problems involving	Solves problems involving	
7.G.A.1	drawings of geometric figures,	scale drawings of geometric	scale drawings of	scale drawings of	
7.G.B.4	including reproducing a scale	figures, including reproducing	geometric figures.	geometric figures.	
7.G.B.5	drawing at a different scale.	a scale drawing at a different			
7.G.B.6		scale.			
	Represents angle relationships	Represents angle	Uses facts about angle		
	using equations to solve for	relationships using equations	relationships to		
	unknown angles.	to solve for unknown angles.	determine the measure of		
			unknown angles.		





	Additional & Supporting Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic	
	Produces a logical conclusion	Identifies an informal			
	<b>about</b> the relationship between	derivation of the relationship			
	the circumference and area of	between the circumference			
	a circle.	and area of a circle.			
Random	Understands and uses random	Understands and uses	Draws inferences about a		
Sampling and	sampling to draw inferences	random sampling to draw	population from a table		
Comparative	about a population.	inferences about a population.	or graph of random		
Inferences			samples.		
7.SP.A.1	Draws relevant informal	Draws <b>relevant</b> informal	Draws informal	Compares two populations	
7.SP.A.2	comparative inferences about	comparative inferences about	comparative inferences	based on measures of	
7.SP.B.3	two populations, including	two populations, including	about two populations.	center and variability.	
7.SP.B.4	assessing the degree of visual	identifying characteristics of			
	overlap of two numerical data	visual overlap of two			
	distributions with similar	numerical data distributions			
	variabilities.	with similar variabilities.			
	Determines whether a sample	Determines whether a			
	is representative of a	sample is representative of a			
	population.	population.			
Chance	Understands that the	Understands that the	Understands that the	Understands that the	
Processes and	probability of a chance event is	probability of a chance event	probability of a chance	probability of a chance	
Probability	a number between 0 and 1 that	is a number between 0 and 1	event is a number	event is a number between	
Models	expresses the likelihood of the	that expresses the likelihood	between 0 and 1 that	0 and 1 that expresses the	
7.SP.C.5	event occurring.	of the event occurring.	expresses the likelihood of	likelihood of the event	
7.SP.C.6			the event occurring.	occurring.	
7.SP.C.7	Generates a sample space to	Determines probabilities	Determines probabilities		
7.SP.C.8	determine the probability of	when given sample spaces for	when given sample		
	simple or compound events	simple and compound events	spaces for simple events		
	using methods such as	using methods such as	using methods such as		
	organized lists, tables, tree	organized lists, tables, and	organized lists and tables.		
	diagrams, or simulations.	tree diagrams.			





	Additional & Supporting Content					
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic		
	Develops probability models to determine the probabilities of events.	Develops a model to approximate the probability of a chance event and predicts approximate frequencies when given the probability or by observing frequencies in data generated from the process.				
	Designs and uses a simulation to generate frequencies for and estimate the probability of compound events.					





### **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	
	In connection with the content knowledge and skills described in Major Content, the student <b>clearly</b> constructs and communicates a <b>complete</b>		In connection with the content knowledge and skills described in Major Content, the student constructs and communicates a		
LEAP.II.7.1	written response based on pro	perties of operations; and the rela	ationships between addition and sub	traction and between	
LEAP.II.7.2	multiplication and division				
LEAP.II.7.3	response based on concrete re-	ferents provided in the prompt o	r constructed by the student such as	: diagrams that are	
LEAP.II.7.4	connected to a written (symbo	lic) method, number line diagram	s, or coordinate plane diagrams		
LEAP.II.7.5	response to a given equation, r	nulti-step problem, proposition o	r conjecture		
LEAP.II.7.6	Responses may include:				
LEAP.II.7.7	a logical approach based on a	a logical approach based on a	a logical approach based on a	a faulty approach based on	
	conjecture and/or stated	conjecture and/or stated	conjecture and/or stated	a conjecture and/or stated	
	assumptions	assumptions	assumptions	assumptions	
	a logical and complete	a logical <b>and complete</b>	a logical, but incomplete,	an incomplete or illogical	
	progression of steps	progression of steps	progression of steps	progression of steps	
	precise of calculation	precise calculation	minor calculation errors	major calculation errors	
	fluent use of grade-level	fluent use of grade-level	limited use of grade-level	limited use of grade-level	
	vocabulary, symbols, and	vocabulary, symbols, and	vocabulary, symbols, and labels	vocabulary, symbols, and	
	labels	labels		labels	
	complete justification of a	complete justification of a	partial justification of a	partial justification of a	
	conclusion	conclusion	conclusion	conclusion	
	generalization of an				
	argument or conclusion				





	Expressing Mathematical Reasoning					
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic		
	evaluating, interpreting and critiquing the validity and efficiency of responses, reasoning, approaches, and conclusions, using mathematical connections and providing counterexamples where applicable	evaluating, interpreting, and critiquing the validity of responses, reasoning, approaches, and conclusions	evaluating the validity of approaches and conclusions			
	identifying and describing	identifying and describing	identifying and describing errors			
	errors in solutions and	errors in solutions and	in solutions			
	presenting correct solutions	presenting correct solutions				
	distinguishing correct	identifying and describing				
	reasoning from flawed and	flaws in reasoning and				
	correcting flawed reasoning	presenting correct reasoning				





#### **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	ribed in Major Content, the stud	lent devises a plan to apply	
	mathematics in solving problems arising in everyday life, society and the workplace by:				
LEAP.III.7.1	using stated assumptions and	using stated assumptions and	using stated assumptions	using stated assumptions	
LEAP.III.7.2	making assumptions and	making assumptions and	and approximations to	and approximations to	
LEAP.III.7.3	approximations to simplify a	approximations to simplify a	simplify a real-world	simplify a real-world	
LEAP.III.7.4	real-world situation	real-world situation	situation	situation	
	analyzing and/or creating	creating limitations and goals			
	limitations, relationships, and	within a model			
	interpreting goals within a				
	model				
	analyzing, justifying and	using models which lead to a			
	defending models which lead	conclusion			
	to a conclusion				
	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		
	applying proportional	applying proportional	applying proportional	applying proportional	
	reasoning	reasoning	reasoning	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	lent devises a plan to apply	
	mathematics in solving problems arising in everyday life, society and the workplace by:				
	writing/using equations to	writing/using equations to	writing/using equations to	using equations to describe	
	describe how one quantity of	describe how one quantity of	describe how one quantity	how one quantity of interest	
	interest depends on another	interest depends on another	of interest depends on another	depends on another	
	using reasonable estimates of	using reasonable estimates of	using <b>reasonable</b> estimates	using unreasonable	
	known quantities in a chain of	known quantities in a chain of	of known quantities in a	estimates of known	
	reasoning that yields an	reasoning that yields an	chain of reasoning that	quantities in a chain of	
	estimate of an unknown	estimate of an unknown	yields an estimate of an	reasoning that yields an	
	quantity	quantity	unknown quantity	estimate of an unknown	
				quantity	
	interpreting mathematical	interpreting mathematical	interpreting mathematical		
	results in an applied context	results in an applied context	results in a simplified		
			context		
	determining whether results	determining whether results	determining whether		
	make sense	make sense	results make sense		
	improving a model if it has not	improving a model if it has not	altering a model if it has not		
	served its purpose	served its purpose	served its purpose		
	writing a complete, clear, and	writing a <b>complete, clear, and</b>	writing an incomplete	writing an incomplete	
	correct algebraic expression or	correct algebraic expression or	algebraic expression or	algebraic expression or	
	equation to describe a situation	equation to describe a situation	equation to describe a	equation to describe a	
			situation	situation	