LOUISIANA DEPARTMENT OF EDUCATION

Office of Assessments, Accountability, and Analytics

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 Proportional Relationships and Solve Problems 7.RP.A.1 7.RP.A.2 7.RP.A.3	Analyzes and uses proportional relationships to solve real-world and mathematical problems, including **multi-step** ratio/percent problems.	**Analyzes and** uses proportional relationships to solve real-world and mathematical problems, including simple ratio/percent problems.	**Uses** proportional relationships to solve **real-world and** mathematical problems, including **simple** ratio/percent problems.	Identifies proportional relationships to solve mathematical problems, including ratio/percent problems.
	Computes unit rates of quantities associated with ratios of fractions.	Computes unit rates of quantities associated with ratios of fractions.	**Computes unit rates of quantities associated with ratios of fractions.**	
	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality in tables, equations, diagrams, verbal descriptions, and graphs.	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality in tables, equations, diagrams, verbal descriptions, and graphs.	**Decides** whether two quantities are in a proportional relationship **and identifies the constant of proportionality in tables, equations, diagrams, verbal descriptions, and graphs.**	Identifies whether two quantities are in a proportional relationship.
	Interprets a point (x, y) on the graph of a proportional relationship in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	**Interprets a point (x, y) on the graph of a proportional relationship in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit 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 real-world 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 real-world problems, including ratio and percent problems.**	
	Determines when it is appropriate to use a unit rate and understands its limitations.			
Operations with Rational Numbers 7.NS.A.1 7.NS.A.2 7.NS.A.3 7.EE.B.3	Performs operations on positive and negative rational numbers in multi-step mathematical and real-world problems.	Performs operations on positive and negative rational numbers in **multi-step** mathematical and real-world problems.	Performs operations on positive and negative rational numbers in mathematical **and real-world problems.**	Performs operations on positive and negative rational numbers in mathematical problems.
	Represents addition and subtraction on a horizontal or vertical number line and recognizes situations in which opposite quantities combine to make zero.	Represents addition and subtraction on a horizontal or vertical number line and recognizes situations in which opposite quantities combine to make zero.	Represents addition and subtraction on a horizontal or vertical number line **and recognizes situations in which opposite quantities combine to make zero.**	Represents addition and subtraction on a horizontal or vertical number line.
	Determines reasonableness of a solution **and interprets solutions in real-world contexts.**	**Determines reasonableness of a solution.**		
	Understands subtraction of rational numbers as adding the additive inverse and the rules for multiplying/dividing positive and negative numbers.	**Identifies equivalent expressions of positive and negative rational numbers.**		

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

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

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

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 **complete**		In connection with the content knowledge and skills described in Major Content, the student constructs and communicates a	
LEAP.II.7.1 LEAP.II.7.2 LEAP.II.7.3 LEAP.II.7.4 LEAP.II.7.5 LEAP.II.7.6 LEAP.II.7.7	written response based on properties of operations; and the relationships between addition and subtraction and between multiplication and division			
	response based on concrete referents provided in the prompt or constructed by the student such as: diagrams that are connected to a written (symbolic) method, number line diagrams, or coordinate plane diagrams			
	response to a given equation, multi-step problem, proposition or conjecture			
	Responses may include:			
	a logical approach based on a conjecture and/or stated assumptions	a logical approach based on a conjecture and/or stated assumptions	a **logical** approach based on a conjecture and/or stated assumptions	a faulty approach based on a conjecture and/or stated assumptions
	a logical and complete progression of steps	a logical **and complete** progression of steps	a **logical**, but incomplete, progression of steps	an incomplete or illogical progression of steps
	precise calculation	**precise** calculation	**minor** calculation errors	major calculation errors
	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
	complete justification of a conclusion	**complete** justification of a conclusion	partial justification of a conclusion	partial justification of a conclusion
	generalization of an argument or conclusion			

Type II				
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 counter-examples where applicable**	evaluating, **interpreting, and critiquing** the validity of **responses, reasoning,** approaches, and conclusions	**evaluating the validity of approaches and conclusions**	
	identifying and describing errors in solutions and presenting correct solutions	identifying and describing errors in solutions **and presenting correct solutions**	**identifying and describing errors in solutions**	
	distinguishing correct and flawed reasoning and correcting flawed reasoning	**identifying and describing flaws in reasoning and presenting correct reasoning**		

Type III				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
	In connection with the content knowledge, skills, and abilities described in Major Content, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:			
LEAP.III.7.1 LEAP.III.7.2 LEAP.III.7.3 LEAP.III.7.4	using stated assumptions and making assumptions and approximations to simplify a real-world situation	using stated assumptions **or making assumptions** and approximations 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 limitations, **relationships, and interpreting goals** within a model	**creating limitations and goals within a model**		
	analyzing, justifying and defending models which lead to a conclusion	**using models which lead to a conclusion**		
	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
	applying proportional reasoning	applying proportional reasoning	applying proportional reasoning	applying proportional reasoning
	writing/using equations to describe how one quantity of interest depends on another	writing/using equations to describe how one quantity of interest depends on another	**writing**/using equations to describe how one quantity of interest depends on another	using equations to describe how one quantity of interest depends on another
	using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity	using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity	using **reasonable** estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity	using unreasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity

Type III				
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
	In connection with the content knowledge, skills, and abilities described in Major Content, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:			
	interpreting mathematical results in an applied context	interpreting mathematical results **in an applied context**	**interpreting mathematical results in a simplified context**	
	determining whether results make sense	determining whether results make sense	**determining whether results make sense**	
	improving a model if it has not served its purpose	**improving** a model if it has not served its purpose	**altering a model if it has not served its purpose**	
	writing a complete, clear, and correct algebraic expression or equation to describe a situation	writing a **complete, clear, and correct** algebraic expression or equation to describe a situation	writing an incomplete algebraic expression or equation to describe a situation	writing an incomplete algebraic expression or equation to describe a situation