Grade 7 Mathematics

Achievement level descriptions (ALDs) describe a student's level of achievement (e.g., Below Satisfactory, On-Grade-Level, Above Satisfactory) on a large-scale assessment. The purpose of the ALD development framework is to enable valid inferences about student content area knowledge and skill in relation to a state's content standards measured on a large-scale assessment.

Achievement Level	Achievement Level Descriptions
Level 1	Students performing at Level 1 are just beginning to access the challenging content of the B.E.S.T. Standards.
Level 2	Students at this level demonstrate a **below satisfactory** level of success with the challenging content of the *Florida B.E.S.T. Standards*. A student performing at Level 2: • applies the Laws of Exponents to identify equivalent numerical expressions, using whole number bases with whole number exponents. • identifies different but equivalent forms of rational numbers including fractions, mixed numbers, repeating decimals, and percentages to solve mathematical problems. • solves mathematical problems using order of operations of up to four steps with integers including grouping symbols, whole-number exponents, and absolute value. • adds, subtracts, multiplies, and divides positive rational numbers in the same form. • solves real-world problems involving one of the four operations with rational numbers in the same form and at least one number is negative. • applies properties of operations to add and subtract linear expressions with one term having a rational coefficient. • solves one-step inequalities in one variable within a mathematical context and represents solutions algebraically or graphically. • solves two-step equations in one variable within a mathematical context, where all terms are rational numbers of the same form. • identifies the ratios to solve real-world percent problems. • given the proportion involving whole numbers, applies ratios to solve real-world problems involving proportions having no conversions. • solves mathematical problems involving a single conversion of units across different measurement systems wherein the given measurement is a whole number. • determines whether two quantities have a proportional relationship by examining the relationship from a graph. • given a mathematical context, graphs proportional relationships from a table. • given any representation except a written description of a proportional relationship, translates the representation into a table or equation. • solves one-step real-world problems involving proportional relationships wherein the values are whole numbers. • identifies expressions that could be used to find the areas of trapezoids, parallelograms, or rhombi. • solves mathematical problems involving the area of regular polygons by decomposing them into triangles or quadrilaterals.

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Level 2	• explores the proportional relationship between circumferences and diameters of circles and identifies expressions that could be used for the circumference of a circle to solve mathematical problems when an image is given. • identifies an expression that could be used to find the area of a given circle. • identifies the scale factor in mathematical problems involving dimensions of geometric figures. • given a net in a mathematical or real-world context, determines the corresponding right circular cylinder, or, given the right circular cylinder, determines the corresponding net. • determines the expression that can be used to find the surface area for a given visual model with labeled dimensions for a right circular cylinder. • determines the expression that could be used to find the volume of right circular cylinders using a visual model. • identifies if the data set contains an outlier. • given two numerical representations of data, calculates the means, medians, and ranges and uses those measures to make comparisons between the two populations. • given categorical data from a random sample, identifies a ratio that describes the proportional relationship. • uses proportional reasoning to construct and display data of no more than four categories in circle graphs. • given a real-world numerical data set, chooses an appropriate graphical representation. • determines the sample space for a single experiment involving tossing a fair coin or rolling a fair die. • classifies a given probability of a chance event written as a percentage or decimal as likely or unlikely. • finds the theoretical probability of an event related to a simple experiment, which include tossing a fair coin or rolling a fair die, and expresses that probability as a fraction. • uses a simulation of a simple experiment to find experimental probabilities.
Level 3	Students at this level demonstrate **on-grade-level** success with the challenging content of the *Florida B.E.S.T. Standards*. A student performing at Level 3: • applies the Laws of Exponents to evaluate numerical expressions and identify equivalent numerical expressions, limited to whole-number exponents and rational number bases. • rewrites rational numbers in different but equivalent forms including fractions, mixed numbers, repeating decimals, and percentages to solve mathematical problems. • solves mathematical problems using multi-step order of operations with positive rational numbers, including grouping symbols, whole-number exponents, and absolute value. • adds, subtracts, multiplies, and divides rational numbers in the same form. • solves real-world problems involving one of the four operations with rational number and at least one number is a different form and at least one number is a negative.

Achievement Level	Achievement Level Descriptions
Level 3	• applies properties of operations to add and subtract linear expressions with more than one term having rational coefficients in the same form. • determines whether two linear expressions with rational coefficients in the same form are equivalent. • writes or solves one-step inequalities in one variable within a mathematical context and represents solutions algebraically or graphically. • writes or solves two-step equations in one variable within a mathematical context, where all terms are rational numbers of the same form. • identifies the ratios and applies the ratio to solve real-world percent problems. • applies ratios, involving whole numbers, to solve real-world problems involving proportions having no conversions. • solves mathematical problems involving the conversion of units across different measurement systems. • determines whether two quantities have a proportional relationship by examining a table or a graph. • determines the constant of proportionality within a mathematical context from a table or graph. • given a mathematical context, graphs proportional relationships from a table or equation. • given a written description of a proportional relationship, translates the representation into a table or equation. • solves one-step real-world problems involving proportional relationships wherein at least one value is a rational number. • applies formulas to find the areas of parallelograms and rhombi. • solves mathematical problems involving the area of polygons or composite figures by decomposing them into triangles or rectangles. • explores the proportional relationship between circumferences and diameters of circles and applies a formula for the circumference of a circle to solve mathematical problems. • applies a formula to find the area of a circle to solve mathematical problems. • solves mathematical problems involving dimensions and areas of geometric figures, including scale drawings and scale factors. • given a mathematical context, finds the surface area of a right circular cylinder given the figure's net. • solves real-world problems involving surface area of right circular cylinders using a visual model. • solves mathematical problems involving volume of right circular cylinders using a visual model. • determines an appropriate measure of center or measure of variation to summarize numerical data, represented graphically without outliers in a given context. • given two graphical representations of data, calculates and/or determines the measures of center or measures of variability and uses those measures to make comparisons and interpret results about the two populations. • given categorical data from a random sample, determines the ratio that can be used to make predictions about a population. • uses proportional reasoning to construct, display, and interpret data of no more than four categories in circle graphs.

Achievement Level	Achievement Level Descriptions
Level 3	• given a real-world numerical or categorical data set, chooses an appropriate graphical representation. • determines the sample space for a simple experiment with non-repeated elements (for example a bag containing 1 red marble, 1 green marble, and 1 yellow marble). • given the probability of a chance event, interprets the likelihood of it occurring and compares probabilities of chance events wherein the probabilities are given in the same form. • finds the theoretical probability of an event related to a simple experiment, which include tossing a fair coin, rolling a fair die, picking a card randomly from a deck, picking marbles randomly from a bag, and spinning a fair spinner, and expresses that probability as a fraction. • uses a simulation of a simple experiment to find experimental probabilities and compare them to theoretical probabilities, and expresses that probability as a fraction.
Level 4	Students at this level demonstrate an **above satisfactory** level of success with the challenging content of the Florida B.E.S.T. Standards. A student performing at Level 4: • applies the Laws of Exponents to evaluate numerical expressions and generate equivalent numerical expressions, limited to whole-number exponents and rational number bases. • rewrites rational numbers in different but equivalent forms including fractions, mixed numbers, repeating decimals, and percentages to solve real-world problems. • solves mathematical problems using multi-step order of operations with rational numbers including grouping symbols, whole-number exponents, and absolute value. • adds, subtracts, multiplies, and divides rational numbers in different forms with procedural fluency. • solves real-world problems involving more than one of the four operations with rational numbers and at least one number is a negative and/or at least one is a different form. • applies properties of operations to add and subtract linear expressions with rational coefficients. • determines whether two linear expressions are equivalent. • writes and solves one-step inequalities in one variable within a mathematical context and represents solutions algebraically and graphically. • writes and solves two-step equations in one variable within a mathematical or real-world context, where all terms are rational numbers. • solves multi-step real-world percent problems. • applies ratios, involving rational numbers, to solve real-world problems involving proportions. • solves mathematical or real-world problems involving multiple conversions of units across different measurement systems. • determines whether two quantities have a proportional relationship by examining any of these representations: table, graph, or written description.

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Level 4	• determines the constant of proportionality within a mathematical or real-world context from any of these representations: table, graph, or written description of a proportional relationship. • given a mathematical or real-world context, graphs proportional relationships from a table, equation, or written description. • given any representation of a proportional relationship, translates the representation into a written description. • solves multi-step real-world problems involving proportional relationships. • applies formulas to find the areas of trapezoids, parallelograms, and rhombi. • solves mathematical or real-world problems involving the area of polygons or composite figures by decomposing them into triangles and quadrilaterals. • explores the proportional relationship between circumferences and diameters of circles; applies a formula for the circumference of a circle to solve mathematical and real-world problems. • determines an appropriate measure of center or measure of variation to summarize numerical data, represented numerically or graphically, taking into consideration the context with outliers. • given two numerical or graphical representations of data, calculates and/or determines the measures of center and measures of variability and uses those measures to make comparisons, interpret results, and draw conclusions about the two populations. • given categorical data from a random sample, uses proportional relationships to make predictions about a population. • uses proportional reasoning to construct, display, and interpret data for up to six categories in circle graphs. • given a real-world numerical or categorical data set, chooses and creates an appropriate graphical representation. • determines the sample space for a simple experiment including repeated elements (such as a bag containing 2 red marbles, 1 green marble, and 3 yellow marbles). • given the probability of a chance event, interprets the likelihood of it occurring and compares probabilities of chance events wherein the probabilities are given in different forms. • finds the theoretical probability of an event related to a simple experiment, which include tossing a fair coin, rolling a fair die, picking a card randomly from a deck, picking marbles randomly from a bag, and spinning a fair spinner, and expresses that probability as a percentage and/or as a decimal. • uses a simulation of a simple experiment to find experimental probabilities and compare them to theoretical probabilities, and expresses that probability as a percentage and/or as a decimal.

Achievement Level	Achievement Level Descriptions
Level 5	Students at this level demonstrate **mastery** of the most challenging content of the *Florida B.E.S.T. Standards*. A student performing at Level 5: • applies the Laws of Exponents to evaluate numerical expressions and generate equivalent numerical expressions, limited to whole-number exponents and rational number bases, and provides justification. • rewrites rational numbers in different but equivalent forms including fractions, mixed numbers, repeating decimals, and percentages to solve mathematical and real-world problems, and provides justification for the form chosen. • analyzes an error in a mathematical problem using multi-step order of operations with rational numbers including grouping symbols, whole-number exponents, and absolute value, and justifies the reasoning. • solves real-world problems involving more than one of the four operations with rational numbers and interprets the solution in the context of the situation. • analyzes an error in applying the properties of operation to add and subtract linear expressions with rational coefficients and justifies the reasoning. • justifies why two linear expressions are or are not equivalent using properties of operations. • writes and solves one-step inequalities in one variable within a mathematical context, represents solutions algebraically and graphically, and interprets the solution in context of the situation. • writes and solves two-step equations in one variable within a real-world context, where all terms are rational numbers and interprets the solution in context of the situation. • solves multi-step real-world percent problems and interprets the solution in the context of the situation. • applies previous understanding of ratios to solve real-world problems involving proportions and interprets the solution in the context of the situation. • solves and interprets the solution in the context of the situation of real-world problems involving multiple conversions of units across different measurement systems. • determines whether two quantities have a proportional relationship by examining any of these representations: table, graph, or written description; for a proportional relationship, makes the connection between the constant of proportionality and explains that the ratio between the two quantities is a proportional relationship. • determines and interprets the constant of proportionality within a mathematical or real-world context from any of these representations: table, graph, or written description of a proportional relationship. • given a mathematical or real-world context, graphs proportional relationships from a table, equation or a written description and uses the graph, table, or equation to find any values in the proportional relationship. • given any representation of a proportional relationship, translates the representation to any of the following: written description, table, or equation and provides a justification for why the two representations show the same proportional relationship.

Achievement Level	Achievement Level Descriptions
Level 5	• solves real-world problems involving proportional relationships and interprets the solution in the context of the problem. • solves mathematical or real-world problems involving the area of multiple polygons or multiple composite figures by decomposing the shapes in different ways and showing how they are equivalent. • applies a formula for the circumference of a circle to solve mathematical and real-world problems, and interprets the solution in the context of the situation. • describes the relationship between the formula for the area of a rectangle and that of a circle; applies a formula to find the area of a circle to solve mathematical and real-world problems; and interprets the solution in the context of the situation. • solves mathematical or real-world problems involving dimensions and areas of geometric figures, including scale drawings and scale factors, and interprets the solution in context of the situation. • solves real-world problems involving surface area of right circular cylinders, and interprets the solution in the context of the situation. • solves mathematical or real-world problems involving volume of right circular cylinders, and interprets the solution in the context of the situation. • determines an appropriate measure of center or measure of variation to summarize numerical data, represented numerically or graphically, and compares the effect of the outlier on each measure of data. • given two numerical or graphical representations of data, calculates and/or determines the measures of center and measures of variability and uses those measures to make comparisons, interpret results, draw conclusions, and make predictions about the two populations. • given categorical data from a random sample, uses proportional relationships, make predictions and make suggestions for improving the likelihood of the prediction. • given a real-world numerical or categorical data set, chooses, creates, and justifies an appropriate graphical representation. • analyzes an error in finding the theoretical probability of an event related to a simple experiment and justifies the reasoning. • uses a simulation of a simple experiment to find experimental probabilities and compare them to theoretical probabilities, and expresses that probability as a percentage, fraction, and/or as a decimal, and explains the relationship between the number of trials of an experiment and its theoretical probability.