DEPARTMENT of EDUCATION
Louisiana Believes

Practice Test Item Analysis
Grade 6

This Item Analysis is provided so that teachers, parents, and students may gain a better understanding of the Grade 6 iLEAP math test structure and the Common Core State Standards (CCSS) as applied to assessment. The table below is organized by practice test sequence number, CCSS, rationale for alignment, and connection to the practice test. The CCSS is the standard to which the item is aligned. The rationale for alignment explains an item's alignment to the standard listed. The language of the standards, any clarifications and/or tables offered by the CCSS, and the progression documents published by the University of Arizona were used when aligning items to the CCSS. The final column highlights specific qualities in each practice test item which adhere the rationale for alignment. The practice test can be found here, and a detailed explanation of assessment structure can be found here.

Sequence Number	CCSS	Rationale for Alignment	Connection to the Practice Test
1	6.NS.B.3	Language of the standard: "Fluently add, multi-digit decimals using the standard algorithm."	Add $8.64+7.098+10.9901$.
2	6.NS.C.7b	Language of the standard: "Write statements of order for rational numbers in real-world contexts." Progression Document *6-8, The Number System*, pages 7-8	Correctly order the rational numbers $-7, -4, 0, 7$ from least to greatest using symbolic notation.
3	6.EE.A.4	Language of the standard: "Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them)." Progression Document *6-8, Expressions and Equations*, page 6	Recognize the equation as not true; the expressions are not equivalent. Identify the correct explanation for this inequality of expressions.
4	6.NS.B.2	Language of the standard: "Fluently divide multi-digit numbers using the standard algorithm."	Identify the next step in using the standard algorithm to divide 1,806 by 24.
5	6.NS.B.3	Language of the standard: "Fluently multiply multi-digit decimals using the standard algorithm."	Multiply 6.23×9.3.
6	6.SP.A.1	Language of the standard: "Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers." Similar to example given in the standard.	Identify the correct statistical question as the one that anticipates variability.

7	6.NS.C.5	Language of the standard: "Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts." Progression Document *6-8 The Number System*, pages 7-8	Recognize 10 as being the same distance from 0 as -10.
8	6.NS.C.6b	Language of the standard: "Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes."	Recognize the reflection across the x-axis of ordered pair $(4,-3)$ as $(4,3)$.
9	6.EE.A.2c	Language of the standard: "Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order."	Evaluate the expression $100\left(x^3+x^2+x\right)$ when $x=2$.
10	6.NS.C.7b	Language of the standard: "Write statements of order for rational numbers in real-world contexts." Progression Document *6-8, The Number System*, pages 7-8	Correctly order the rational numbers $\frac{1}{5}, \frac{11}{40}$, and $\frac{1}{4}$ from least to greatest using symbolic notation.
11	6.NS.A.1	Language of the standard: "Compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models." Progression Document *6-8, The Number System*, pages 5-6	Divide $1\frac{1}{3}$ by $\frac{2}{9}$. A visual fraction model is provided, but use is not required to solve the word problem.
12	6.EE.B.5	Language of the standard: "Understand solving an inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true." Progression Document *6-8, Expressions and Equations*, pages 6-7.	Recognize the solution to the $4x \le 34$ as 8 or fewer boxes.

13	6.NS.C.6c	Language of the standard: "Find and position rational numbers on a horizontal number line diagram."	Identify the number line with 0.6, 0.85, 0.9, and 1.0 correctly positioned.
14	6.SP.A.2	Language of the standard: "Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape." Progression Document *6-8, Statistics and Probability*, pages 4-6	Describe the data distribution of the numerical data set displayed in the line plot in terms of the context. This involves knowledge of distribution by quartiles.
15	6.NS.A.1	Language of the standard: "Compute quotients of fractions, and solve word problems involving division of fractions by fractions." Similar to the example given in the standard. Progression Document *6-8, The Number System*, pages 5-6	Divide $\frac{1}{4}$ by $\frac{2}{3}$ to solve the word problem.
16	6.NS.C.6c	Language of the standard: "Find and position integers on a horizontal number line diagram."	Identify the number line with 3.4, -2.1, and -0.6 correctly positioned.
17	6.EE.A.4	Language of the standard: "Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them)." Progression Document *6-8, Expressions and Equations*, page 6	Identify $2y \times 4$ and $2 \times 4y$ as equivalent expressions.
18	6.NS.C.8	Language of the standard: "Solve mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same second coordinate."	Identify $P(-2,3)$ and $Q(4,3)$ as having a distance of exactly 6 units from each other.
19	6.EE.B.8	Language of the standard: "Write an inequality of the form $x < c$ to represent a constraint or condition in a real-world problem."	Recognize the inequality $s \leq 45$ as "a maximum of 45" where s is the speed of the scooter.
20	6.RP.A.1	Language of the standard: "Understand the concept of a ratio."	Identify the picture which models the ratio 8:4 or 2:1.
21	6.NS.B.2	Language of the standard: "Fluently divide multi-digit numbers using the standard algorithm."	Divide 1,000 by 16.

22	6.EE.A.2c	Language of the standard: "Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order."	Evaluate the expression $6h+30$ when *h* is 32.
23	6.NS.C.8	Language of the standard: "Solve real-world and mathematical problems by graphing points. Include use of coordinates and absolute value to find distances between points with the same second coordinate."	Identify (0, 5) as being 4 units from (4, 5).
24	6.EE.B.6	Language of the standard: "Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number."	Given the expression $2p+5$, identify the correct verbal expression.
25	6.NS.C.6c	Language of the standard: "Find and position rational numbers on a horizontal number line diagram."	Recognize $\frac{19}{20}$ as less than 1, but greater than $\frac{8}{9}$.
26	6.EE.A.3	Language of the standard: "Apply the properties of operations to generate equivalent expressions." Progression Document *6-8, Expressions and Equations*, pages 5-6	Recognize $6h-21$ as equivalent to $(h-21)+5h$.
27	6.G.A.3	Language of the standard: "Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems."	Given coordinates (3, 2) and (8, 6), determine the other coordinate points to complete the square. Determine the area of the square.
28	6.EE.A.3	Language of the standard: "Apply the properties of operations to generate equivalent expressions." Progression Document *6-8, Expressions and Equations*, pages 5-6	Recognize the expression $4(2x+10y)$ as equivalent to $8(x+5y)$.
29	6.NS.B.3	Language of the standard: "Fluently subtract, multi-digit decimals using the standard algorithm."	Subtract $4.2-0.25$.

30	6.EE.A.2c	Language of the standard: "Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order."	Evaluate the expression $6x^2 + 9x + 3$ when x is 3.
31	6.G.A.4	Language of the standard: "Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems."	Determine the surface area of the net of the square pyramid.
32	6.RP.A.3b	Language of the standard: "Solve unit rate problems including those involving unit pricing and constant speed."	Calculate the unit rate (miles per gallon) of each car and identify the car with the highest unit rate.
33	6.EE.B.5	Language of the standard: "Understand solving an inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true."	Use substitution to identify {29, 43, 59} as a solution set of the inequality $0.08g + 0.2 < 5$.
34	6.SP.B.5c	Language of the standard: "Summarize numerical data sets in relation to their context, such as by: Giving quantitative measures of center (median and/or mean)."	Given the median, 20, and mean, 21, determine which set of data they summarize.
35	6.NS.C.7	Language of the standard: "Understand ordering and absolute value of rational numbers."	Recognize $\lvert -5\% \rvert < \frac{1}{2}$ as the only correct comparison.
36	6.G.A.1	Language of the standard: "Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems."	Determine the area of the trapezoid shown.
37	6.SP.B.4	Language of the standard: "Display numerical data in plots on a number line, including histograms."	Identify the histogram which correctly displays the numerical data given.

38	6.G.A.1	Language of the standard: "Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems."	Determine the area of the polygon shown.
39	6.G.A.2	Language of the standard: "Apply the formulas $V = l\ w\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems."	Determine the volume of the right rectangular prism with fractional edge lengths described in the real-world problem.
40	6.NS.C.7b	Language of the standard: "Write, interpret, and explain statements of order for rational numbers in real-world contexts." Similar to example given in the standard. Progression Document *6-8, The Number System*, pages 7-8	Recognize that the integer -8 is graphed to the left of -5 when reading a number line from left to right. Describe the position of -8 in terms of the context; specifically, Lauren arriving before Ellie. "At what point," is an attempt to connect a point on a number line to a point in time.
41	6.G.A.3	Language of the standard: "Draw polygons in the coordinate plane given coordinates for the vertices."	Given the coordinates $(-5,-3)$ and $(2,8)$, complete the rectangle by finding the other coordinates $(2,-3)$ and $(-5,8)$.
42	6.SP.A.2	Language of the standard: "Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape."	Describe the center of the data collected by identifying the mean.
43	6.EE.B.7	Language of the standard: "Solve real-world and mathematical problems by writing equations of the form $px = q$ for cases in which p, q and x are all nonnegative rational numbers."	Given a real-world word problem, identify the equation $3r = s$ as the correct equation to solve the problem.
44	6.SP.A.3	Language of the standard: "Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number."	For the given numerical data set, compare the mean, median, and range.

45	6.EE.B.8	Language of the standard: "Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams."	Determine the constraint of the real-world problem. Identify the number line with the correct solution to the inequality.
46	6.RP.A.1	Language of the standard: "Understand the concept of a ratio."	Identify 12:4 as equivalent to 6:2.
47	6.EE.C.9	Language of the standard: "Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation."	Identify $y = 3x + 1$ as the equation that describes the relationship between x and y in the table shown.
48	6.G.A.1	Language of the standard: "Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems."	Find the area of the polygon shown.
49	6.EE.B.7	Language of the standard: "Solve real-world problems by writing and solving equations of the form $px = q$ for cases in which p, q and x are all nonnegative rational numbers."	Solve the problem by writing the equation $3d = c$ and determining the values for c and d which make the equation true.
50	6.SP.A.2	Language of the standard: "Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape." Progression Document *6-8, Statistics and Probability*, pages 4-6	Describe the data distribution of the numerical data set displayed in the frequency table in terms of the context. This involves knowledge of distribution by quartiles
51	6.RP.A.3b	Language of the standard: "Solve unit rate problems including those involving unit pricing and constant speed." Progression Document *6-7, Ratios and Proportional Relationships*, pages 2-4	Determine the unit rate (price per gallon) for 6 gallons of milk at $28.14.

52	6.G.A.2	Language of the standard: "Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems."	Find the volume of the right rectangular prism with fractional edge lengths shown in the word problem.
53	6.RP.A.2	Language of the standard: "Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship." Similar to example given in the standard. Progression Document *6-7, Ratios and Proportional Relationships*, pages 2-4	Using the ratio relationship 0.72 of a pound of almonds for $4.68, find the cost ratio for 1 pound of almonds. Note: According to footnote 1, "Expectations for unit rates in this grade are limited to non-complex fractions." The footnote is not specific in limiting to whole number numerators and denominators, like in other standards. Complex fractions are generally understood to have stacked fractions in the numerator and/or denominator, addressed in 7.RP.1. Students are expected to fluently divide decimals and express unit cost in grade 6. This item is in the calculator session since it is not intended to assess fluency.
54	6.EE.C.9	Language of the standard: "Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation."	Identify $y = 2x + 8$ as the equation that describes the relationship between x and y in the table shown.
55	6.G.A.4	Language of the standard: "Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems."	Identify the rectangular prism with a surface area of 78 square units.

56	6.NS.B.4	Language of the standard: "Find the least common multiple of two whole numbers less than or equal to 12."	Find the least common multiple of 9 and 12.
57	6.RP.A.1	Language of the standard: "Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities."	Recognize the ratio of "burnt-out light bulbs to working light bulbs" as 5:7.
58	6.EE.B.6	Language of the standard: "Use variables to represent numbers and write expressions when solving a real-world or mathematical problem."	Use the information in the word problem to write the expression $\frac{x-y}{8}$.
59	6.G.A.1	Language of the standard: "Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems."	Find the area of the second polygon shown based on the area of the first polygon shown.
60	6.NS.C.5	Language of the standard: "Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts."	In terms of the described context, recognize that the integer -40 represents 40 feet below sea level.
61	6.RP.A.3	Language of the standard: "Use ratio and rate reasoning to solve real-world and mathematical problems. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent."	Label the circles shown according to the corresponding percentages. Identify the ratio of dimes to pennies. Describe the affect on the ratio of dimes to pennies in terms of adding more quarters to the jar.
62	6.EE.A.1	Language of the standard: "Write and evaluate numerical expressions involving whole-number exponents."	Write a numerical expression using a whole-number exponent greater than 1 to represent a quantity. (Parts A and B). Write and explain equivalent expressions involving whole-number exponents.