DEPARTMENT of EDUCATION
Louisiana Believes

Practice Test Item Analysis
Grade 4

This Item Analysis is provided so that teachers, parents, and students may gain a better understanding of the Grade 4 LEAP 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	4.NF.C.6	Language of the standard: "Use decimal notation for fractions with denominators 10 or 100."	Write a fraction with denominator 100 as a decimal.
2	4.OA.A.2	Language of the standard: "Divide to solve word problems involving multiplicative comparison." Progression document *K-5, Operations and Algebraic Thinking*, page 23, Table 3 and page 29.	Divide 28 by 7 to determine that there are 4 times as many days in the month as there are in one week.
3	4.NBT.B.5	Language of the standard: "Multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations." Progression document *K-5, Number and Operations in Base Ten*, pages 13-14	Multiply 46×12 using a strategy based on place value and the distributive property, illustrated as an equation.
4	4.NBT.B.4	Language of the standard: "Fluently add and subtract multi-digit whole numbers using the standard algorithm."	Add $46,911 + 653,092$.
5	4.NF.C.6	Language of the standard: "Use decimal notation for fractions with denominators 10 or 100."	Write a fraction with denominator 10 as a decimal.
6	4.NF.C.5	Language of the standard: "Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100." Similar to example given in the standard.	Express $\frac{4}{10}$ as $\frac{40}{100}$. Add $\frac{37}{100} + \frac{40}{100}$.

7	4.G.A.2	Language of the standard: "Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines."	Classify a group of shapes where each shapes has at least one pair of parallel sides and at least one pair of perpendicular sides.
8	4.OA.A.2	Language of the standard: "Multiply to solve word problems involving multiplicative comparison, e.g., by using equations with a symbol for the unknown number to represent the problem." Progression document *K-5, Operations and Algebraic Thinking*, page 23, Table 3 and footnotes.	Recognize 4 cm is 4 times as many as 1 cm, so the number of pennies would be 4 times as many as 7. Write the equation showing multiplicative comparison with symbol, *n*, for the unknown number to represent the problem.
9	4.NF.A.2	Language of the standard: "Compare two fractions with different numerators and different denominators."	Compares $\frac{1}{2}$ and $\frac{2}{3}$ from the same whole for correct answer. Other answer choices compare different fractions (2 at a time) incorrectly.
10	4.NBT.B.6	Language of the standard: "Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors."	Find the whole-number quotient and remainder of 7,285 divided by 4.
11	4.NF.C.6	Language of the standard: "Use decimal notation for fractions with denominators 10 or 100."	Write a decimal as a fraction with a denominator of 100.
12	4.NBT.B.4	Language of the standard: "Fluently add and subtract multi-digit whole numbers using the standard algorithm."	Subtract $2,396 - 1,709$.
13	4.NF.A.2	Language of the standard: "Recognize that comparisons are valid only when the two fractions refer to the same whole. Justify the conclusions, e.g., by using a visual fraction model."	Fractions are not equivalent because they have a different number of parts, not because one shape is large than the other.
14	4.OA.B.4	Language of the standard: "Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number"	Find a whole number which is a multiple of 5, 3, and 2.
15	4.NBT.A.1	Language of the standard: "Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right."	Recognize that 7 in the hundreds place is ten times greater than 7 in the tens place.

16	4.OA.A.2	Language of the standard: "Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using equations with a symbol for the unknown number to represent the problem." Progression document *K-5, Operations and Algebraic Thinking*, page 23, Table 3 and footnotes.	Divide 72 by 6 to calculate the number of horses, 12, that would be 6 times as many cows. Represented in equation with symbol, *h*, to indicate the number of horses.
17	4.NF.B.4b	Language of the standard: "Understand a multiple of *a/b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number." Progression document *3-5, Number and Operations—Fractions*, pages 7-8.	Multiply $4 \times \frac{2}{3}$. Correct answer is a model of the fraction $\frac{1}{3}$ added 8 times to represent 8 thirds.
18	4.NBT.B.4	Language of the standard: "Fluently add and subtract multi-digit whole numbers using the standard algorithm."	Subtract $1,027 - 988$.
19	4.NF.C.6	Language of the standard: "Use decimal notation for fractions with denominators 10 or 100."	Write a fraction with denominator 10 as a decimal.
20	4.NF.C.5	Language of the standard: "Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100." Similar to example given in the standard.	Express $\frac{2}{10}$ as $\frac{20}{100}$. Add $\frac{59}{100} + \frac{20}{100}$.
21	4.OA.B.4	Language of the standard: "Find all factor pairs for a whole number in the range 1–100."	Find one factor of 38.
22	4.NBT.B.5	Language of the standard: "Multiply two two-digit numbers."	Multiply 31×45.
23	4.NF.C.7	Language of the standard: "Recognize that comparisons are valid only when the two decimals refer to the same whole. Justify the conclusions, e.g., by using a visual model."	Recognize that the two decimals cannot be compared because the triangles differ in size, so the decimals do not represent the same whole.
24	4.NF.A.2	Language of the standard: "Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole"	Given the fraction $\frac{6}{12}$, find a larger fraction of different numerator and denominator, and referring to the same whole.

25	4.OA.A.1	Language of the standard: "Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations."	Recognize that $14 \times 3 = 42$ is the same as the sentence "42 is 3 times as many as 14."
26	4.NF.A.2	Language of the standard: "Recognize that comparisons are valid only when the two fractions refer to the same whole… and justify the conclusions, e.g., by using a visual fraction model."	Fractions are not equivalent even though they have the same number of parts. Recognize that the reason for non-equivalence is not the fact that Model A is a pentagon and Model B is a square; it is because Model A is not partitioned equally.
27	4.OA.C.5	Language of the standard: "Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself."	Following the rule "add 11," recognize that the numbers in the pattern alternate odd/even, so no two even numbers will be adjacent.
28	4.NBT.A.2	Language of the standard: "Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form."	Write number eighteen thousand ninety-six in expanded form $10,000 + 8,000 + 90 + 6$.
29	4.NF.B.4c	Language of the standard: "Solve word problems involving multiplication of a fraction by a whole number."	Multiply $\frac{4}{5}$ by 6.
30	4.NF.B.4b	Language of the standard: "Understand a multiple of *a/b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number." Similar to example given in the standard.	Recognize $4 \times \frac{4}{3}$ as $\frac{16}{3}$ using a visual fraction model.
31	4.OA.A.1	Language of the standard: "Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations."	Recognize the multiplicative comparison of "2 times as many" as the multiplication equation $16 = 2 \times 8$.
32	4.NBT.A.2	Language of the standard: "Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form."	Read expanded form of $300,000 + 5,000 + 600 + 10$ and write in standard form of 305,610.

33	4.NBT.A.1	Language of the standard: "Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right"	Recognize that 7 in the thousands place is 10 times greater than the 7 in the hundreds place to be the same as the 7 in the hundreds place is 10 times less than the 7 in the thousands place.
34	4.OA.A.1	Language of the standard: "Represent verbal statements of multiplicative comparisons as multiplication equations."	Recognize $7 \times 3 = 21$ as the multiplication equation that represents the verbal statement 21 is how many times more than 7.
35	4.NBT.B.5	Language of the standard: "Multiply a whole number of up to four digits by a one-digit whole number, using strategies based on place value and the properties of operations."	Recognize the expression $(7 \times 3,000) + (7 \times 90) + (7 \times 2)$ as a way to correctly multiply the expression $3,092 \times 7$.
36	4.NF.A.2	Language of the standard: "Compare two fractions with different numerators and different denominators, e.g., by comparing to a benchmark fraction such as ½. Record the results of comparisons with symbols >, =, or <, and justify the conclusions."	Compare $\frac{3}{4}$ and $\frac{9}{10}$ using symbols. Base this comparison on the benchmark fraction $\frac{4}{5}$.
37	4.G.A.2	Language of the standard: "Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines."	Recognize the only shape with both parallel and perpendicular lines.
38	4.MD.A.1	Language of the standard: "Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit." Similar to example given in the standard.	Recognize 4 yards is equivalent to 12 feet.
39	4.NBT.A.2	Language of the standard: "Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form."	Recognize 179,912 written in word form one hundred seventy-nine thousand nine hundred twelve.
40	4.NF.A.1	Language of the standard: "Recognize and generate equivalent fractions."	Recognize $\frac{9}{15}$ as equivalent to the model showing $\frac{3}{5}$ shaded.

41	4.MD.B.4	Language of the standard: "Solve problems involving addition and subtraction of fractions by using information presented in line plots." Similar to example given in the standard. Progression document *Grades 2-5 Measurement Data*, pages 10-11.	Recognize each x on the line plot as an instance of that fraction of an hour occurring, for example 5 x's above $\frac{1}{4}$ indicate that Anna practiced 5 of the 11 times for $\frac{1}{4}$ of an hour each. Add all the values to determine the total amount of practice hours over the 11 days.
42	4.NBT.A.3	Language of the standard: "Use place value understanding to round multi-digit whole numbers to any place."	Round 2,448 to the nearest thousand, 2,000.
43	4.G.A.2	Language of the standard: "Classify two-dimensional figures based on the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles."	Identify the triangle as a right triangle and categorize only in group containing right triangles.
44	4.MD.A.2	Language of the standard: "Use the four operations to solve word problems involving liquid volumes, including problems that require expressing measurements given in a larger unit in terms of a smaller unit."	Convert the 12 pints into cups by multiplying, and then divide the number of cups by 3 to determine the number of days.
45	4.NF.C.7	Language of the standard: "Recognize that comparisons are valid only when the two decimals refer to the same whole."	Recognize that the decimals cannot be compared because they refer to two different classes and the class sizes are unknown.
46	4.MD.C.7	Language of the standard: "Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems."	Add $16+80$, and then subtract the sum from 180 to find the unknown measure.
47	4.G.A.1	Language of the standard: "Identify these (angles) in two-dimensional figures."	Identify the shape with two obtuse angles.
48	4.MD.A.2	Language of the standard: "Use the four operations to solve word problems involving intervals of time, including problems involving simple fractions, and problems that require expressing measurements given in a larger unit in terms of a smaller unit."	Convert $1\frac{1}{2}$ hours to minutes, and then multiply those minutes by 3 to find the total game minutes. Add total game minutes, 15 minutes arrival time, 5 minutes twice for each intermission, and 10 minutes time after the last game.

49	4.MD.A.2	Language of the standard: "Use the four operations to solve word problems involving money, including problems involving simple decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit."	Convert all money to only nickels, and then divide by 2.
50	4.MD.A.3	Language of the standard: "Apply the area and perimeter formulas for rectangles in real world and mathematical problems." Progression document *K-5, Geometric Measurement*, pages 21-22.	Given the perimeter and one side length, find the width.
51	4.MD.C.5	Language of the standard: "An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles."	Recognize that a 3 degree angle is equivalent to $\frac{1}{360}+\frac{1}{360}+\frac{1}{360}$.
52	4.G.A.3	Language of the standard: "Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts."	Recognize a correct line of symmetry for a two-dimensional figure.
53	4.G.A.1	Language of the standard: "Identify these (angles) in two-dimensional figures."	Identify a right angle.
54	4.OA.A.3	Language of the standard: "Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations."	Divide 22 by 2, and then subtract 3.
55	4.MD.A.3	Language of the standard: "Apply the area and perimeter formulas for rectangles in real world and mathematical problems." Progression document *K-5, Geometric Measurement*, pages 21-22.	Apply the area and perimeter formula to find which rectangle has an area value half the perimeter value.
56	4.NBT.A.3	Language of the standard: "Use place value understanding to round multi-digit whole numbers to any place."	Recognize 4,530,000 as 4,533,372 rounded to the nearest ten-thousand.
57	4.MD.C.6	Language of the standard: "Measure angles in whole-number degrees using a protractor."	Measure angle H, approximately 30°.

58	4.NF.A.1	Language of the standard: "Use this principle to recognize and generate equivalent fractions."	Recognize the model of $\frac{3}{6}$ as equivalent to the number line showing $\frac{2}{4}$.
59	4.G.A.3	Language of the standard: "Identify line-symmetric figures."	Identify the figure having no lines of symmetry apart from the figures having at least one line of symmetry.
60	4.MD.A.3	Language of the standard: "Apply the area and perimeter formulas for rectangles in real world and mathematical problems."	Find the area of a rectangle with the dimensions 6 feet by 7 feet.
61	4.NBT.B.6	Language of the standard: "Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models."	Given quotient, remainder, and divisor. Determine the dividend. Given a new dividend, determine the quotient and remainder. Using quotient and remainder, regroup for even distribution.
62	4.NF.B.3	Language of the standard: "Understand a fraction *a/b* with *a* > 1 as a sum of fractions 1/*b*. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way. Justify decompositions, e.g., by using a visual fraction model. c. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Decompose $\frac{4}{4}$ into a sum of fractions, $\frac{1}{4}$, using a visual fraction model. (3a) Complete the same task, using a different visual fraction model. (3b) Add unit fractions to determine correct denominator. (3d) Solve the problem by adding and/or subtracting fractions referring to the same whole and having like denominators, using a visual fraction model. (3d)

63	4.OA.A.3	Language of the standard: "Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted." PARCC notes that when assessing a standard requiring more than one step using a constructed-response item, *each part* must be more than one step for the whole item to align to the standard.	Multiply $16 \times 5 \times 4$. Multiply 16×5, and then divide by 3. Interpret the remainder as the amount not being used in a full bag. Add $3+12$, and then subtract the sum from 16. Multiply the difference by 26.