Session	Sequence	Кеу	Assessable Content
1	1	143	5.0A.A.1
-	-	145	expressions with these symbols.
1	2	D	5.NBT.A.3a Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
1	3	С	5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2$ = $3/7$, by observing that $3/7 < 1/2$.
1	4	С	5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.
1	5	D	5.NF.B.5b Interpret multiplication as scaling (resizing), by: explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.
1	6	A	5.MD.C.5b Apply the formulas $V = I \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
1	7	В	5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
1	8	D	5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

The Grade 5 Mathematics Practice Test and Scoring Guide have been updated to accurately reflect the LEAP test design. Item #41, previously a Type III task worth 3 points, has been replaced with a Type III task worth 6 points.

Session	Sequence	Кеу	Assessable Content
1	9	A	5.NF.B.4b Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
1	10	Part A: A Part B: D	5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
1	11	See rubric	Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in Sub-claim A. 5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. 5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the</i> <i>calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 ×</i> <i>(18932 + 921) is three times as large as 18932 + 921, without having to calculate</i> <i>the indicated sum or product.</i>
1	12	Part A: C Part B: 75*	5.MD.C.5c Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non- overlapping parts, applying this technique to solve real world problems. *Scorer should follow student work from part A to part B. Part B can receive credit if an incorrect response in part A is used correctly in part B.
1	13	В	 5.MD.C.3b A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. Base arithmetic explanations/reasoning on concrete referents such as diagrams (whether provided in the prompt or concruting by the student in her recognized).
1	14	See rubric	 5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.

Session	Sequence	Key	Assessable Content
2	15	D	5.NBT.A.4 Use place value understanding to round decimals to any place.
2	16	В	5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
2	17	B, C, F	5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., <i>x</i> -axis and <i>x</i> -coordinate, <i>y</i> -axis and <i>y</i> -coordinate).
2	18	D	5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.
2	19	D	5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2$ = $3/7$, by observing that $3/7 < 1/2$.
2	20	D	5.MD.C.5b Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
2	21	100	5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Session	Sequence	Кеу	Assessable Content
2	22	Part A: D Part B: C	5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2$ = $3/7$, by observing that $3/7 < 1/2$.
2	23	See rubric	Distinguish correct explanation/reasoning from that which is flawed, and – if there is a flaw in the argument – present corrected reasoning. (For example, some flawed 'student' reasoning is presented and the task is to correct and improve it.) 5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <i>For</i> <i>example</i> , $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
2	24	162	5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.
2	25	A	5.NF.B.7c Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, how</i> <i>much chocolate will each person get if 3 people share 1/2 lb. of chocolate</i> <i>equally? How many 1/3-cup servings are in 2 cups of raisins?</i>
2	26	4.875	5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
2	27	Part A: 480 Part B: 3	5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
2	28	See rubric	Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in Sub-claim A. 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.
3	29	75.3	5.NBT.A.4

Session	Sequence	Кеу	Assessable Content
3	30	С	5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
3	31	с	5.NF.B.4a Interpret the product $(a / b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$).
3	32	D	5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2$ = $3/7$, by observing that $3/7 < 1/2$.
3	33	A	5.MD.C.3a A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
3	34	A	5.NF.B.3 Interpret a fraction as division of the numerator by the denominator ($a / b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?
3	35	81	5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.
3	36	В	5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Session	Sequence	Кеу	Assessable Content
3	37	D	5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole- number exponents to denote powers of 10.
3	38	С	5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
3	39	С	5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.
3	40	А	5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties
3	41	See rubric	Solve multi-step contextual problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in 4.OA, 4.NBT, 4.NF, 4.MD. 4.MD.A.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given</i> <i>the area of the flooring and the length, by viewing the area formula as a</i> <i>multiplication equation with an unknown factor.</i>
3	42	See rubric	Base explanations/reasoning on a number line diagram (whether provided in the prompt or constructed by the student in her response). 5.NF.B.7a Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. 5.NF.B.7b Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.

	#11 Part A
Score	Description
1	Student response includes the following element.
	 Modeling component = 1 point
	 Correct expression for the cost of the bracelet
	Sample Student Response:
	$0.05 \times 25 + 0.45 \times 4$
	Note: Any valid expression can receive credit.
0	Student response is incorrect or irrelevant.

Part B

Score	Description
1	Student response includes the following element.
	 Modeling component = 1 point
	 Correct expression for the cost of the necklaces
	Sample Student Response:
	$(0.05 \times 48 + 0.45 \times 1) \times 2$
	Note: Any valid expression can receive credit.
0	Student response is incorrect or irrelevant.

	Part C
Score	Description
1	Student response includes the following element.
	 Computation component = 1 point
	 Correct amount of money Katie had left after purchasing
	her supplies
	Sample Student Response:
	\$31.25
0	Student response is incorrect or irrelevant.

#14					
Score	Description				
	Student response contains the following 4 elements:				
	 Computation component: Correct numbers for each letter in the model Reasoning component: Valid explanation for finding the numbers in the model Computation Component: Correct value for quotient, 873 remainder 2 Reasoning component: Valid explanation or work to show multiplication check 				
4	Sample Student Response				
+	The value of <i>M</i> is 6,400 because $8 \times 800 = 6,400$. The value of <i>N</i> is 70 because $8 \times 70 = 560$. Then $6,400 = 560 = 6,960$. So there are 26 left. Since $8 \times 3 = 24$, the value of <i>P</i> is 3 and the value of <i>Q</i> is 24. There are 2 left over, so <i>R</i> is 2.				
	The value of 6,986 \div 8 is 873 with a remainder of 2.				
	To check by multiplication, first multiply 873 by 8. Then add 2 to the product. 873 × 8 = 6,984 6,984 + 2 = 6,986				
3	Student response includes 3 of the 4 elements. If a student has a computation error, points can still be awarded for correct reasoning.				
2	Student response includes 2 of the 4 elements. If a student has a computation error, points can still be awarded for correct reasoning.				
1	Student response includes 1 of the 4 elements. If a student has a computation error, points can still be awarded for correct reasoning.				
0	Student response is incorrect or irrelevant.				

	#23
Score	Description
3	 Student response includes each of the following 3 elements. Reasoning component = 2 points
	 Identification of Leah's mistake
	• Correct work shown for adding $\frac{2}{3} + \frac{1}{2} + \frac{5}{12}$
	 Computation component = 1 point
	• Correct value of $\frac{2}{3} + \frac{1}{2} + \frac{5}{12}$, $\frac{19}{12}$ or equivalent
	Sample Student Response: Leah used the wrong numerators. To add fractions with different denominators, you have to find the common denominator. Then you convert each fraction to an equivalent fraction using the common denominator. Then you add the numerators together and put the result as the numerator. $\frac{2}{3} + \frac{1}{2} + \frac{5}{12}$ $= \frac{8}{12} + \frac{6}{12} + \frac{5}{12}$ $= \frac{8+6+5}{12}$ $= \frac{19}{12}$
2	Student response includes 2 of the 3 elements.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

#28				
Score	Description			
3	Student response includes the following 3 elements.			
	 Modeling component = 2 points 			
	 Correct explanation of how to use the model to find the 			
	size of each section of the garden.			
	 Correct use of common denominators to write an 			
	equation to find the difference between the two sections			
	or the garden.			
	• Computation component = 1 point			
	o The student mus now many square yards larger the pea			
	Sample Student Response:			
	Since there are 16 squares in the first half of the model and 3			
	are shaded, this means that the area of the carrot section is			
	$\frac{3}{16}$ square yard. Since there are 4 squares in the second half of			
	the model and 1 is shaded, this means that the area of the pea			
	soction is ¹ square yard			
	4 square yard.			
	$\frac{4}{1} - \frac{3}{1} = \frac{1}{1}$			
	16 16 16			
	1			
	<u>—</u> square yard			
	Notes:			
	 A variety of explanations are possible. As long as the 			
	explanation shows a clear understanding of using the model to			
	find the size of each section, credit should be awarded.			
	 A variety of equations are possible. As long as the equation can 			
	be used to represent the problem, credit should be awarded.			
	o II a student uses the model for peas and divides it into			
	student should be awarded both modeling points since the			
	modeling for two steps was completed in one step.			
2	Student response includes 2 of the 3 elements.			
1	Student response includes 1 of the 3 elements.			
0	Student response is incorrect or irrelevant.			

#41 Part A			
Score	Description		
	Student response includes each of the following 2 elements:		
2	 Computation component: 486 square feet Modeling component: 18 × 27 = g 		
1	Student response contains 1 of the 2 elements.		
0	Student response is incorrect.		
#41 Part B			
Score	Description		
3	 Student response includes each of the following 3 elements: Modeling component: The student provides an expression to represent the total cost of the fence and gate. For example: "43 × (18 + 18 + 27 + 27 - 3) + 128" OR other valid expression. Modeling component: The student explains that the expression in parentheses (18 + 18 + 27 + 27 - 3) is needed to find the perimeter of the lawn minus the gate to find the length of fence needed. Modeling component: The student explains that the length of fence determined has to be multiplied by the cost of the fence and then the cost of the gate has to be added to the result. Note: The term <i>perimeter</i> does not have to be used. 		
2	Student response includes 2 of the 3 elements.		
1	Student response includes 1 of the 3 elements.		
0	Student response is incorrect or irrelevant.		
	#41 Part C		
	Computation component: \$3869		
	Note: A student who correctly evaluates an incorrect expression for finding the total cost of the fence and gate will receive the computation point.		

7

#42			
Score	Description		
3	 Student response includes each of the following 3 elements. Reasoning component = 2 points 		
	• Correct label for point A, $\frac{1}{2}$ hour or equivalent		
	 Correct explanation of how to use the number line to solve the problem Computation component = 1 point 		
	\circ Correct fraction of an hour spent per chore, $\frac{1}{10}$ or		
	equivalent		
	Sample Student Response:		
	Point A should have the label $\frac{1}{2}$ hour.		
	The number line is divided from 0 to $\frac{1}{2}$ in 5 equal sections		
	because there are 5 chores. It would take 10 of these sections to divide the number line from 0 to 1. Each section represents the		
	time she can spend on one chore. So she can spend $\frac{1}{10}$ of an		
	hour on each chore.		
2	Student response includes 2 of the above elements.		
1	Student response includes 1 of the above elements.		
0	The response is incorrect or irrelevant.		



Assessment Reference Sheet

<u>Grade 5</u>

1 mile = 5280 feet 1 mile = 1760 yards 1 pound = 16 ounces 1 ton = 2000 pounds 1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 liter = 1000 cubic centimeters

Right Rectangular Prism	$V = B \times h \text{ or } V = l \times w \times h$
Night Neclangular Frishi	$V = D \wedge \pi \cup V = \iota \wedge W \wedge T$