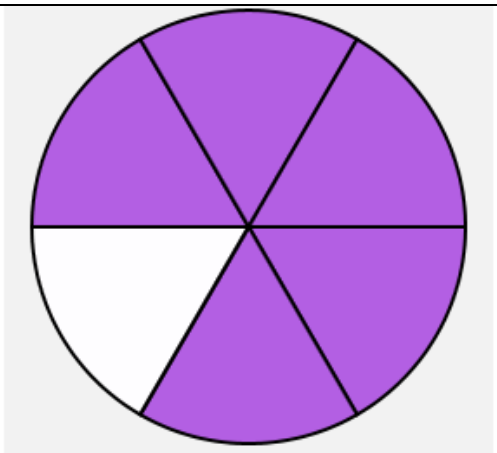
Released Test Answer and Alignment Document

Mathematics – Grade 4

Performance Based Assessment

The following pages include the answer key for all machine-scored items, followed by the rubrics for the hand-scored items.

- The rubrics show sample student responses. Other valid methods for solving the problem can earn full credit unless a specific method is required by the item.
- In items where the scores are awarded for full and partial credit, the definition of partial credit will be confirmed during range-finding (reviewing sets of real student work).
- If students make a computation error, they can still earn points for reasoning or modeling.

Item Number	Answer Key	Evidence Statement Key
1.	123	4.NBT.6-1
2.	3 × 7 = 21	4.OA.1-2
3.	C	4.NF.1-2
4.	 or any 5 of the 6 shaded (or other equivalent fraction)	4.NF.3a
5.	A,B,E	4.NF.2-1
6.	12	4.OA.2
7.	D	4.NBT.2
8.	B, D, F	4.NF.3b-1

9.	Part A: $\frac{2}{12}$ or equivalent fraction Part B: $\frac{3}{12}$ or equivalent fraction	4.NF.3d
10.	Part A: Part B: blue jay < cottontail rabbit; raccoon > snowy owl; thread snake < blue jay	4.NF.A.Int.1
11.	Part A: see rubric Part B: see rubric	4.C.4-5
12.	See rubric	4.C.6-2
13.	See rubric	4.C.7-4
14.	Part A: see rubric Part B: see rubric	4.C.5-6

Part A:

Less than $\frac{5}{10}$ meter	Greater than $\frac{5}{10}$ meter
☑	☐
☑	☐
☐	☑
☐	☑
☑	☐

15.	Part A: see rubric Part B: see rubric	4.D.1
16.	See rubric	4.D.1
17.	Part A: see rubric Part B: see rubric Part C: see rubric	4.D.2

#11 Part A	
Score	**Description**
1	Student response includes the following element. • **Computation component** = 1 point o Machine scored: 0.29 < 0.3
0	Student response is incorrect or irrelevant.

#11 Part B	
Score	**Description**
3	Student response includes the following 3 elements. • **Reasoning component** = 2 points o Valid explanation, using the grids or the decimal inequality created in Part A, of why Jessica is incorrect Note: An explanation on how $\frac{3}{10}$ is equivalent to $\frac{30}{100}$ or 0.3 must be provided. If using $\frac{3}{10}$ equivalent to $\frac{30}{100}$, the explanation must be based off the grids. Simply stating $\frac{3}{10}$ is equivalent to $\frac{30}{100}$ is not sufficient for credit. A response using the decimal comparison model, $\frac{3}{10}$ equivalent to 0.3, is also acceptable. o Valid work or explanation of how to find the correct sum • **Computation component** = 1 point o Correct sum, $\frac{59}{100}$ (or equivalent) Sample Student Response: Jessica tried to add tenths and hundredths. She used the ten columns on the $\frac{3}{10}$ grid and didn't count the squares because then she would have used $\frac{30}{100}$. On the grid, $\frac{3}{10}$ is the same as $\frac{30}{100}$ because 3 rows of 10 on the grid is equal to 0.3 or 0.30, which is $\frac{30}{100}$. When you add the 30 squares covered by $\frac{3}{10}$ to the 29 squares covered by $\frac{29}{100}$, you get 59 squares out of 100, or $\frac{59}{100}$. Notes: • Student may alternatively use the decimal comparison model to explain that $\frac{3}{10}$ is equal to 0.3 or 0.30, which is 30 hundredths. • Student may alternatively use the decimal comparison model to explain that when you add 0.30 and 0.29 you get 0.59, which is $\frac{59}{100}$.
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

#12 Rubric	
Score	**Description**
3	Student response includes the following 3 elements. • **Reasoning component** = 2 points o Valid explanation of errors in work shown o Correct work shown or valid explanation given for finding correct solution • **Computation component** = 1 point o Correct solution, $\frac{18}{4}$ (or equivalent) Sample Student Response: The fractions are incorrectly added. The student should not add together the values in the denominator. The correct way to do this problem is: $1\frac{3}{4} + 2\frac{3}{4} = \frac{4}{4} + \frac{3}{4} + \frac{8}{4} + \frac{3}{4}$ $= \frac{4+3+8+3}{4}$ $= \frac{18}{4}$ Or equivalent appropriate work or explanation.
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.

#13 Rubric	
Score	**Description**
3	Student response includes the following 3 elements. • **Reasoning component** = 2 points o Valid explanation of how to find $\frac{5}{12}$ using the number line o Valid explanation of how to find 2 x $\frac{5}{12}$ using the number line • **Computation component** = 1 point o Correct product, $\frac{10}{12}$ or equivalent Sample Student Response: I know that each tick mark on this number line is equivalent to $\frac{1}{12}$, so to find $\frac{5}{12}$, I would count 5 of the tick marks. Then to find $2 \times \frac{5}{12}$, I would count $\frac{5}{12}$ two times starting at zero on the number line. I would land on $\frac{5}{6}$, which is the same as $\frac{10}{12}$. The product is $\frac{10}{12}$. (or equivalent) Note: Student responses must provide explanations to receive the reasoning component points. Simply identifying the locations of 5/12 and 10/12 is not sufficient for reasoning credit.
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.

#14 Part A	
Score	**Description**
3	Student response includes the following 3 elements. • **Reasoning component** = 3 points o Identifies error of overlapping tiles on corners o Identifies error of not completely covering the rectangle with tiles o Explains a way to correctly cover the rectangle and determines the area of the rectangle is 21 square inches Sample Student Response: One error the student made was she covered each corner of the rectangle twice. Another error she made was she didn't completely cover the entire rectangle. To correctly determine the area, you should cover the entire rectangle with squares without overlapping. If I do this, I would cover the top and bottom edges with 7 tiles each, then I could add another 7 tiles to cover the middle section of the rectangle. In all, I used 21 tiles to cover the entire rectangle with no overlaps. This means that the area of the rectangle is 21 square inches. 7 + 7 + 7 = 21 (or other valid explanation) Notes: • If the error made is shown or stated as the perimeter is being found, not area, a point can be given for either the first or second element, but not a point for each. • Work that correctly shows the area of the rectangle addresses the requirement to explain the way to cover the rectangle.
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.

#14 Part B	
Score	**Description**
1	Student response includes the following element. • **Computation component** = 1 point o Valid multiplication sentence that shows how to find the area of the rectangle shown. Sample Student Response: 7 x 3 = 21
0	Student response is incorrect or irrelevant.

#15 Part A	
Score	**Description**
1	Student response includes the following element. • **Computation component** = 1 point o Machine Scoreable: 77
0	Student response is incorrect or irrelevant.
#15 Part B	
Score	**Description**
2	Student response includes the following 2 elements. • **Modeling component** = 1 point o Valid work or explanation for how to find the total cost of the remaining boxes of clay • **Computation component** = 1 point o Correct cost, $112 Sample Student Response: 77 ÷ 10 = 7, with a remainder of 7 so the teacher needs 8 boxes. 8 x 14 = 112 $112 Or other valid explanation
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#16 Rubric	
Score	**Description**
3	Student response includes the following 3 elements. • **Computation component** = 2 points o Correct amount of paint used for 1 shirt, $\frac{2}{3}$ ounce. o Correct amount of paint used for the poster and 2 shirts, $\frac{10}{3}$ ounces or equivalent. • **Modeling component** = 1 point o Valid work or explanation for both the amount of paint used for 1 shirt and for the amount of paint used for the poster and 2 shirts. Sample Student Response: I found the number of tubes used for each shirt by figuring out what number times 3 is equal to 6. Since $3 \times \boxed{2} = 6$, I now know that for each shirt, 2 tubes are used. To find the number of ounces in 2 tubes, I solved $2 \times \frac{1}{3} = \frac{2}{3}$. To find the number of ounces used for 1 poster, I solved $6 \times \frac{1}{3} = \frac{6}{3}$. For the total number of ounces used for 1 poster and 2 shirts, I added $\frac{2}{3} + \frac{2}{3} + \frac{6}{3} = \frac{10}{3}$. So the total number of ounces used for the poster and 2 shirts is $\frac{10}{3}$. Notes: • Student may earn the computation point for an incorrect amount of paint used for the poster and 2 shirts if it is based on an incorrect amount of paint used for 1 shirt with the correct work shown. • Student may earn the modeling point even if computation is incorrect as long as he or she shows valid work or explanation.
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.

#17 Part A	
Score	**Description**
2	Student response includes the following 2 elements. • **Modeling component** = 1 point o Valid equation that can be used to find the total number of baskets made • **Computation component** = 1 point o Correct total number of baskets made, 54 Sample Student Response: 6 + 18 + 12 + 18 = 54 Notes: • A variety of equations are possible, however, each equation must include an equal sign (or say "equals") to show the relationship between the two quantities. • Students can earn the computation point if they solve an incorrect equation correctly.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#17 Part B	
Score	**Description**
2	Student response includes the following 2 elements. • **Modeling component** = 1 point o Machine Scored: Valid key that can be used to complete the given picture graph, 2, 3, or 6 • **Modeling component** = 1 point o Machine Scored: Correctly completed picture graph based on the chosen key
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

#17 Part C	
Score	**Description**
2	Student response includes the following 2 elements. • **Modeling component** = 2 points o Valid explanation of how student chose a key o Valid explanation of how student used the chosen key to determine the number of basketballs to place in the graph for each player Sample Student Response: All of the numbers in the table are divisible by 3, so I made one basketball equal 3 baskets made. One basketball equals 3 baskets. Tony made 6 baskets and 6 ÷ 3 = 2 so I used 2 basketballs in his row. Michael and Dennis made 18 baskets each and 18 ÷ 3 = 6 so I used 6 baskets in each of their rows. Scott made 12 baskets and 12 ÷ 3 = 4 so I used 4 baskets in his row. Notes: • A variety of explanations are valid as long as the student shows a clear understanding of how to create a key based on the data given. Valid mathematical language should be used to show understanding. • If a computation mistake is made, the modeling points can still be awarded if the explanation is sound. • The response does not have to show mathematical computations or work. An explanation of a reasonable method of how the key was used is sufficient to receive credit.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.