

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.

Unit 1

Item Number	Answer Key	Evidence Statement Key/Content Scope
1.	12	4.MD.3
2.	Part A: $\frac{50}{100}$ (no equivalent accepted) Part B: $\frac{97}{100}$ or equivalent	4.NF.Int.2
3.	21,894	4.NBT.5-1
4.	Part A: 20 Part B: see rubric Part C: see rubric	4.D.2/3.MD.3
5.	<div style="text-align: center; background-color: #f0f0f0; padding: 5px;">Multiples of 8</div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid #add8e6; border-radius: 5px; padding: 5px; width: 40px; text-align: center;">8</div> <div style="border: 1px solid #add8e6; border-radius: 5px; padding: 5px; width: 40px; text-align: center;">24</div> <div style="border: 1px solid #add8e6; border-radius: 5px; padding: 5px; width: 40px; text-align: center;">64</div> <div style="border: 1px solid #add8e6; border-radius: 5px; padding: 5px; width: 40px; text-align: center;">80</div> </div>	4.OA.4-3

6.	$\frac{2}{5} = \frac{40}{100}$ $\frac{3}{5} < \frac{2}{3}$	4.NF.2-1
7.	B, E	4.NBT.2
8.	Part A: 5 Part B: see rubric	4.C.5-5/4.NF.7
9.	4,355	4.NBT.Int.1
10.	Part A: $\frac{3}{10} + \frac{4}{10} = s$ or $\frac{4}{10} + \frac{3}{10} = s$ Part B: $\frac{7}{10}$ or equivalent	4.NF.3d
11.	A, E	4.NF.3a

Unit 2

Item Number	Answer Key	Evidence Statement Key/Content Scope						
1.	58	4.NBT.6-1						
2.	A	4.NBT.1						
3.	See rubric	4.D.1/4.NF.3d and 4.NF.4c						
4.	331	4.NBT.4-2						
5.	$\frac{18}{4}$ or equivalent	4.NF.4c						
6.	Part A: <table border="1" style="margin-left: 20px;"> <tr> <td style="padding: 5px;">Least</td> <td style="padding: 5px; text-align: center;">$\frac{1}{10}$</td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px; text-align: center;">$\frac{2}{5}$</td> </tr> <tr> <td style="padding: 5px;">Greatest</td> <td style="padding: 5px; text-align: center;">$\frac{1}{2}$</td> </tr> </table>	Least	$\frac{1}{10}$		$\frac{2}{5}$	Greatest	$\frac{1}{2}$	4.NF.A.Int.1
Least	$\frac{1}{10}$							
	$\frac{2}{5}$							
Greatest	$\frac{1}{2}$							



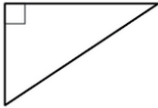




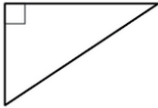




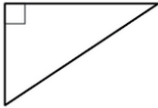


	Part B: $\frac{4}{10}$ (no equivalent accepted)	
7.	C	4.NF.3b-1
8.	A	4.MD.6
9.	Part A: $\frac{13}{10}$ or equivalent Part B: $\frac{92}{10}$ or equivalent	4.Int.6

Unit 3

Item Number	Answer Key	Evidence Statement Key/Content Scope
1.	0.4 meter <input type="text" value=">"/> 0.04 meter 0.3 meter <input type="text" value="<"/> 0.5 meter 0.65 meter <input type="text" value=">"/> 0.61 meter	4.NF.7
2.	D	4.OA.2
3.	See rubric	4.D.1/4.OA.2
4.	Part A: 10 Part B: 15	4.OA.3-2
5.	B, E	4.OA.1-2
6.	Part A: see rubric Part B: see rubric	4.C.4-1/4.NF.1
7.	A, B, D	4.OA.4-1

Unit 4

Item Number	Answer Key	Evidence Statement Key/Content Scope
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1.	15,803	4.NBT.4-1																		
2.	Part A: <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 5px;">y</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 5px;">+</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 5px;">32</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 5px;">+</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 5px;">44</div> = 105 y, 32, and 44 can be in any order. Part B: 29	4.MD.7																		
3.	24	4.OA.3-2																		
4.	Part A: see rubric Part B: see rubric	4.C.5-6																		
5.	C	4.MD.5																		
6.	B	4.NF.4b-1																		
7.	Part A: see rubric Part B: see rubric	4.C.5-1																		
8.	48	4.MD.1																		
9.	1,320	4.Int.4																		
10.	Part A: $\frac{35}{8}$ or equivalent Part B: $\frac{4}{8}$ or equivalent	4.NF.Int.1																		
11.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;"></th> <th style="width: 40%; text-align: center;">Appears to have at least 2 parallel sides</th> <th style="width: 40%; text-align: center;">Has at least 2 perpendicular sides</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>		Appears to have at least 2 parallel sides	Has at least 2 perpendicular sides		<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.G.2
	Appears to have at least 2 parallel sides	Has at least 2 perpendicular sides																		
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12.	2741	4.Int.7																		

Rubrics start on the next page.

Unit 1 #4 Rubric Part A	
Score	Description
1	Computation component: Student enters 20.
0	Student response is incorrect or irrelevant.
Unit 1 #4 Rubric Part B	
Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> • Computation component: 5 students • Modeling component: Student explains how to use the bar graph to determine how many more students have 1 pet than 3 pets. <p>Sample Student Response:</p> <p>I looked at the height of the bar to find the number of students with one pet and saw it was 35. Then I looked at the height of the bar to find the number of students with 3 pets and saw it was 30. I subtracted 30 from 35 and got 5. So, there are 5 more students who have 1 pet than 3 pets.</p> <p>Note: A variety of explanations are valid, as long as it is clear that the student understands how to use the bar graph to answer the question.</p>
1	Student response includes 1 of the 2 elements. If a computation mistake is made, credit cannot be given for the computation component, but 1 point can be given for stating a correct process in the explanation.
0	Student response is incorrect or irrelevant.
Unit 1 #4 Rubric Part C	
Score	Description
3	<p>Student response includes each of the following 3 elements.</p> <ul style="list-style-type: none"> • Computation component: 201 • Modeling component: Student explains how to use the bar graph to solve the problem. • Modeling component: Students shows work using equations. <p>Sample Student Response:</p> <p>I read the height of each bar to know how many students had 1 pet,</p>

	<p>2 pets, 3 pets, or 4 pets. I determined how many pets each bar shows by multiplying the number of students by the number of pets for each bar. Adding the numbers of pets for all the bars gives the total.</p> <p>35 students have 1 pet $1 \times 35 = 35$ pets 20 students have 2 pets $2 \times 20 = 40$ pets 30 students have 3 pets $3 \times 30 = 90$ pets 9 students have 4 pets $4 \times 9 = 36$ pets</p> <p>$35 + 40 + 90 + 36 = 201$ total pets</p> <p>Note: A variety of explanations are valid as long as it is clear that the student understands how to use the bar graph to answer the question and shows work using equations.</p>
2	Student response includes 2 of the 3 elements. If a computation mistake is made, credit cannot be given for the computation component, but points can be given for modeling.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

Unit 1 #8 Rubric Part A

Score	Description
1	Computation component: Student enters 5.
0	Student response is incorrect or irrelevant.

Unit 1 #8 Rubric Part B

Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> • Reasoning component: Student identifies Christy's incorrect reasoning. • Reasoning component: Student gives a valid explanation of how to correct the reasoning and provides a correct comparison. <p>Sample Student Responses:</p> <p>Christy found the correct total distance of her runs, but her comparison is wrong. 0.5 is $\frac{5}{10}$ which equals $\frac{50}{100}$ so she should compare 47 to 50, not 5.</p>

	<p>50 is greater than 47, so $\frac{5}{10} > \frac{47}{100}$.</p> <p>OR</p> <p>Christy's distance $\frac{47}{100} = 0.47$ and Alex ran 0.5 mile, so she should compare 0.5 to 0.47. The 5 in tenths place in 0.5 has a greater value than the 4 in the tenths place in 0.47.</p> <p>Note: Other valid explanations are acceptable.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 2 #3 Rubric

Score	Description
3	<p>Student response includes the following 3 elements.</p> <ul style="list-style-type: none"> • Modeling Component: Gives one fraction pair that sums to $\frac{11}{6}$ • Modeling Component: Gives a different fraction pair that sums to $\frac{11}{6}$ • Modeling Component: States that when adding fractions with the same denominator, the numerators are added and the denominator stays the same <p>Sample Student Response:</p> <p>$\frac{5}{6}$ and $\frac{6}{6}$ or $\frac{7}{6}$ and $\frac{4}{6}$</p> <p>Each pair adds up to $\frac{11}{6}$ because when you add fractions with the same denominator, you add the numerators and the denominator does not change.</p> <p>Or other valid explanation.</p>
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.

Unit 3 #3 Rubric

Score	Description
3	Student response includes each of the following 3 elements.

	<ul style="list-style-type: none"> • Computation component: Rico had 1276 more yards than Ed after the first three games. • Modeling component: Student shows work or explains how to determine the number of yards that Ed had and Rico had after the 3 games. • Modeling component: Student shows work or explains how to determine how many more yards Rico had than Ed. <p>Sample Student Response:</p> <p>I found that Ed had 638 yards by adding $157 + 308 + 172$. Rico had 3 times the number of yards as Ed, so $638 \times 3 = 1914$. To find how many more yards Rico had than Ed, I subtracted 638 from 1914 and got 1276.</p> <p>Note: A variety of explanations are valid as long as the student uses a mathematically correct approach to solving the problem.</p>
2	Student response includes 2 of the 3 elements. If a computation mistake is made, credit cannot be given for the computation component, but points can be given for modeling.
1	Student response includes 1 of the 3 elements.
0	Student response is incorrect or irrelevant.

Unit 3 #6 Rubric Part A

Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> • Computation component: $\frac{4}{12}$ or any equivalent fraction except $\frac{1}{3}$ • Reasoning component: Student explains how to use the model to represent the fraction, such as, "There are 3 rows, so $\frac{1}{3}$ is one row. There are 4 pieces in each row and 12 pieces in all, so $\frac{4}{12}$ would be equal to $\frac{1}{3}$." <p>Note: A variety of explanations are valid, as long as it is clear that the student understands how to use the model to represent the fraction.</p>

1	Student response includes 1 of the 2 elements. If a computation mistake is made, credit cannot be given for the computation component, but 1 point can be given for a correct explanation.
0	Student response is incorrect or irrelevant.
Unit 3 #6 Rubric Part B	
Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> Reasoning component: $\frac{1}{3} < \frac{6}{12}$ or $\frac{6}{12} > \frac{1}{3}$ Reasoning component: Student explains how to use the model to compare the fractions, such as, "$\frac{1}{3}$ was 4 out of 12 pieces, and $\frac{6}{12}$ is 6 out of 12 pieces. 4 pieces is less than 6 pieces, so $\frac{1}{3}$ is less than $\frac{6}{12}$." <p>Note: A variety of explanations are valid, as long as it is clear that the student understands how to use the model to compare the fractions.</p>
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Unit 4 #4 Rubric Part A	
Score	Description
3	<p>Student response includes each of the following 3 elements.</p> <ul style="list-style-type: none"> Reasoning component: Explanation of why Shaun's reasoning is incorrect Reasoning component: Explanation on how to use the number line to determine the fraction that Shaun's point represents Computation component: $\frac{3}{6}$ <p>Sample Student Response:</p> <p>Shaun's reasoning is incorrect because he drew 5 lines between 0 and 1 and said that this divided the line into fifths. This actually divides the line into sixths because there are six equal sections</p>

	between 0 and 1. Shaun's point represents the fraction $\frac{3}{6}$ because each mark on the number line is $\frac{1}{6}$. So, the third mark is the point $\frac{3}{6}$.
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.
Unit 4 #4 Rubric Part B	
Score	Description
1	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> Reasoning component: Describes a process to find a fraction equivalent to $\frac{2}{3}$ <p>Sample Student Response:</p> <p>I can find a fraction equivalent to $\frac{2}{3}$ by multiplying the numerator (2) and denominator (3) by the same number.</p> <p>Note: Other strategies are valid such as showing that another fraction is the same position on a number line.</p>
0	Student response is incorrect or irrelevant.

Unit 4 #7 Rubric Part A	
Score	Description
1	<p>Reasoning component: The student explains the error made. For example: "Jian rounded the quotient up, but that won't work because the remainder of 3 means there are only 3 ounces of honey left, and that isn't enough to fill the last jar."</p> <p>Note: A variety of explanations are possible. As long as the explanation shows a clear understanding of the error made, credit should be awarded.</p>
0	Student response is incorrect or irrelevant.
Unit 4 #7 Rubric Part B	
Score	Description
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> Computation component: 551 (6-ounce) jars and \$4,408

	<ul style="list-style-type: none"> Reasoning component: The student explains the steps needed to solve the problem, including correctly interpreting the remainder. For example: "I would divide 3,311 by 6 and get a quotient of 551, with a remainder of 5. This means they could completely fill 551 jars, but the leftover honey wouldn't be enough to fill another jar. I multiplied $551 \times \\$8$ and got \$4,408. "
1	Student response includes 1 of the 2 elements. If a computation mistake is made, credit cannot be given for the computation component, but points can be given for valid reasoning.
0	Student response is incorrect or irrelevant.