## Answer Key

<table>
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<th>Section 1</th>
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<tbody>
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<td>2. A</td>
<td>32. A</td>
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<tr>
<td>3. B</td>
<td>33. B</td>
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<td>34. A</td>
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<td>52. A</td>
</tr>
<tr>
<td>23. A</td>
<td>53. D</td>
</tr>
<tr>
<td>24. C</td>
<td>54. C</td>
</tr>
<tr>
<td>25. D</td>
<td>55. B</td>
</tr>
<tr>
<td>26. C</td>
<td>56. A</td>
</tr>
<tr>
<td>27. A</td>
<td>57. A</td>
</tr>
<tr>
<td>See Item-Specific Scoring Guidelines and Rubrics.</td>
<td>59. A</td>
</tr>
<tr>
<td>29. See Item-Specific Scoring Guidelines and Rubrics.</td>
<td>60. B</td>
</tr>
<tr>
<td>30. See Item-Specific Scoring Guidelines and Rubrics.</td>
<td>61. B</td>
</tr>
<tr>
<td></td>
<td>62. A</td>
</tr>
<tr>
<td></td>
<td>63. A</td>
</tr>
</tbody>
</table>
**Exemplar Response:**

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

**AND**

\[
\frac{1}{2} = \frac{4}{8}, \frac{1}{4} = \frac{2}{8}
\]

I rewrote some fractions so all the fractions would have the same denominator.

\[
\frac{1}{8} + \frac{2}{8} + \frac{2}{8} + \frac{4}{8} + \frac{4}{8} + \frac{4}{8} = \frac{17}{8} = 2\frac{1}{8}
\]

I added the numerators to find the sum. Then I rewrote the sum as a mixed number.

Aiden walked 2\(\frac{1}{8}\) miles.

| 1              | ![Diagram](image) |

**OR**

\[
\frac{1}{2} = \frac{4}{8}, \frac{1}{4} = \frac{2}{8}
\]

I rewrote some fractions so all the fractions would have the same denominator.

\[
\frac{1}{8} + \frac{2}{8} + \frac{2}{8} + \frac{4}{8} + \frac{4}{8} + \frac{4}{8} = \frac{17}{8} = 2\frac{1}{8}
\]

I added the numerators to find the sum. Then I rewrote the sum as a mixed number.

Aiden walked 2\(\frac{1}{8}\) miles.

| 0              | Response is irrelevant, inappropriate, or not provided. |
Item 30
Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4 | The response achieves the following:  
  - A score of 4 demonstrates that the student completely understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 3 | The response achieves the following:  
  - A score of 3 demonstrates that the student mostly understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 2 | The response achieves the following:  
  - A score of 2 demonstrates that the student somewhat understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 1 | The response achieves the following:  
  - A score of 1 demonstrates that the student has a limited understanding of comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 0 | The response achieves the following:  
  - A score of 0 demonstrates that the student has no understanding of the concept of comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
### Item 30

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4      | The response achieves the following:  
|        | • A score of 4 demonstrates that the student completely understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 3      | The response achieves the following:  
|        | • A score of 3 demonstrates that the student mostly understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 2      | The response achieves the following:  
|        | • A score of 2 demonstrates that the student somewhat understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 1      | The response achieves the following:  
|        | • A score of 1 demonstrates that the student has a limited understanding of comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 0      | The response achieves the following:  
|        | • A score of 0 demonstrates that the student has no understanding of the concept of comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |

**Exemplar Response:**

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Response</th>
</tr>
</thead>
</table>
| 4              | Part A:  
|                | ![Image]  
|                | AND  
| Part B: $\frac{3}{4} < \frac{5}{6}$ OR $\frac{5}{6} > \frac{3}{4}$  
|                | AND  
| Part C: The wholes are the same size, so I could compare the parts of the models that I shaded. I can see that the shaded part for $\frac{5}{6}$ has a greater area than the shaded part for $\frac{3}{4}$.  
|                | AND  
| Part D: Since both fractions are greater than $\frac{1}{2}$ you cannot use this benchmark fraction to compare $\frac{5}{6}$ and $\frac{3}{4}$  
| 3              | Any combination of three correct parts  
| 2              | Any combination of two correct parts  
| 1              | Any one correct part  
| 0              | Response is irrelevant, inappropriate, or incomplete. |
### Item 44

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
  - A score of 2 demonstrates a complete understanding of rewriting a fraction with denominator 10 as a fraction with denominator 100 in order to add it to a fraction with denominator 100. |
| 1      | The response achieves the following:  
  - A score of 2 demonstrates a partial understanding of rewriting a fraction with denominator 10 as a fraction with denominator 100 in order to add it to a fraction with denominator 100. |
| 0      | The response achieves the following:  
  - A score of 0 demonstrates limited to no understanding of rewriting a fraction with denominator 10 as a fraction with denominator 100 in order to add it to a fraction with denominator 100. |

**Exemplar Response:**

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Response</th>
</tr>
</thead>
</table>
| 2              | \[
\begin{align*}
\frac{82}{100} \\
\text{AND} \\
\frac{8}{10} &= \frac{8 \times 10}{10 \times 10} = \frac{80}{100} \\
\text{I rewrote } \frac{8}{10} \text{ as } \frac{80}{100} \text{ by multiplying the numerator and denominator by 10.} \\
\frac{80}{100} + \frac{2}{100} &= \frac{82}{100} \\
\text{Since the fractions have the same denominator, I could add the numerators.} \\
\text{OR other valid explanation}
\end{align*}
\] |
| 1              | \[
\begin{align*}
\frac{82}{100} \\
\text{OR} \\
\frac{8}{10} &= \frac{8 \times 10}{10 \times 10} = \frac{80}{100} \\
\text{I rewrote } \frac{8}{10} \text{ as } \frac{80}{100} \text{ by multiplying the numerator and denominator by 10.} \\
\frac{80}{100} + \frac{2}{100} &= \frac{82}{100} \\
\text{Since the fractions have the same denominator, I could add the numerators.} \\
\text{OR other valid explanation}
\end{align*}
\] |
| 0              | Response is irrelevant, inappropriate, or not provided. |
Answer Keys

Domain 1

Lesson 1
Coached Example
What is the value of the 2? 200,000
What is the value of the 3? 30,000
What is the value of the 9? 9,000
What is the value of the 8? 800
What is the value of the 0? 0
What is the value of the 7? 7
The expanded form of 239,807 is 200,000 + 30,000 + 9,000 + 800 + 7.
There are 239 thousands.
Write the value in words. two hundred thirty-nine thousand
There are 807.
Write the value in words. eight hundred seven
The number name of 239,807 is two hundred thirty-nine thousand, eight hundred seven.

Lesson Practice Part 1
1. D
2. A
3. C
4. C
5. D
6. B
7. B
8. A
9. A. 10,000 + 5,000 + 800 + 30 + 8
   B. 100 times; Explanation may vary. Possible explanation: A digit in one place represents 10 times what it represents in the place to its right. The 8 in the ones place is 2 places to the right of the 8 in the hundreds place. So, the 8 in the hundreds place is 100 times greater.

Lesson Practice Part 2
1. C
2. B
3. A
4. C
5. B
6. D
7. C

Lesson 2
Coached Example
693,041 ≡ 693,582
Are the digits in the hundred thousands place the same? yes
Are the digits in the ten thousands place the same? yes
Are the digits in the thousands place the same? yes
Are the digits in the hundreds place the same? no
0 hundreds is less than 5 hundreds.
So, 693,041 is less than 693,582.
Which symbol should you use? <

Lesson Practice Part 1
1. B
2. B
3. C
4. C
5. D
6. B
7. A
8. A. 2009; Explanation may vary. Possible explanation: I started comparing the greatest place, which is the ten thousands place. All of the numbers have 1 in the ten thousands place. I looked at the thousands place. 12,107 and 12,044 both have 2 in the thousands place. I compared the digits in the hundreds place, and found that 12,107 is greater than 12,044.
B. 2007; Explanation may vary. Possible explanation: From Part A, I looked at the numbers 11,296 and 11,474. Both numbers have 1 in the ten thousands and the thousands places. I compared the digits in the hundreds place. 2 hundreds is less than 4 hundreds, so 11,296 is the least number.

Lesson Practice Part 2
1. A
2. D
3. B
4. C
Domain 1
Lesson 1
Coached Example
What is the value of the 7? 200,000
What is the value of the 8? 30,000
What is the value of the 9? 9,000
What is the value of the 7? 800
What is the value of the 0? 0
What is the value of the 7? 7
The expanded form of 239,807 is 200,000 + 30,000 + 9,000 + 800 + 7.
There are 239 thousands.
Write the value in words. two hundred thirty-nine thousand
There are 807.
Write the value in words. eight hundred seven
The number name of 239,807 is two hundred thirty-nine thousand, eight hundred seven.
Lesson Practice Part 1
1. D
2. A
3. C
4. C
5. D
6. B
7. B

Lesson 2
Coached Example
693,041 < 693,582
Are the digits in the hundred thousands place the same? yes
Are the digits in the ten thousands place the same? yes
Are the digits in the thousands place the same? yes
Are the digits in the hundred place the same? no
0 hundreds is less than 5 hundreds.
So, 693,041 is less than 693,582.
Which symbol should you use? <
600,041 < 600,682
Lesson Practice Part 1
1. B
2. B
3. C
4. C
5. D
6. B
7. A

B. A. 2006: Explanation may vary. Possible explanation: I started comparing the greatest place, which is the ten thousands place. All of the numbers have 1 in the ten thousands place. I looked at the thousands place, 12,107 and 12,044 both have 2 in the thousands place. I compared the digits in the hundreds place, and found that 12,107 is greater than 12,044.
B. 2007: Explanation may vary. Possible explanation: From Part A, I looked at the numbers 11,296 and 11,474. Both numbers have 1 in the ten thousands and the thousands places. I compared the digits in the hundreds place, 2 hundreds is less than 4 hundreds, so 11,296 is the least number.
Lesson Practice Part 2
1. A
2. D
3. B
4. C

Lesson 4
Coached Example
A student ticket costs $34.
A class of 26 students went to the park.
Find 34 × 26 =
Write the problem in vertical form.
34
× 26
204
+ 680
884
Multiply 34 by the ones digit of 26.
8 ones × 34. Regroup.
What is the first partial product? 204
Multiply 34 by the tens digit of 26.
2 tens × 34. Regroup.
What is the second partial product? 680
Add the two partial products.
204 + 680 = 884
The tickets for the students cost $884 in all.
Lesson Practice Part 2
1. A
2. B
3. C
4. C
5. C
6. D
7. A
8. C
9. A. 706 apple pies; I multiplied 57 × 14. First
I multiplied 57 by 4 ones to get 228. Then
I multiplied 57 by 1 ten to get 570. Then I added
the partial products: 228 + 570 = 798.
B. 532 cherry pies; I multiplied 38 × 14. First
I multiplied 38 by 4 ones to get 152. Then I
multiplied 38 by 1 ten to get 380. Then I added
the partial products: 152 + 380 = 532.
Lesson Practice Part 2
1. C
2. D
3. A
4. D
5. C
6. B
7.  A. 2,304; Possible work: $64 \times 36 = 64 \times 6 + 64 \\
\times 30 = 384 + 1,920 = 2,304 \\
\text{B. } $18,432; \text{ Possible work: } 2,304 \times 8 = $18,432 \\

Lesson 5
Coached Example
Use the **commutative** property of multiplication to change the order of the factors.

\[ 5 \times 2 \times 14 = \square \]

Use the **associative** property of multiplication to group the factors.

\[(5 \times 2) \times 14 = \square \]

Multiply inside the parentheses.

\[(10) \times 14 = \square \]

Multiply that factor and the other factor.

\[10 \times 14 = 140 \]

So, \(5 \times 14 \times 2 = 140\)

Joey bought \(140\) jellybeans in all.

Lesson Practice Part 1
1. C
2. C
3. B
4. B
5. A
6. C
7. D
8. D

9. A. Possible answer: \(12 \times 5 \times 6 = \square \)
   
   B. Possible answer: \((12 \times 5) \times 6 = \square \)
   
   C. 360 passengers

Lesson Practice Part 2
1. B
2. A
3. D
4. A
5. C
6. C
7. A
8. B

9. A. Possible answer: \(5 \times 20 \times 13 \)
   
   B. Possible answer: \((5 \times 20) \times 13 \)
   
   C. 1,300; Possible work: \((5 \times 20) \times 13 = 100 \times 13 = 1,300 \)

Lesson 6
Coached Example
There are 32 classrooms.

There are 24 students in each class.

\[32 \times 24 = n\]

Express 24 in expanded form.

\[24 = 20 + 4\]

Rewrite the sentence with 24 in expanded form.

\[32 \times 24 = 32 \times (20 + 4)\]

Distribute 32 to each addend.

\[32 \times (20 + 4) = (32 \times 20) + (32 \times 4)\]

Find each product.

\[(32 \times 20) + (32 \times 4) = n\]

\[640 + 128 = n\]

Add the products.

\[640 + 128 = 768\]

There are 768 students in all at the school.

Lesson Practice Part 1
1. B
2. B
3. A
4. D
5. C
6. C
7. D
8. B

9. A. \(32 \times 64 = \square \)
   
   B. 2,048; Student work may vary. Possible work:
   
   \[32 \times 64 = 32 \times (60 + 4) = (32 \times 60) + (32 \times 4) = 1,920 + 128 = 2,048 \]

Lesson Practice Part 2
1. C
2. A
3. B
4. A
5. C
6. D
7. A
8. D

9. A. 1,288; Possible work: \(46 \times 28 = (40 \times 28) + (6 \times 28) = 1,120 + 168 = 1,288 \)
   
   B. 512; Possible work: \(32 \times 16 = (32 \times 10) + (32 \times 6) = 320 + 192 = 512 \)
7. A: 2,304; Possible work: 64 × 36 = 64 × 6 + 64 × 30 = 604 + 1,920 = 2,504
   B: $16,432; Possible work: 2,304 × 8 = $18,432

Lesson 5
Coached Example

Use the commutative property of multiplication to change the order of the factors.
5 × 2 × 14 =

Use the associative property of multiplication to group the factors.
(5 × 2) × 14 =

Multiply inside the parentheses.
(10) × 14 =

Multiply that factor and the other factor.
10 × 14 = 140
So, 5 × 14 × 2 = 140
Joey bought 140 jellybeans in all.

Lesson Practice Part 1
1. C
2. C
3. B
4. B
5. A
6. C
7. D
B. D

9. A: Possible answer: 12 × 5 × 6 =
   B: Possible answer: (12 × 5) × 6 =
   C: 360 passengers

Lesson Practice Part 2
1. B
2. A
3. A
4. D
5. C
6. C
7. D
B. D

9. A: 32 × 64 =
   B: 2,048; Student work may vary. Possible work:
   32 × 64 = 32 × (60 + 4) = (32 × 60) +
   (32 × 4) = 1,920 + 128 = 2,048

Lesson Practice Part 2
1. C
2. A
3. B
4. A
5. C
6. D
7. A
B. D

9. A: 1,288; Possible work: 46 × 28 = (40 × 28) +
   (6 × 28) = 1,120 + 168 = 1,288
   B: 512; Possible work: 32 × 16 = (32 × 10) +
   (32 × 6) = 320 + 192 = 512

Lesson 6
Coached Example
There are 32 classrooms.
There are 24 students in each class.
32 × 24 =
Express 24 in expanded form.
24 = 20 + 4
Rewrite the sentence with 24 in expanded form.
32 × 24 = 32 × (20 + 4)
Distribute 32 to each addend.
32 × (20 + 4) = (32 × 20) + (32 × 4)
Find each product.
(32 × 20) + (32 × 4) =
640 + 128 =
Add the products.
640 + 128 = 768
There are 768 students in all at the school.

Lesson Practice Part 1
1. A
2. D
3. B
4. C
5. B
6. D
7. C
8. D

9. A: 2; 16 + 8 = 2
   B: 5; 40 + 8 = 5
   C: 7 people; 2 adults + 5 students = 7

Lesson Practice Part 2
1. A
2. B
3. A
4. D
5. B
6. D
7. C
8. B

9. A: 12; Possible work: 36 ÷ 3 = 12
   B: 20; Possible work: 36 - 4 = 32 and
   32 - 12 = 20

Lesson 7
Coached Example
There are 35 desks in 5 equal rows.
35 ÷ 5 =
7 × 5 = 35
Since 7 × 5 = 35, then 36 ÷ 5 = 7.
There are 7 desks in each row.

Lesson Practice Part 1
1. A
2. D
3. B
4. C
5. B
6. D
7. C
8. D

9. A: 2; 16 + 8 = 2
   B: 5; 40 + 8 = 5
   C: 7 people; 2 adults + 5 students = 7

Lesson Practice Part 2
1. A
2. B
3. A
4. D
5. B
6. D
7. C
8. B

9. A: 12; Possible work: 36 ÷ 3 = 12
   B: 20; Possible work: 36 - 4 = 32 and
   32 - 12 = 20

Lesson 8
Coached Example
There are 8,240 seats in all.
There are 8 equal sections.
8,240 ÷ 8 = s

Lesson 9
Coached Example
Nils has 250 inches of ribbon. Each piece she will cut is
9 inches long.
Let p represent the number of 9-inch pieces she
will cut.
Answer Keys (continued)

250 ÷ 9 = p

\[
\begin{array}{c}
27 \text{ R7} \\
9 \longdiv{250} \\
-18 \\
70 \\
-63 \\
7 \\
\end{array}
\]

Check the quotient.

\((9 \times 27) + 7 = p\)

243 ÷ 7 = 250

Does that match the dividend? yes

Is your answer correct? yes

The answer, 27 R7, means Nita can cut 27 9-inch pieces with 7 inches left over.

Nita can cut 27 9-inch pieces.

The length of the ribbon left over is 7 inches.

Lesson Practice Part 1
1. B
2. C
3. C
4. A
5. D
6. C
7. A
8. B
9. A. Let \(p\) represent the number of pizzas.
\[
275 ÷ 8 = p
\]
B. 36 pizzas; I divided 275 by 8 to get 34 with 3 left over. The remainder 3 means that 3 people will need a slice of pizza. So I added 1 to the quotient to get 35 pizzas. 34 + 1 = 35.

\[
\begin{array}{c}
8 | 275 \\
-24 \\
35 \\
-32 \\
3 \\
\end{array}
\]

Lesson Practice Part 2
1. B
2. D
3. B
4. C
5. D
6. C
7. D
8. B
9. A. $600; Explanations may vary. Possible explanation: I multiplied 4 by $200 because that is the cost for the suite. I used mental math by multiplying 4 \times 2 = 8 and added 2 zeros to get $600.
B. 7 nights; Explanations may vary. Possible explanation: I divided $700 by $100 because that is the cost for the standard room. Then I used mental math to divide $700 ÷ $100. The divisor is 100, so I took away 2 zeros from the dividend.

Lesson Practice Part 2
1. A
2. B
3. C
4. C
5. A
6. B
7. D
8. B

Lesson 10
Coached Example
He typed 8,200 words in a report.
He can type 100 words a minute.
Let \(m\) represent the number of minutes it took to type the report.

\[
8,200 ÷ 100 = m
\]
The divisor is 100, so take away 2 zeros from the dividend.

8,200 ÷ 100 = 82

It took Mr. Cassidy 82 minutes to type his report.

Lesson Practice Part 1
1. B
2. B
3. C
4. C
5. D
6. B
7. C
8. C

9. A. $600; Explanations may vary. Possible explanation: I multiplied 4 by $200 because that is the cost for the suite. I used mental math by multiplying 4 \times 2 = 8 and added 2 zeros to get $600.
B. 7 nights; Explanations may vary. Possible explanation: I divided $700 by $100 because that is the cost for the standard room. Then I used mental math to divide $700 ÷ $100. The divisor is 100, so I took away 2 zeros from the dividend.

Lesson Practice Part 2
1. A
2. B
3. C
4. C
5. A
6. B
7. D
8. B
250 ÷ 9 = p
  27 R7
  0250
   -18
   70
   - 63
   7

Check the quotient.
(9 x 27) + 7 = p
243 + 7 = 250
Does that match the dividend? Yes
Is your answer correct? Yes
The answer, 27 R7, means Nita can cut 27 9-inch pieces with 7 inches left over.
Nita can cut 27 9-inch pieces.
The length of the ribbon left over is 7 inches.

Lesson Practice Part 1
1. B
2. C
3. C
4. A
5. D
6. C
7. A
8. B
9. A. Let p represent the number of pizzas. 275 ÷ 8 = p
   B. 35 pizzas; I divided 275 by 8 to get 34 with
   3 left over. The remainder 3 means that
   3 people will need a slice of pizza. I added
   1 to the quotient to get 35 pizzas. 34 + 1 = 35.
   8 R3
   3275
   -24
   35
   - 32
   3

Lesson Practice Part 2
1. B
2. D
3. B
4. C
5. D
6. C
7. D

8. A. 53 R1; 478 ÷ 9 = 53 R1
   B. Possible explanation: I ignored the remainder.
   There was $1 extra and it is not possible to buy
   a fraction of a play ticket.

Lesson 10
Coached Example
He typed 2,200 words in a report.
He can type 100 words a minute.
Let m represent the number of minutes it took to type
the report.
2,200 ÷ 100 = m
The divisor is 100, so take away 2 zeroes from the
dividend.
2,200 ÷ 100 = 22
It took Mr. Cassidy 22 minutes to type his report.

Lesson Practice Part 1
1. B
2. B
3. C
4. C
5. D
6. B
7. C
8. C
9. A. $800; Explanations may vary. Possible
   explanation: I multiplied 4 by $200 because
   that is the cost for the suite. I used mental math
   by multiplying 4 x 2 = 8 and added 2 zeroes
   to get $800.
   B. 7 nights; Explanations may vary. Possible
   explanation: I divided $700 by $100 because
   that is the cost for the standard room. Then
   I used mental math to divide $700 ÷ $100.
   The divisor is 100, so I took away 2 zeroes
   from the dividend.

Lesson Practice Part 2
1. A
2. B
3. C
4. C
5. A
6. B
7. D
8. B

9. A. 28,000
   B. 64; Possible explanation: I divided 64 hundreds
   by 1 hundred to get 64.

Domain 1: Cumulative Assessment
for Lessons 1-10
1. C. MGE4-MT.1, MGE4-MT.2
2. B. MGE4-MT.1
3. D. MGE4-DA.1, MGE4-DA.2, MGE4-DA.3
4. C. MGE4-DA.5, MGE4-DA.3
5. B. MGE4-DA.5
6. C. MGE4-DA.5, MGE4-DA.3
7. D. MGE4-DA.2, MGE4-DA.3
8. A. MGE4-DA.6, MGE4-DA.3
9. 19. MGE4-DA.5, MGE4-DA.3
10. A. Let c represent the quotient. 384 ÷ 4 = c
   B. 384 ÷ 4 = 98 R2. Possible explanation: There
   will be 98 cards in each album. Willie will give
   2 cards to his brother. The quotient shows the
   number of cards in each album. The remainder
   shows the number of cards Willie will give to his
   brother.
   MGE4-DA.5, MGE4-DA.3

Domain 2
Lesson 11
Coached Example
4 x 1 = 4
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
4 x 6 = 24
4 x 7 = 28
The number 25 is between the products 24 and 28.
25 is not a multiple of 4.
Paige cannot get exactly 25 quarters by exchanging
dollar bills.

Lesson Practice Part 1
1. A
2. C
3. D
4. C
5. B
6. B
7. D
8. A

9. 53
10. A. 29 and 47; Explanation may vary. Possible
   explanation: They are prime numbers because
each number has only 1 factor pair, 1 and itself.
B. 14, 32, 55, and 64; Explanation may vary.
   Possible explanation: All of these numbers have
   more than one factor pair. The factor pairs of
   14 are [1, 14], [2, 7]. The factor pairs of 32 are
   [1, 32], [2, 16], [4, 8]. The factor pairs of 55
   are [1, 55], [5, 11]. The factor pairs of 64 are
   [1, 64], [2, 32], [4, 16], [8, 8].

Lesson Practice Part 2
1. A
2. B
3. B
4. D
5. C
6. A
7. C
8. B
9. D
10. B
11. C
12. A
13. A. 42, 44, 45, 46, 48, 49
   B. 48
   C. 1 and 48, 2 and 24, 3 and 16, 4 and 12, 6 and 8

Lesson 12
Coached Example
The club had 12,468 members last year.
The club has 8,271 more members this year.
12,468 + 8,271 = m
12,468 + 8,271 = 20,739

The sum is 20,739.
There are 20,739 members in the club this year.

Lesson Practice Part 1
1. D
2. B
3. C
4. D
5. C
6. A
7. B
8.  A.  More aluminum cans and glass bottles combined; 9,659 + 3,273 = 12,932 and 12,932 > 12,847  

B.  25,779; 12,932 + 12,847 = 25,779

Lesson Practice Part 2
1.  D
2.  C
3.  B
4.  C
5.  A
6.  D
7.  C
8.  A

9.  A.  36,184: Possible work:  

15,759 + 20,425 = 36,184

B.  43,441; Possible work:  

36,184 + 7,257 = 43,441

Lesson 13
Coached Example
Add to find the total amount Lynn spent on the television and the video camera.

Then subtract the sum from the amount Lynn had in her checking account.

Add from right to left:

\[ \begin{array}{c}
$1,150 \\
+ \quad 665 \\
\hline
$1,815 \\
\end{array} \]

Subtract to find how much Lynn has left in her checking account.

\[ \begin{array}{c}
$2,812 \\
- \quad 1,815 \\
\hline
$ 997 \\
\end{array} \]

Use addition to check the subtraction.

\[ \begin{array}{c}
$ 997 \\
+ \quad 1,815 \\
\hline
$2,812 \\
\end{array} \]

Lynn has $997 left in her checking account.

Lesson Practice Part 1
1.  A
2.  D
3.  A
4.  B
5.  A
6.  B
7.  C
8.  D
9.  A.  $4,715; $8,440 - $3,725 = $4,715  

B.  $15,193; Answers may vary. Possible answer:  

First I added the amount for video games and the amount for board games. The total is $3,725 + $8,440 = $12,165. Then I subtracted that amount from the amount of the game consoles. $27,358 - $12,165 = $15,193.

Lesson Practice Part 2
1.  B
2.  B
3.  C
4.  A
5.  A
6.  C
7.  C
8.  B

9.  A.  6,422; Possible work: 10,752 - 4,330 = 6,422  

B.  15,582; Possible work: 30,664 - (10,752 + 4,330) = 30,664 - 15,082 = 15,582

Lesson 14
Coached Example
The place to be rounded to is ten thousands.

The digit in this place is 2.

The digit to the right of the rounding place is 9.

This digit is greater than 5.

Since the digit to the right is greater than 5, round up.

Change all the digits to the right of the rounding place to 0.

129,354 rounds to 130,000.

To the nearest ten thousand, the game Web site received about 130,000 hits that day.

Lesson Practice Part 1
1.  C
2.  B
3.  D
4.  A
5.  B
6.  A
7.  C
8.  C
9. A. Cookies: 300, brownies: 300; muffins: 200
   B. Cookies and brownies; from Part A, I rounded each number to the nearest hundred, and the numbers for both cookies and brownies rounded to 300. The number of muffins rounded to 200.

Lesson Practice Part 2
1. B
2. B
3. C
4. C
5. A
6. B
7. A
8. C
9. A. Yes. Possible explanation: I can round to the nearest thousand to say that 7,000 + 15,000 + 13,000 = 35,000.
   B. Possible answer: 8,000; possible work: 15,000 - 7,000 = 8,000

Lesson 16
Coached Example
Find $7 \times 275 = \square$
Round 275 to the nearest 100.
275 rounds to 300.
Multiply the rounded numbers.
$7 \times 300 = 2,100$
The answer should be about 2,100.
Find the exact answer.
$7 	imes 275 = 1,925$
Is the exact answer close to the estimated answer? Yes
Is the answer reasonable? Yes
The factory shipped 1,925 shirts in all.

Lesson Practice Part 1
1. A
2. C
3. A
4. B
5. A
6. B
7. A
8. C
9. A. $1,675; \$378 + \$226 + \$272 = \$1,575$
   B. Answers may vary. Possible answer: Yes, the answer is reasonable. I rounded each number to the nearest 100, and then added the rounded numbers. $400 + \$900 + \$300 = \$1,600$. Then I compared $1,600$ to $1,575$. They are close, so my answer is reasonable.
Lesson 17
Coached Example
The pattern has 6 terms.
The pattern starts with 55.
The rule is subtract 9.
Subtract 9 from 55.
55 - 9 = 46 ← second term
46 - 9 = 37 ← third term
37 - 9 = 28 ← fourth term
28 - 9 = 19 ← fifth term
19 - 9 = 10 ← sixth term
The six terms in the number pattern are 55, 46, 37, 28, 19, and 10.

Lesson Practice Part 1
1. C
2. B
3. A
4. C
5. C
6. D
7. A
8. B
9. A. 115, 128, 141, 154, 167, 180
   B. 115, 111, 107, 103, 99, 95

Lesson Practice Part 2
1. A
2. C
3. B
4. D
5. C
6. A
7. C
8. C
9. B
10. D
11. A. multiply by 5
      B. 3,750 and 18,750
      C. 4, 20, 100, 500, 2,500

Domain 2: Cumulative Assessment for Lessons 11–17
1. D MGSE4.OA.4
2. B MGSE4.NBT.4, MGSE4.OA.3
3. D MGSE4.OA.4
4. A MGSE4.NBT.3
5. D MGSE4.NBT.3
6. C MGSE4.OA.3
7. D MGSE4.OA.3
8. B MGSE4.OA.3
9. 13, 22, 31, 40, 49 MGSE4.OA.5
10. A. 11,615
   B. 1,716 MGSE4.NBT.4, MGSE4.OA.3

Domain 3
Lesson 18
Coached Example
What is the denominator of \(\frac{3}{6}\)?
What is the denominator of the equivalent fraction? 12
By what number can you multiply 6 to get 12? 2
To find the equivalent fraction, multiply the numerator and denominator by 2.
\[
\frac{3 \times 2}{6 \times 2} = \frac{6}{12}
\]
\(\frac{6}{12}\) is a fraction with 12 as a denominator that is equivalent to \(\frac{\frac{3}{6}}{6}\).

Lesson Practice Part 1
1. B
2. D
3. B
4. D
5. B
6. C
7. A
8. A
9. A. \(\frac{5}{10}\)
   B. Answers may vary. Possible answer: \(\frac{1}{2}\) and \(\frac{10}{20}\)
Lesson Practice Part 2
1. C  
2. C  
3. A  
4. D  
5. C  
6. B  
7. A  
8. C  
9. B  
10. D

11. A, multiply by 5  
   B. 3,750 and 18,750  
   C. 4, 20, 100, 500, 1,500

Domain 2: Cumulative Assessment for Lessons 11–17
1. D MISE4.0A.3  
2. B MISE4.0B.4, MISE4.0A.3  
3. D MISE4.0A.4  
4. A MISE4.0B.3  
5. D MISE4.0B.3  
6. C MISE4.0A.3  
7. D MISE4.0A.3  
8. B MISE4.0A.3  
9. 13, 22, 31, 40, 49 MISE4.0A.5  
10. A, 11, 161  
   B. 1,716 MISE4.0B.4, MISE4.0A.3

Domain 3

Lesson 18
Coached Example
What is the denominator of \( \frac{3}{8} \)?
What is the denominator of the equivalent fraction? 12
By what number can you multiply 6 to get 12? 2
To find the equivalent fraction, multiply the numerator and denominator by 2.
\[ \frac{3 \times 2}{6 \times 2} = \frac{6}{12} \]
\[ \frac{6}{12} \] is a fraction with 12 as a denominator that is equivalent to \( \frac{3}{8} \)

Lesson Practice Part 1
1. B  
2. D  
3. B  
4. D  
5. B  
6. C  
7. A  
8. A  
9. A, \( \frac{5}{8} \)  
B. Answers may vary. Possible answer: 12 and \( \frac{6}{8} \)

Lesson Practice Part 2
1. A  
2. C  
3. B  
4. D  
5. C  
6. A

Lesson 19
Coached Example
Each figure is divided into 8 parts:
The denominator of the improper fraction is 8.
There are 11 shaded parts.
The improper fraction is \( \frac{11}{8} \).
How many figures are completely shaded? 1
The whole number part of the mixed number is 1.
The second figure has 8 parts in all and 3 shaded parts.
The fraction part of the mixed number is \( \frac{3}{8} \).
The mixed number is \( 1 \frac{3}{8} \).
The model represents \( 1 \frac{3}{8} \) or \( 1 \frac{3}{8} \)

Lesson Practice Part 1
1. B  
2. D  
3. B  
4. B  
5. C  
6. D  
7. A, \( \frac{31}{8} \)  
   B. \( \frac{31}{8} \)

Lesson Practice Part 2
1. A  
2. C  
3. B  
4. C  
5. D  
6. B  
7. D  
8. A, \( \frac{10}{8} \)  
   B. \( \frac{2}{8} \)

Lesson 20
Coached Example
Find \( \frac{3}{8} \) on a number line.
Check students’ answers. Number line should be labeled in eights with a point on \( \frac{3}{8} \) closest to the benchmark 1.
Find \( \frac{3}{8} \) on a number line.
Check students’ answers. Number line should be labeled in eights with a point on \( \frac{3}{8} \) closest to the benchmark 0.
Since \( \frac{3}{8} \) is closest to the benchmark 1, and \( \frac{3}{8} \) is greatest than \( \frac{3}{8} \)

Lesson Practice Part 1
1. A  
2. A  
3. D  
4. B  
5. D  
6. B  
7. C  
8. A

9. A, Sugar; answers may vary. Possible answer:
   Since 3 and \( \frac{3}{8} \) have the same numerator, I compared the denominators. The fraction with the smaller denominator is the greater fraction, so \( \frac{3}{8} \) is greater than \( \frac{3}{8} \).
   B. Flour; answers may vary. Possible answer:
   I used a common denominator of 15 for \( \frac{3}{8} \) and \( \frac{3}{8} \)
   \[ \frac{3}{8} = \frac{15}{8} \text{ and } \frac{3}{8} = \frac{15}{8} \] and \( \frac{3}{8} > \frac{3}{8} \) so \( \frac{3}{8} \)

Lesson Practice Part 2
1. A  
2. B  
3. D  
4. D  
5. A  
6. A  
7. C

8. A, Adams; Possible work: \( \frac{8}{4} \times \frac{4}{4} = \frac{8}{20} \times \frac{20}{20} = \frac{8}{20} \)
   B. Adams; Possible work: \( \frac{8}{4} \times \frac{4}{4} = \frac{8}{20} \times \frac{20}{20} = \frac{8}{20} \)
   C. Eli; Possible work: \( \frac{1}{5} \times \frac{5}{5} = \frac{5}{25} > \frac{5}{20} \)
Lesson 21
Coached Example
Sam walked $\frac{1}{12}$ mile to Toni's house.
Then Sam walked $\frac{4}{12}$ mile to school.
$\frac{1}{12} + \frac{4}{12} = m$
Yes, both fractions have a denominator of 12.
Add the numerators.
$1 + 4 = 5$
The denominator stays the same.
$\frac{1}{12} + \frac{4}{12} = \frac{5}{12}$
Sam walked $\frac{5}{12}$ mile in all.

Lesson Practice Part 1
1. C
2. D
3. C
4. B
5. C
6. C
7. A
8. B
9. A. $\frac{7}{10}$ tank; $\frac{4}{10} + \frac{3}{10} = \frac{7}{10}$
   B. $\frac{3}{4}$ of the tank;
   $\frac{1}{8} + \frac{5}{8} = \frac{6}{8} = \frac{3}{4}$

Lesson Practice Part 2
1. A
2. C
3. B
4. D
5. C
6. D
7. B
8. D
9. B
10. A
11. A. $\frac{6}{10}$ or $\frac{3}{5}$
   B. $\frac{5}{10}$ or $\frac{1}{2}$
   C. $\frac{9}{10}$

Lesson 22
Coached Example
The words "how much more" tell you to subtract.
Alexandra wants to jog $\frac{7}{10}$ mile.
She ties her shoelaces after $\frac{3}{10}$ mile.
$\frac{7}{10} - \frac{3}{10} = m$
Yes, both fractions have a denominator of 10.
Subtract the numerators.
$7 - 3 = 4$
The denominator stays the same.
$\frac{7}{10} - \frac{3}{10} = \frac{4}{10}$
Simplify the fraction.
$\frac{4}{10} = \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$
Alexandra has $\frac{2}{5}$ mile more to jog to finish her run.

Lesson Practice Part 1
1. B
2. C
3. B
4. B
5. A
6. B
7. A
8. B
9. A. $\frac{5}{10}$ or $\frac{1}{2}$ pound; $\frac{8}{10} - \frac{3}{10} = \frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$
   B. $\frac{5}{10}$ or $\frac{1}{2}$ pound; $\frac{7}{10} - \frac{2}{10} = \frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$

Lesson Practice Part 2
1. A
2. A
3. C
4. D
5. B
6. C
7. B
8. C
9. A. $\frac{3}{8}$
   B. $\frac{2}{8}$ or $\frac{1}{4}$; Possible work: $1 - \left(\frac{4}{8} + \frac{1}{8} + \frac{1}{8}\right) = \frac{8}{8} - \frac{6}{8} = \frac{2}{8} = \frac{1}{4}$
   C. $\frac{1}{8}$ mile = $\frac{1}{8}$ mile.

30
Lesson 23
Coached Example
The board is $4\frac{1}{4}$ feet long.
He will cut a $2\frac{3}{4}$-foot piece.

$4\frac{1}{4} - 2\frac{3}{4} = b$

$4 = \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{4}{4}$

$4\frac{1}{4} = \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{1}{4} = 17\frac{4}{4}$

So, $4\frac{1}{4} = 17\frac{4}{4}$.

$2 = \frac{4}{4} + \frac{4}{4}$

$2\frac{3}{4} = \frac{4}{4} + \frac{4}{4} + \frac{3}{4} = 11\frac{4}{4}$

So, $2\frac{3}{4} = 11\frac{4}{4}$.

Subtract the improper fractions.

$17\frac{4}{4} - 11\frac{4}{4} = 6\frac{4}{4}$

(Change the improper fraction to mixed number.)

$6 + 4 = 1 R 2$

The mixed number is $1\frac{2}{4}$.

Simplify the fraction part of the mixed number.

$\frac{2}{4} = \frac{1}{2}$

Mr. Lee has $1\frac{1}{2}$ feet of the board left.

Lesson Practice Part 1
1. C
2. C
3. D
4. A
5. C
6. B
7. C
8. B
9. A, $4\frac{2}{4}$ or $4\frac{1}{2}$; $2\frac{1}{4} + 2\frac{1}{4} = 4\frac{2}{4}$

B. 13 pounds; Answers may vary. Possible answer:

$6\frac{1}{4} = 4\frac{2}{4} = \frac{25}{4} - \frac{18}{4} = \frac{7}{4} = 1\frac{3}{4}$ pounds

Lesson Practice Part 2
1. D
2. A
3. C
4. C
5. B
6. D
7. A

B. $\frac{9}{3}$ or $3$ baskets; $9 \times \frac{1}{3} = \frac{9}{3} \times \frac{1}{3} = \frac{9}{3} \times \frac{1}{3} = \frac{9}{3}$ or $3$
Lesson Practice Part 2

1. D
2. C
3. B
4. A
5. A
6. D
7. C
8. D
9. B
10. A. $\frac{15}{4}$ or $3\frac{3}{4}$. Possible work: $5 \times \frac{3}{4} = \frac{15}{4} = 3\frac{3}{4}$
   B. $\frac{9}{4}$ or $2\frac{1}{4}$. Possible work: $3 \times \frac{3}{4} = \frac{9}{4} = 2\frac{1}{4}$

Lesson 25
Coached Example
There are 2 whole grids shaded.
The other grid has 6 out of 100 parts shaded.
So, 0.06 of the other grid is shaded.
Write the decimal in a place-value chart.

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

The whole number part is two.
The decimal point is and.
The decimal part is six.
The least place value is hundredths.
The models show the decimal 2.06.
The word name is two and six hundredths.

Lesson Practice Part 1

1. D
2. C
3. B
4. B
5. B
6. A
7. B
8. C
9. A. 3.65
   B. 3 ones, 6 tenths, 5 hundredths or 3 ones, 65 hundredths
   C. three and sixty-five hundredths
Lesson Practice Part 1
1. B
2. C
3. C
4. B
5. D
6. A
7. A
8. B
9. A. $0.25$, and $\frac{25}{100} = \frac{1}{4}$
   B. $0.25 = \frac{2}{10} + \frac{5}{100}$

Lesson Practice Part 2
1. C
2. A
3. D
4. C
5. B
6. D
7. A
8. B
9. A. $\frac{3}{100} + \frac{20}{100}$
   B. $\frac{20}{100}$
   C. 0.23

Lesson 27
Coached Example

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

Compare the digits in the greatest place, the ones.
0 ones = 0 ones = 0 ones

All of the digits in the greatest place are equal.

Compare the digits in the next greatest place, the tenths.
5 tenths > 4 tenths, so 0.52 is the greatest decimal.

Compare the digits in the next greatest place, the hundredths.
0 hundredths < 8 hundredths, so 0.40 is the least decimal.

From least to greatest, the order of the decimals is 0.40, 0.48, 0.52.

Lesson Practice Part 2
1. A
2. D
3. D
4. A
5. C
6. A
7. C
8. D
9. A. $\frac{3}{100} + \frac{20}{100}$
   B. $\frac{20}{100}$
   C. 0.23

B. roast beef

Lesson Practice Part 2
1. A
2. D
3. B
4. D
5. B
6. C
7. C
8. D
9. A. 2011
   B. 2012

Domain 3: Cumulative Assessment for Lessons 18–27
1. C MGSE4.NF.1
2. C MGSE4.NF.3a, MGSE4.NF.3b, MGSE4.NF.3d
3. B MGSE4.NF.3a, MGSE4.NF.3d
4. D MGSE4.NF.4a, MGSE4.NF.4b, MGSE4.NF.4c
5. D MGSE4.NF.2
6. B MGSE4.NF.6
7. C MGSE4.NF.5, MGSE4.NF.6
8. D MGSE4.NF.7
9. $\frac{5}{6}$ or $5\frac{1}{3}$ MGSE4.NF.3b, MGSE4.NF.3c
10. A. $2\frac{2}{3}$ pints; $3\frac{1}{4} - \frac{3}{4} = \frac{13}{4} - \frac{3}{4} = \frac{10}{4} = 2\frac{1}{2}$
    B. $2\frac{1}{2}$ MGSE4.NF.3a, MGSE4.NF.3b, MGSE4.NF.3c, MGSE4.NF.3d
Domain 4
Lesson 28
Coached Example
Find the total amount Marvin spent.
Then subtract that amount from $20.00.
Marvin bought 2 books that cost $6.00 each.
So, 2 books cost $12.00.
Add the cost of 2 books to the cost of the bookmark.
$12.00 + $1.50 = $13.50
Marvin spent $13.50 in all.
Subtract the total amount from the amount Marvin has.
$20.00 - $13.50 = $6.50
Show your work.

\[
\begin{array}{c}
9 \\
110.40 \\
2,000.00 \\
-13.50 \\
\hline
6.50 \\
\end{array}
\]

Marvin has $6.50 left.
Lesson Practice Part 1
1. C
2. A
3. D
4. B
5. A
6. D
7. A
8. A. $4.70; Answers may vary. Possible answer:
$2.50 + $1.20 + $0.50 + $0.50 = $4.70
B. $0.30; $5.00 - $4.70 = $0.30

Lesson Practice Part 2
1. D
2. A
3. B
4. B
5. A
6. C
7. C
8. A. $8.50; Possible work: 2 \times (2.75 + 0.75) + 1.50
= 2 \times 3.5 + 1.5 = 7 + 1.5 = 8.5 = $8.50
B. No, you would be $0.25 short. The cost of the
two slices is $5.50, so $5.50 + $1.50 + $3.25
= $10.25, which is $0.25 more than $10.
Lesson 29
Coached Example
1 minute = 60 seconds
Which is the larger unit? minutes
Which is the smaller unit? seconds
When you change from a larger unit to a smaller unit,
which operation do you use? multiplication
Show your work.

5 \times 60 = 300
There are 300 seconds in 5 minutes.
The music video is 300 seconds long.
Lesson Practice Part 1
1. A
2. C
3. B
4. C
5. A
6. D
7. B
8. C
9. A. \(2\frac{2}{3}\)

\[0 \quad 1 \quad 2 \quad 3 \quad 4 \quad \]

Hours
B. 160; Possible work: \(\frac{1}{3} \times 60 = 20, 20 \times 8 = 160\)
Lesson Practice Part 2
1. A
2. C
3. D
4. B
5. C
6. C
7. B
8. D
9. A. 1 hour 35 minutes
B. 4 hours 50 minutes; Possible explanation:
I broke up the times of the first leg: 9:35 to
10:00 is 25 minutes, 10:00 to 12:10 is 2 hours
10 minutes. The first leg had an elapsed time
of 2 hours 35 minutes. I did the same for the
second leg: 1:45 to 2:00 is 15 minutes, 2:00 to
4:00 is 2 hours, so the second leg is 2 hours
15 minutes. I added the elapsed times to get
4 hours 50 minutes.
Lesson 30
Coached Example
Which is the smaller unit, pounds or ounces? **ounces**
1 pound = **16** ounces
Multiply to change 3 pounds to ounces.
3 \( \times 16 = 48 \) ounces
Peanuts: 3 pounds or **48** ounces
48 ounces > 45 ounces
Deanna has more **peanuts** than **raisins**.
Lesson Practice Part 1
1. D
2. B
3. C
4. D
5. B
6. A
7. C
8. B
9. A. 26 pounds; Answers may vary. Possible answer:
   \[ 8 \frac{1}{2} + 8 \frac{1}{2} = 17 \text{ pounds}. \]
   \[ 4 \frac{1}{2} + 4 \frac{1}{2} = 9 \text{ pounds}. \frac{17 + 9 = 26 \text{ pounds}}{144 \text{ ounces}; 9 \text{ pounds} \times 16 \text{ ounces} = 144 \text{ ounces}} \]
Lesson Practice Part 2
1. D
2. C
3. A
4. D
5. C
6. A
7. A
8. C
9. B
10. A. The team with 6 students will have the larger students. Possible explanation: There are fewer people to divide among the 600 pounds.
   B. 25 pounds; Possible work: 600 \div 8 = 75, \[600 \div 10 = 100, 100 - 75 = 25\]
Lesson 31
Coached Example
The bottle has a capacity of 2 liters.
The bucket has a capacity that is 4 times more than the bottle.
Which operation should you use to find the capacity of the bucket? **multiplication**
Find 2 \( \times 4 = b \)
Multiply.
2 \( \times 4 = 8 \) liters
Change the capacity of the bucket in liters to milliliters.
1 liter = **1,000** milliliters
Multiply to change from liters to milliliters.
8 \( \times 1,000 = 8,000 \) milliliters
The capacity of the bucket is **8,000** milliliters.
Lesson Practice Part 1
1. D
2. A
3. B
4. B
5. D
6. A
7. C
8. D
9. A. 3,000 milliliters; 3 \( \times 1,000 = 3,000 \) milliliters
   B. 2 liters; 850 + 900 + 250 = 2,000 mL; Since 1,000 mL = 1 L, then 2,000 mL = 2 L
Lesson Practice Part 2
1. C
2. B
3. A
4. D
5. B
6. C
7. A
8. D
9. B
10. A. 6
    B. 12
    C. Travis drinks less than 7 gallons per week.
    Possible explanation: Travis would need to drink 1 gallon per day to drink 7 gallons per week. Because 1 gallon = 4 quarts, and Travis is drinking 3 quarts per day, he is drinking less than a gallon of water per day.
Lesson 32
She lives 3 kilometers from the mall.
To change from kilometers to meters, should you use multiplication or division? multiplication
1 kilometer = 1,000 meters
3 \times 1,000 \text{ meters} = 3,000 \text{ meters}
So 3 kilometers = 3,000 meters.
She lives 1.6 kilometers from the school.
Find 1.6 on the number line. Draw a point.

Kilometers

Nicole lives 3,000 meters from the mall. The point on the number line above shows the distance, in kilometers, Nicole lives from school.

Lesson Practice Part 1
1. C
2. B
3. A
4. D
5. C
6. A
7. D
8. B
9. A. 42 inches; I first changed 2 \frac{1}{2} feet to inches.
I found 2 feet by multiplying 2 \times 12 = 24 inches. Since 1 foot = 12 inches, I know that \frac{1}{2} foot = 6 inches. 24 + 6 = 30 inches. So 2 \frac{1}{2} feet = 30 inches. Then I added 30 + 12 = 42 inches to find the total length.

B. \begin{array}{cccccc}
0 & 1 & 2 & 3 & 4 & 5
\end{array}

Feet

I know that 12 inches = 1 foot, so I added 1 + 2 \frac{1}{2} feet = 3 \frac{1}{2} feet.

Lesson Practice Part 2
1. B
2. B
3. D
4. A
5. D
6. C
7. C
8. B
9. A. 400 cm; P = 4 \times s = 4 \times 100 = 400 \text{ cm}
B. 10 km; P = (2 \times l) + (2 \times w)
46 = (2 \times 13) + (2 \times w)
46 = 26 + 2 \times w
46 - 26 = 26 - 26 + 2 \times w
20 = 2 \times w
20 + 2 = 2 + 2 \times w
10 = w
Lesson Practice Part 2
1. D
2. B
3. A
4. D
5. C
6. B
7. A
8. B
9. A
10. A. 7
    B. 8 yards by 6 yards, 9 yards by 5 yards, 10 yards by 4 yards

Lesson 34
Coached Example
To find the area of the rectangle, multiply the length by the width.
Write the area formula. Use \( l \) for length and \( w \) for width.
\[ A = l \times w \]
Substitute the values into the formula.
\[ A = 80 \times 45 \]
Multiply.
\[ A = 3,600 \]
The units are square feet.
The playground has an area of 3,600 square feet.

Lesson Practice Part 1
1. A
2. D
3. C
4. B
5. A
6. C
7. A
8. C
9. A. 700 = 20 \times w
    B. 35 feet; 700 = 20 \times w
        \[ 700 \div 20 = 20 \div 20 \times w \]
        \[ 35 = w \]

Lesson Practice Part 2
1. C
2. A
3. A
4. B
5. B
6. D
7. A
8. A. 150°
    B. \[ \frac{150}{360} \]
    C. \[ \text{?} \]

Lesson 35
Coached Example
Put the center mark of the protractor on the vertex of the angle.
Line up one ray of the angle with the 0° mark on one of the scales.
The ray crosses the scale at \( 80° \).
It crosses the other scale at \( 100° \).
Check your answer.
Angle \( T \) appears less than 90°, so the measure is \( 80° \)
not \( 100° \).
The measure of \( \angle T \) is \( 80° \).

Lesson Practice Part 1
1. D
2. A
3. C
4. B
5. B
6. D
7. A
8. A. 70°
    B. Check students' drawings. Students should draw an angle with a measure of 115°.

Lesson Practice Part 2
1. C
2. A
3. A
4. B
5. B
6. D
7. A
8. A. 150°
    B. \[ \frac{150}{360} \]
    C. \[ \text{?} \]
Lesson 36
Coached Example
Count the number of Xs above the time of $\frac{1}{4}$ hour on the number line.
There are 2 Xs above that time.
So, 2 students spent $\frac{1}{4}$ hour reading last night.
To find how much time in all those students spent reading, which operation should you use? **addition**
$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
So, 2 students spent $\frac{1}{4}$ hour reading last night.
In all, those students spent $\frac{2}{4}$ or $\frac{1}{2}$ hour reading.
Lesson Practice Part 1
1. C
2. B
3. C
4. B
5. A
6. D
7. C
8. B
9. A. **Time Spent Watching TV Special**
   \[
   \begin{array}{cccc}
   X & X & X & X \\
   X & X & X & X \\
   \end{array}
   \]
   **Hours**
   0 $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ 1

   B. 6
Lesson Practice Part 2
1. A
2. C
3. D
4. A. Possible line plot:

**Science Fair**

B. $\frac{3}{4}$ foot

Domain 4: Cumulative Assessment for Lessons 28–36
1. C MGSE4.MD.2
2. D MGSE4.MD.1, MGSE4.MD.2
3. A MGSE4.MD.3
4. B MGSE4.MD.1, MGSE4.MD.2
5. C MGSE4.MD.1
6. C MGSE4.MD.3
7. B MGSE4.MD.1, MGSE4.MD.2
8. A MGSE4.MD.7
9. 115° MGSE4.MD.6
10. A. **Candle Heights**
   \[
   \begin{array}{cccc}
   X & X & X & X \\
   X & X & X & X \\
   \end{array}
   \]
   **Feet**
   0 $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ 1

   B. $\frac{3}{4}$ foot

Domain 5
Lesson 37
Coached Example
Does $\angle A$ appear to be exactly 90°? **no**
Is $\angle A$ a right angle? **no**
Does $\angle A$ appear to be less than 90°? **no**
Is $\angle A$ an acute angle? **no**
Does $\angle A$ appear to be greater than 90°? **yes**
Is $\angle A$ an obtuse angle? **yes**
Angle A is an **obtuse** angle.
Lesson Practice Part 1
1. A
2. B
3. A
4. C
5. C
6. D
7. B
8. A. Answers may vary. Possible answers: 3:00 or 9:00.
   B. Check students' drawings. Answers will vary.
      Possible answer: acute angle = 3:20; obtuse angle = 2:40.

Lesson Practice Part 2
1. A
2. D
3. B
4. A
5. C
6. D
7. D
8. C
9. A. Possible angle:

   ![Diagram]

B. T

C.

Lesson 38
Coached Example
Does the shape have straight sides? yes
Is the shape a polygon? yes
How many straight sides does the shape have? 4
How many angles does the shape have? 4
Is the shape a quadrilateral? yes

Does the shape have any right angles? no
Is the shape a rectangle? no
What types of angles does the shape have? 2 acute angles and 2 obtuse angles
Does the shape have parallel sides? yes
How many pairs of parallel sides does the shape have? 1
Which quadrilateral has only 1 pair of parallel sides?
   trapezoid
   The name of this two-dimensional shape is trapezoid.

Lesson Practice Part 1
1. B
2. A
3. C
4. B
5. B
6. C
7. D
8. B
9. A. The shape has 1 right angle, 2 acute angles, and 1 obtuse angle.
   B. Answers may vary. Possible answer: The shape has 1 pair of perpendicular sides. Angle B shows that the two sides intersect at a right angle. The shape does not have any parallel sides. None of the sides are the same distance apart.
   C. quadrilateral

Lesson Practice Part 2
1. D
2. A
3. B
4. C
5. C
6. A
7. D
8. A
9. B
10. A. Quadrilateral A is a rhombus. Quadrilateral B is a rectangle.
    B. Possible answer: Both are parallelograms because they have 2 pairs of opposite sides parallel.
    C. Possible answer: The rhombus has 4 equal sides, but does not have any right angles. The rectangle has 4 right angles, but not all sides are equal.
Lesson 39
Coached Example
Look at the letter E.
It has 1 line of symmetry.
Does the letter E have line symmetry? **yes**
Look at the letter S.
It has 0 lines of symmetry.
Does the letter S have line symmetry? **no**
Look at the letter H.
It has 2 lines of symmetry.
Does the letter H have line symmetry? **yes**
The letters **E** and **H** have line symmetry.

Lesson Practice Part 1
1. D
2. A
3. B
4. B
5. C
6. C
7. B
8. A. Check students' drawings for a horizontal line of symmetry.

B. Yes, the figure has line symmetry. The line of symmetry divides the figure into two matching parts. So the figure has line symmetry.

Lesson Practice Part 2
1. D
2. B
3. A
4. D
5. C
6. A
7. B
8. A
9. A, 2
B.

---

Domain 5: Cumulative Assessment for Lessons 37–39
1. A MGSE4.G.1
2. C MGSE4.G.1
3. A MGSE4.G.1
4. D MGSE4.G.1
5. A MGSE4.G.2
6. B MGSE4.G.1
8. D MGSE4.G.3
9. 1 MGSE4.G.3
10. A. 2

B. Check students' drawings. Drawings should show both a horizontal and a vertical line of symmetry. MGSE4.G.3
## Answer Key

### Section 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>D</td>
</tr>
<tr>
<td>2.</td>
<td>A</td>
</tr>
<tr>
<td>3.</td>
<td>C</td>
</tr>
<tr>
<td>4.</td>
<td>B</td>
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<tr>
<td>5.</td>
<td>A</td>
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<td>6.</td>
<td>B</td>
</tr>
<tr>
<td>7.</td>
<td>B</td>
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<td>8.</td>
<td>A</td>
</tr>
<tr>
<td>9.</td>
<td>D</td>
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<td>10.</td>
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<td>11.</td>
<td>B</td>
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<tr>
<td>12.</td>
<td>D</td>
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<td>13.</td>
<td>B</td>
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<td>14.</td>
<td>C</td>
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<td>15.</td>
<td>B</td>
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<td>16.</td>
<td>A</td>
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<td>17.</td>
<td>D</td>
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<td>18.</td>
<td>A</td>
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<tr>
<td>19.</td>
<td>D</td>
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<tr>
<td>20.</td>
<td>B</td>
</tr>
<tr>
<td>21.</td>
<td>B</td>
</tr>
<tr>
<td>22.</td>
<td>D</td>
</tr>
<tr>
<td>23.</td>
<td>B</td>
</tr>
<tr>
<td>24.</td>
<td>C</td>
</tr>
<tr>
<td>25.</td>
<td>C</td>
</tr>
<tr>
<td>26.</td>
<td>D</td>
</tr>
<tr>
<td>27.</td>
<td>A</td>
</tr>
</tbody>
</table>

### Section 2

<p>| | |</p>
<table>
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<th></th>
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<tbody>
<tr>
<td>31.</td>
<td>B</td>
</tr>
<tr>
<td>32.</td>
<td>D</td>
</tr>
<tr>
<td>33.</td>
<td>B</td>
</tr>
<tr>
<td>34.</td>
<td>C</td>
</tr>
<tr>
<td>35.</td>
<td>A</td>
</tr>
<tr>
<td>36.</td>
<td>D</td>
</tr>
<tr>
<td>37.</td>
<td>C</td>
</tr>
<tr>
<td>38.</td>
<td>D</td>
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<td>39.</td>
<td>A</td>
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<td>41.</td>
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<td>42.</td>
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<td>43.</td>
<td>D</td>
</tr>
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<td>44.</td>
<td>D</td>
</tr>
<tr>
<td>45.</td>
<td>D</td>
</tr>
<tr>
<td>46.</td>
<td>A</td>
</tr>
<tr>
<td>47.</td>
<td>A</td>
</tr>
<tr>
<td>48.</td>
<td>B</td>
</tr>
<tr>
<td>49.</td>
<td>C</td>
</tr>
<tr>
<td>50.</td>
<td>C</td>
</tr>
<tr>
<td>51.</td>
<td>C</td>
</tr>
<tr>
<td>52.</td>
<td>A</td>
</tr>
<tr>
<td>53.</td>
<td>D</td>
</tr>
<tr>
<td>54.</td>
<td>B</td>
</tr>
<tr>
<td>55.</td>
<td>D</td>
</tr>
<tr>
<td>56.</td>
<td>A</td>
</tr>
<tr>
<td>57.</td>
<td>B</td>
</tr>
<tr>
<td>58.</td>
<td>C</td>
</tr>
<tr>
<td>59.</td>
<td>B</td>
</tr>
</tbody>
</table>

60. See Item-Specific Scoring Guidelines and Rubrics.

61. A

62. D

63. B
**Item-Specific Scoring Guidelines and Rubrics**

**Item 28**

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
**•** A score of 2 demonstrates a complete understanding of generating a number pattern using a rule, and identifying a non-explicit feature of that pattern.  
**•** Student determines that the correct answer for Part A is choice B  
AND  
**•** Student determines that the correct answer for Part B is choice A. |
| 1      | The response achieves the following:  
**•** A score of 1 demonstrates a partial understanding of generating a number pattern using a rule, and identifying a non-explicit feature of that pattern.  
**•** Student determines that the correct answer for Part A is choice B  
OR  
**•** Student determines that the correct answer for Part B is choice A. |
| 0      | The response achieves the following:  
**•** A score of 0 demonstrates limited to no understanding of generating a number pattern using a rule. |

**Item 29**

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
**•** A score of 2 demonstrates a complete understanding of generating a line plot from data and using the data to solve a problem. |
| 1      | The response achieves the following:  
**•** A score of 1 demonstrates a partial understanding of generating a line plot from data and using the data to solve a problem.  
**•** Give 1 point if the student's line plot is correct OR if the student's calculation is correct. |
| 0      | The response achieves the following:  
**•** A score of 0 demonstrates limited to no understanding of generating a line plot from data and using the data to solve a problem. |
**Exemplar Response:**

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Fish Fiona Caught</td>
</tr>
<tr>
<td></td>
<td>[ \frac{1}{2} = \frac{4}{8}, \frac{1}{4} = \frac{2}{8}, 1 = \frac{8}{8} ]</td>
</tr>
<tr>
<td></td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>[ \frac{1}{8} + \frac{1}{8} + \frac{2}{8} + \frac{4}{8} + \frac{4}{8} + \frac{4}{8} + \frac{8}{8} = \frac{24}{8} = 3 ]</td>
</tr>
<tr>
<td></td>
<td>I rewrote some fractions and the whole number so they would all be fractions with the same denominator.</td>
</tr>
<tr>
<td></td>
<td>I added the numerators to find the sum. Then I rewrote the sum as a whole number.</td>
</tr>
<tr>
<td></td>
<td>Fiona caught 3 pounds of fish.</td>
</tr>
<tr>
<td>1</td>
<td>Fish Fiona Caught</td>
</tr>
<tr>
<td></td>
<td>[ \frac{1}{2} = \frac{4}{8}, \frac{1}{4} = \frac{2}{8}, 1 = \frac{8}{8} ]</td>
</tr>
<tr>
<td></td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>[ \frac{1}{8} + \frac{1}{8} + \frac{2}{8} + \frac{4}{8} + \frac{4}{8} + \frac{4}{8} + \frac{8}{8} = \frac{24}{8} = 3 ]</td>
</tr>
<tr>
<td></td>
<td>I rewrote some fractions and the whole number so they would all be fractions with the same denominator.</td>
</tr>
<tr>
<td></td>
<td>I added the numerators to find the sum. Then I rewrote the sum as a whole number.</td>
</tr>
<tr>
<td></td>
<td>Fiona caught 3 pounds of fish.</td>
</tr>
<tr>
<td>0</td>
<td>Response is irrelevant, inappropriate, or not provided.</td>
</tr>
</tbody>
</table>
**Item 30**  
**Scoring Rubric**

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4      | The response achieves the following:  
- A score of 4 demonstrates that the student completely understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 3      | The response achieves the following:  
- A score of 3 demonstrates that the student mostly understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 2      | The response achieves the following:  
- A score of 2 demonstrates that the student somewhat understands comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 1      | The response achieves the following:  
- A score of 1 demonstrates that the student has a limited understanding of comparing fractions by reasoning about size, recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
| 0      | The response achieves the following:  
- A score of 0 demonstrates that the student has no understanding of the concept of comparing fractions by reasoning about size; recording comparisons using $>$, $<$, or $=$; and comparing fractions by comparing them to a benchmark fraction. |
### Exemplar Response:

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><img src="image" alt="Part A: Grids" /> AND <img src="image" alt="Part A: Grids" /></td>
</tr>
<tr>
<td>3</td>
<td>Any combination of three correct parts</td>
</tr>
<tr>
<td>2</td>
<td>Any combination of two correct parts</td>
</tr>
<tr>
<td>1</td>
<td>Any one correct part</td>
</tr>
<tr>
<td>0</td>
<td>Response is irrelevant, inappropriate, or incomplete.</td>
</tr>
</tbody>
</table>
Item 60
Scoring Rubric

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2      | The response achieves the following:  
         - A score of 2 demonstrates a complete understanding of rewriting a fraction with denominator 10 as a fraction with denominator 100 in order to add it to a fraction with denominator 100. |
| 1      | The response achieves the following:  
         - A score of 1 demonstrates a partial understanding of rewriting a fraction with denominator 10 as a fraction with denominator 100 in order to add it to a fraction with denominator 100. |
| 0      | The response achieves the following:  
         - A score of 0 demonstrates limited to no understanding of rewriting a fraction with denominator 10 as a fraction with denominator 100 in order to add it to a fraction with denominator 100. |

Exemplar Response:

<table>
<thead>
<tr>
<th>Points Awarded</th>
<th>Response</th>
</tr>
</thead>
</table>
| 2              | \[
\begin{align*}
\frac{53}{100} \\
\text{AND} \\
\frac{5}{10} &= \frac{5 \times 10}{10 \times 10} = \frac{50}{100} \\
\text{I rewrote } \frac{5}{10} \text{ as } \frac{50}{100} \text{ by multiplying the numerator and denominator by } 10. \\
\frac{3}{100} + \frac{50}{100} &= \frac{53}{100} \\
\text{Since the fractions have the same denominator, I could add the numerators.} \\
\text{OR other valid explanation}
\end{align*}
\] |
| 1              | \[
\begin{align*}
\frac{53}{100} \\
\text{OR} \\
\frac{5}{10} &= \frac{5 \times 10}{10 \times 10} = \frac{50}{100} \\
\text{I rewrote } \frac{5}{10} \text{ as } \frac{50}{100} \text{ by multiplying the numerator and denominator by } 10. \\
\frac{3}{100} + \frac{50}{100} &= \frac{53}{100} \\
\text{Since the fractions have the same denominator, I could add the numerators.} \\
\text{OR other valid explanation}
\end{align*}
\] |
| 0              | Response is irrelevant, inappropriate, or not provided. |