GRADE 4 • MODULE 3
Multi-Digit Multiplication and Division

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Lesson 1 Problem Set

Name ________________________________ Date ________________

1. Determine the perimeter and area of rectangles A and B.

A = _______________ P = _______________

A = _______________ P = _______________

2. Determine the perimeter and area of each rectangle.
   a.  
      6 cm
      5 cm
      P = ____________
      A = ____________

   b.  
      3 cm
      8 cm
      P = ____________
      A = ____________

3. Determine the perimeter of each rectangle.
   a.  
      166 m
      99 m
      P = ____________

   b.  
      1 m 50 cm
      75 cm
      P = ____________
4. Given the rectangle’s area, find the unknown side length.
   a. \[8 \text{ cm}\]
      \[
      \begin{array}{c}
      \text{80 square cm} \\
      x \text{ cm}
      \end{array}
      \]
      
      \[x = \text{__________} \]
   
   b. \[7 \text{ cm}\]
      \[
      \begin{array}{c}
      \text{49 square cm} \\
      x \text{ cm}
      \end{array}
      \]
      
      \[x = \text{__________} \]

5. Given the rectangle’s perimeter, find the unknown side length.
   a. \[P = 120 \text{ cm}\]
      \[
      \begin{array}{c}
      \text{20 cm} \\
      x \text{ cm}
      \end{array}
      \]
      
      \[x = \text{__________} \]
   
   b. \[P = 1,000 \text{ m}\]
      \[
      \begin{array}{c}
      \text{250 m} \\
      x \text{ m}
      \end{array}
      \]
      
      \[x = \text{__________} \]

6. Each of the following rectangles has whole number side lengths. Given the area and perimeter, find the length and width.
   a. \[P = 20 \text{ cm}\]
      \[
      \begin{array}{c}
      \text{24 square cm} \\
      \end{array}
      \]
      
      \[l = \text{__________} \]
      \[w = \text{__________} \]
   
   b. \[P = 28 \text{ m}\]
      \[
      \begin{array}{c}
      \text{24 square cm} \\
      \end{array}
      \]
      
      \[w = \text{__________} \]
      \[l = \text{__________} \]
Lesson 1 Exit Ticket

Name _______________________________ Date __________________

1. Determine the area and perimeter of the rectangle.

   \[ \text{Area} = 8 \times 2 = 16 \text{ cm}^2 \]
   \[ \text{Perimeter} = 2(8 + 2) = 20 \text{ cm} \]

2. Determine the perimeter of the rectangle.

   \[ \text{Perimeter} = 2(347 + 99) = 888 \text{ m} \]

3. A rectangle with whole number side lengths has an area of 24 square centimeters and a perimeter of 22 centimeters. Find the length and width of the rectangle.

   \[ \text{Area} = \text{length} \times \text{width} \\ 24 = \text{length} \times \text{width} \]

   \[ \text{Perimeter} = 2(\text{length} + \text{width}) = 22 \\ \text{length} + \text{width} = 11 \]

   From the area, possible dimensions are 3 cm x 8 cm or 4 cm x 6 cm. From the perimeter, only 4 cm x 6 cm satisfies both conditions.
Name ____________________________ Date ________________

1. Determine the perimeter and area of rectangles A and B.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 cm</td>
<td>4 cm</td>
</tr>
</tbody>
</table>

A = ____________
P = ____________

A = ____________
P = ____________

2. Determine the perimeter and area of each rectangle.
   a. 
   
   P = ____________
   A = ____________

   b. 
   
   P = ____________
   A = ____________

3. Determine the perimeter of each rectangle.
   a. 
   
   P = ____________

   b. 
   
   P = ____________
4. Given the rectangle’s area, find the unknown side length.
   a. \[ \text{Area} = 6 \text{ cm} \times x \text{ cm} \]
      \[ x = \quad \]
   b. \[ \text{Area} = 5 \text{ m} \times 25 \text{ m} \]
      \[ x = \quad \]

5. Given the rectangle’s perimeter, find the unknown side length.
   a. \[ \text{Perimeter} = 180 \text{ cm} \]
      \[ x = 40 \text{ cm} \]
      \[ x = \quad \]
   b. \[ \text{Perimeter} = 1,000 \text{ m} \]
      \[ x = \quad \]

6. Each of the following rectangles has whole number side lengths. Given the area and perimeter, find the length and width.
   a. \[ \text{Area} = 32 \text{ square cm} \]
      \[ \text{Perimeter} = 24 \text{ cm} \]
      \[ l = \quad \]
      \[ w = \quad \]
   b. \[ \text{Area} = 36 \text{ square m} \]
      \[ \text{Perimeter} = 30 \text{ m} \]
      \[ w = \quad \]
      \[ l = \quad \]
1. A rectangular porch is 4 feet wide. It is 3 times as long as it is wide.
   a. Label the diagram with the dimensions of the porch.

   ![Diagram of a rectangular porch](image)

   b. Find the perimeter of the porch.

2. A narrow rectangular banner is 5 inches wide. It is 6 times as long as it is wide.
   a. Draw a diagram of the banner and label its dimensions.

   ![Diagram of a rectangular banner](image)

   b. Find the perimeter and area of the banner.
3. The area of a rectangle is 42 square centimeters. Its length is 7 centimeters.
   
a. What is the width of the rectangle?

   b. Charlie wants to draw a second rectangle that is the same length but is 3 times as wide. Draw and label Charlie’s second rectangle.

   c. What is the perimeter of Charlie’s second rectangle?

4. The area of Betsy’s rectangular sandbox is 20 square feet. The longer side measures 5 feet. The sandbox at the park is twice as long and twice as wide as Betsy’s.

   a. Draw and label a diagram of Betsy’s sandbox. What is its perimeter?

   b. Draw and label a diagram of the sandbox at the park. What is its perimeter?
Lesson 2 Problem Set

c. What is the relationship between the two perimeters?

d. Find the area of the park’s sandbox using the formula \( A = l \times w \).

e. The sandbox at the park has an area that is how many times that of Betsy’s sandbox?

f. Compare the way the perimeter changed with the way the area changed between the two sandboxes. Explain what you notice using words, pictures, or numbers.
Lesson 2 Exit Ticket

Name ______________________________ Date __________________

1. A balance beam at a playground is 2 feet wide. It is 6 times as long as it is wide.
   
   a. Label the diagram with the dimensions of the balance beam.

   
   
   

   b. Find the perimeter of the balance beam.

2. A blanket is 4 feet wide. It is 3 times as long as it is wide.
   
   a. Draw a diagram of the blanket and label its dimensions.

   
   
   

   b. Find the perimeter and area of the blanket.
Name _______________________________ Date __________________

1. A rectangular pool is 7 feet wide. It is 3 times as long as it is wide.
   
   a. Label the diagram with the dimensions of the pool.

   
   
   b. Find the perimeter of the pool.

2. A rectangular bumper sticker is 3 inches long. It is 4 times as wide as it is long.
   
   a. Draw a diagram of the bumper sticker and label its dimensions.

   
   
   b. Find the perimeter and area of the bumper sticker.
3. The area of a rectangle is 36 square centimeters and its length is 9 centimeters.
   a. What is the width of the rectangle?
   b. Elsa wants to draw a second rectangle that is the same length but is 3 times as wide. Draw and label Elsa’s second rectangle.
   c. What is the perimeter of Elsa’s second rectangle?

4. The area of Nathan’s bedroom rug is 15 square feet. The longer side measures 5 feet. His living room rug is twice as long and twice as wide as the bedroom rug.
   a. Draw and label a diagram of Nathan’s bedroom rug. What is its perimeter?
   b. Draw and label a diagram of Nathan’s living room rug. What is its perimeter?
c. What is the relationship between the two perimeters?

d. Find the area of the living room rug using the formula $A = l \times w$.

e. The living room rug has an area that is how many times that of the bedroom rug?

f. Compare the way the perimeter changed with the way the area changed between the two rugs. Explain what you notice using words, pictures, or numbers.
Lesson 3 Problem Set

Demonstrate understanding of area and perimeter formulas by solving multi-step real world problems.

Date: 8/28/13

1. The projection screen in the school auditorium is 5 times as long and 5 times as wide as the screen in the library. The screen in the library is 4 feet long with a perimeter of 14 feet. What is the perimeter of the screen in the auditorium?

2. The width of David’s tent is 5 feet. The length is twice the width. David’s rectangular air mattress measures 3 feet by 6 feet. If David puts the air mattress in the tent, how many square feet of floor space will be available for the rest of his things?

3. Jackson’s bedroom has an area of 90 square feet. The area of his bedroom is 9 times that of his closet. If the closet is 2 feet wide, what is its length?

4. The length of a rectangular deck is 4 times its width. If the deck’s perimeter is 30 feet, what is the deck’s area?
Solve the following problem. Use pictures, words, or diagrams to help you solve.

1. A poster is 3 times as long as it is wide. A banner is 5 times as long as it is wide. Both the banner and the poster have perimeters of 24 inches. What are the length and width of the poster and the banner?
Lesson 4 Problem Set

Name _______________________________ Date __________________________

Example:

\[ 5 \times 10 = \underline{50} \]

5 ones × 10 = \underline{5 tens}

Draw number disks and arrows as shown to represent each product.

1. \[ 5 \times 100 = \underline{\quad} \]

\[ 5 \times 10 \times 10 = \underline{\quad} \]

5 ones × 100 = \underline{\quad}

2. \[ 5 \times 1,000 = \underline{\quad} \]

\[ 5 \times 10 \times 10 \times 10 = \underline{\quad} \]

5 ones × 1,000 = \underline{\quad}

3. Complete the following equations.

a. \[ 6 \times 10 = \underline{\quad} \]

b. \underline{\quad} × 6 = 600
c. \[ 6,000 = \underline{\quad} \times 1,000 \]
d. \[ 10 \times 4 = \underline{\quad} \]
e. \[ 4 \times \underline{\quad} = 400 \]
f. \[ \underline{\quad} \times 4 = 4,000 \]
g. \[ 1,000 \times 9 = \underline{\quad} \]
h. \[ \underline{\quad} = 10 \times 9 \]
i. \[ 900 = \underline{\quad} \times 100 \]
Draw number disks and arrows as shown to represent each product.

4. \(12 \times 10 = \underline{\phantom{0000}}\)

\[(1 \text{ ten} 2 \text{ ones}) \times 10 = \underline{\phantom{0000}} \underline{\phantom{0000}}\]

5. \(18 \times 100 = \underline{\phantom{0000}}\)

\[18 \times 10 \times 10 = \underline{\phantom{0000}}\]

\[(1 \text{ ten} 8 \text{ ones}) \times 100 = \underline{\phantom{0000}} \underline{\phantom{0000}}\]

6. \(25 \times 1,000 = \underline{\phantom{0000}}\)

\[25 \times 10 \times 10 \times 10 = \underline{\phantom{0000}}\]

\[(2 \text{ tens} 5 \text{ ones}) \times 1,000 = \underline{\phantom{0000}} \underline{\phantom{0000}}\]

Decompose each multiple of 10, 100, or 1,000 before multiplying.

7. \(3 \times 40 = 3 \times 4 \times \underline{\phantom{0000}}\)

\[= 12 \times \underline{\phantom{0000}}\]

\[= \underline{\phantom{0000}}\]

8. \(3 \times 200 = 3 \times \underline{\phantom{0000}} \times \underline{\phantom{0000}}\)

\[= \underline{\phantom{0000}} \times \underline{\phantom{0000}}\]

\[= \underline{\phantom{0000}}\]

9. \(4 \times 4,000 = \underline{\phantom{0000}} \times \underline{\phantom{0000}} \times \underline{\phantom{0000}}\)

\[= \underline{\phantom{0000}} \times \underline{\phantom{0000}}\]

\[= \underline{\phantom{0000}}\]

10. \(5 \times 4,000 = \underline{\phantom{0000}} \times \underline{\phantom{0000}} \times \underline{\phantom{0000}}\)

\[= \underline{\phantom{0000}} \times \underline{\phantom{0000}}\]

\[= \underline{\phantom{0000}}\]
1. Complete the following equations.
   a. 5 \times 10 = 
   b. \underline{100} \times 5 = 500
   c. 5,000 = \underline{5} \times 1,000
   
   d. 10 \times 2 = 
   e. \underline{100} \times 20 = 2,000
   f. 2,000 = 10 \times 
   
   g. 100 \times 18 = 
   h. \underline{80} = 10 \times 32
   i. 4,800 = \underline{48} \times 1,000
   
   j. 60 \times 4 = 
   k. 5 \times 600 = 
   l. 8,000 \times 5 = 

Example:

\[ 5 \times 10 = \underline{50} \]

5 ones \times 10 = \underline{50} tens

Draw number disks and arrows as shown to represent each product.

1. \( 7 \times 100 = \underline{700} \)

\[ 7 \times 10 \times 10 = \underline{700} \]

7 ones \times 100 = \underline{700} ones

2. \( 7 \times 1,000 = \underline{7,000} \)

\[ 7 \times 10 \times 10 \times 10 = \underline{7,000} \]

7 ones \times 1,000 = \underline{7,000} ones

3. Complete the following equations.

a. \( 8 \times 10 = \underline{80} \)

\[ \underline{8} \times 8 = 800 \]

\[ 8,000 = \underline{8} \times 1,000 \]

d. \( 10 \times 3 = \underline{30} \)

\[ 3 \times \underline{1000} = 3,000 \]

\[ \underline{10} \times 3 = 300 \]

g. \( 1,000 \times 4 = \underline{4000} \)

\[ \underline{400} = 10 \times 4 \]

\[ 400 = \underline{40} \times 100 \]
Draw number disks and arrows as shown to represent each product.

4. \(15 \times 10 = \underline{\hspace{1cm}}\)
   \((1 \text{ ten } 5 \text{ ones}) \times 10 = \underline{\hspace{1cm}}\)

5. \(17 \times 100 = \underline{\hspace{1cm}}\)
   \(17 \times 10 \times 10 = \underline{\hspace{1cm}}\)
   \((1 \text{ ten } 7 \text{ ones}) \times 100 = \underline{\hspace{1cm}}\)

6. \(36 \times 1,000 = \underline{\hspace{1cm}}\)
   \(36 \times 10 \times 10 \times 10 = \underline{\hspace{1cm}}\)
   \((3 \text{ tens } 6 \text{ ones}) \times 1,000 = \underline{\hspace{1cm}}\)

Decompose each multiple of 10, 100, or 1,000 before multiplying.

7. \(2 \times 80 = 2 \times 8 \times \underline{\hspace{1cm}}\)
   \(= 16 \times \underline{\hspace{1cm}}\)
   \(= \underline{\hspace{1cm}}\)

8. \(2 \times 400 = 2 \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\)
   \(= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\)
   \(= \underline{\hspace{1cm}}\)

9. \(5 \times 5,000 = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\)
   \(= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\)
   \(= \underline{\hspace{1cm}}\)

10. \(7 \times 6,000 = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\)
    \(= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}\)
    \(= \underline{\hspace{1cm}}\)
Lesson 5 Problem Set

Draw number disks to represent the value of the following expressions.

1. \(2 \times 3 = \ldots\)
   2 times _____ ones is _____ ones.

2. \(2 \times 30 = \ldots\)
   2 times _____ tens is _____ _________.

3. \(2 \times 300 = \ldots\)
   2 times _____ ____________ is _____ ____________.

4. \(2 \times 3,000 = \ldots\)
   ____ times _____ ____________ is _____ ____________.
5. Find the product.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 20 × 7 =</td>
<td>b. 3 × 60 =</td>
<td>c. 3 × 400 =</td>
<td>d. 2 × 800 =</td>
</tr>
<tr>
<td>e. 7 × 30 =</td>
<td>f. 60 × 6 =</td>
<td>g. 400 × 4 =</td>
<td>h. 4 × 8,000 =</td>
</tr>
<tr>
<td>i. 5 × 30 =</td>
<td>j. 5 × 60 =</td>
<td>k. 5 × 400 =</td>
<td>l. 8,000 × 5 =</td>
</tr>
</tbody>
</table>

6. Brianna buys 3 packs of balloons for a party. Each pack has 60 balloons. How many balloons does Brianna have?

7. Jordan has twenty times as many baseball cards as his brother. His brother has 9 cards. How many cards does Jordan have?

8. The aquarium has 30 times as many fish in one tank as Jacob has. The aquarium has 90 fish. How many fish does Jacob have?
Lesson 5 Exit Ticket

Name ____________________________ Date __________________

Draw number disks to represent the value of the following expressions.

1. \( 4 \times 200 = \______ \)

   2. \( 4 \times 2,000 = \______ \)

\[ \begin{array}{c}
200 \\
\times \\
4 \\
\hline \\
\end{array} \]

\[ \begin{array}{c}
2,000 \\
\times \\
4 \\
\hline \\
\end{array} \]

4 times ______  ____________ is _______  _____________ .

4 times ______  ____________ is _______  _____________ .

2. \( 4 \times 2,000 = \______ \)

   _____ times ______  ____________ is _______  _____________ .

3. Find the product.

   a. \( 30 \times 3 = \)  
   
   b. \( 8 \times 20 = \)  
   
   c. \( 6 \times 400 = \)  
   
   d. \( 2 \times 900 = \)  
   
   e. \( 8 \times 80 = \)  
   
   f. \( 30 \times 4 = \)  
   
   g. \( 500 \times 6 = \)  
   
   h. \( 8 \times 5,000 = \)  

4. Bonnie worked for 7 hours each day for 30 days. How many hours did she work altogether?
Draw number disks to represent the value of the following expressions.

1. \(5 \times 2 = \) \_
   
   \(5 \times \) ones is \(\) ones.

2. \(5 \times 20 = \) \_
   
   \(5 \times \) tens is \(\) ten.

3. \(5 \times 200 = \) \_
   
   \(5 \times \) _____ is \(\) hundred.

4. \(5 \times 2,000 = \) \_
   
   \(\) times \(\) is \(\) thousand.
5. Find the product.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $20 \times 9 = $</td>
<td>b. $6 \times 70 = $</td>
<td>c. $7 \times 700 = $</td>
<td>d. $3 \times 900 = $</td>
</tr>
<tr>
<td>e. $9 \times 90 = $</td>
<td>f. $40 \times 7 = $</td>
<td>g. $600 \times 6 = $</td>
<td>h. $8 \times 6,000 = $</td>
</tr>
<tr>
<td>i. $5 \times 70 = $</td>
<td>j. $5 \times 80 = $</td>
<td>k. $5 \times 200 = $</td>
<td>l. $6,000 \times 5 = $</td>
</tr>
</tbody>
</table>

6. At the school cafeteria, each student who ordered lunch gets 6 chicken nuggets. The cafeteria staff prepares enough for 300 kids. How many chicken nuggets does the cafeteria staff prepare altogether?

7. Jaelynn has thirty times as many stickers as her brother. Her brother has 8 stickers. How many stickers does Jaelynn have?

8. The flower shop has 40 times as many flowers in one cooler as Julia has in her bouquet. The cooler has 120 flowers. How many flowers are in Julia’s bouquet?
Represent the following problem by drawing disks in the place value chart.

1. To solve $20 \times 40$, think:

   \[
   (2 \text{ tens} \times 4) \times 10 = \quad \quad \\
   20 \times (4 \times 10) = \quad \quad \\
   20 \times 40 = \quad \quad 
   \]

   

   

   

   

   

2. Draw an area model to represent $20 \times 40$.

   2 tens × 4 tens = ______

3. Draw an area model to represent $30 \times 40$.

   3 tens × 4 tens = ______

   30 × 40 = ______
4. Draw an area model to represent $20 \times 50$.

\[
\begin{align*}
2 \text{ tens} \times 5 \text{ tens} &= ____ \quad ________ \\
20 \times 50 &= ______
\end{align*}
\]

Rewrite each equation in unit form and solve.

5. \hspace{1cm} 20 \times 20 = ______ \\
\hspace{1cm} 2 \text{ tens} \times 2 \text{ tens} = ____ \text{ hundreds} \\

6. \hspace{1cm} 60 \times 20 = ______ \\
\hspace{1cm} 6 \text{ tens} \times 2 \text{ _______} = ____ \text{ hundreds} \\

7. \hspace{1cm} 70 \times 20 = ______ \\
\hspace{1cm} ____ \text{ tens} \times ____ \text{ tens} = 14 \quad ________ \\

8. \hspace{1cm} 70 \times 30 = ______ \\
\hspace{1cm} ____ \text{ _______} \times ____ \text{ _______} = ___ \text{ hundreds} \\

9. If there are 40 seats per row, how many seats are in 90 rows?

10. One ticket to the symphony costs $50. How much money is collected if 80 tickets are sold?
Name _____________________________ Date ___________________

Represent the following problem by drawing disks in the place value chart.

1. To solve 20 \times 30, think:

\begin{align*}
(2 \text{ tens} \times 3) \times 10 &= \underline{\phantom{0}} \\
20 \times (3 \times 10) &= \underline{\phantom{0}} \\
20 \times 30 &= \underline{\phantom{0}}
\end{align*}

\[
\begin{array}{ccc}
\text{Hundreds} & \text{Tens} & \text{Ones} \\
\hline
\text{Place Value Chart} \\
\hline
\end{array}
\]

2. Draw an area model to represent 20 \times 30.

2 \text{ tens} \times 3 \text{ tens} = \underline{\phantom{00}} \underline{\phantom{0}}

3. Every night, Eloise reads 40 pages. How many pages total does she read at night during the 30 days of November?
Name ____________________________ Date ________________

Represent the following problem by drawing disks in the place value chart.

1. To solve 30 × 60, think:

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3 tens × 6) × 10 = ________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 × (6 × 10) = ________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 × 60 = ________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Draw an area model to represent 30 × 60.

3 tens × 6 tens = _____ _________

3. Draw an area model to represent 20 × 20.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tens × 2 tens = _____ _________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 × 20 = ______</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Draw an area model to represent $40 \times 60$.

\[
4 \text{ tens} \times 6 \text{ tens} = \underline{\quad} \underline{\quad} \\
40 \times 60 = \underline{\quad}
\]

Rewrite each equation in unit form and solve.

5. $50 \times 20 = \underline{\quad}$  \\
   $5 \text{ tens} \times 2 \text{ tens} = \underline{\quad} \text{ hundreds}$

6. $30 \times 50 = \underline{\quad}$  \\
   $3 \text{ tens} \times 5 \underline{\quad} = \underline{\quad} \text{ hundreds}$

7. $60 \times 20 = \underline{\quad}$  \\
   $\underline{\quad} \text{ tens} \times \underline{\quad} \text{ tens} = 12 \underline{\quad}$

8. $40 \times 70 = \underline{\quad}$  \\
   $\underline{\quad} \underline{\quad} \times \underline{\quad} \underline{\quad} = \underline{\quad} \text{ hundreds}$
9. There are 60 seconds in a minute and 60 minutes in an hour. How many seconds are in one hour?

10. To print a comic book, 50 pieces of paper are needed. How many pieces of paper are needed to print 40 comic books?
Lesson 7 Problem Set

1. Represent the following expressions with disks, regrouping as necessary, writing a matching expression, and recording the partial products vertically as shown below.

   a. \( 1 \times 43 \)

      \[
      \begin{array}{c|c}
      \text{tens} & \text{ones} \\
      \hline
      \bullet \bullet \bullet & \bullet \bullet \bullet \\
      \end{array}
      \]

      \( 1 \times 4 \text{ tens} + 1 \times 3 \text{ ones} \)

   b. \( 2 \times 43 \)

      \[
      \begin{array}{c|c}
      \text{tens} & \text{ones} \\
      \hline
      & \\
      \end{array}
      \]

   c. \( 3 \times 43 \)

      \[
      \begin{array}{c|c|c}
      \text{hundreds} & \text{tens} & \text{ones} \\
      \hline
      & & \\
      \end{array}
      \]
2. Represent the following expressions with disks, regrouping as necessary. To the right, record the partial products vertically.

   a. $2 \times 36$

   b. $3 \times 61$

   c. $4 \times 84$
1. Represent the following expressions with disks, regrouping as necessary. To the right, record the partial products vertically.

a. $6 \times 41$

b. $7 \times 31$
1. Represent the following expressions with disks, regrouping as necessary, writing a matching expression, and recording the partial products vertically.

   a. \(3 \times 24\)

   b. \(3 \times 42\)

   c. \(4 \times 34\)
2. Represent the following expressions with disks, regrouping as necessary. To the right, record the partial products vertically.

   a. $4 \times 27$

   b. $5 \times 42$

3. Cindy says she found a shortcut for doing multiplication problems. When she multiplies $3 \times 24$, she says, “$3 \times 4$ is 12 ones, or 1 ten and 2 ones. Then there’s just 2 tens left in 24, so add it up and you get 3 tens and 2 ones.” Do you think Cindy’s shortcut works? Explain your thinking in words and justify your response using a model or partial products.
1. Represent the following expressions with disks, regrouping as necessary, writing a matching expression, and recording the partial products vertically as shown below.

a. $1 \times 213$

b. $2 \times 213$

c. $3 \times 214$
d. \(3 \times 1,254\)

<table>
<thead>
<tr>
<th>thousands</th>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
</table>

2. Represent the following expressions with disks, using either method shown during the class, renaming as necessary. To the right, record the partial products vertically.

a. \(3 \times 212\)

b. \(2 \times 4,036\)

c. \(3 \times 2,546\)

d. \(3 \times 1,407\)

3. Every day at the bagel factory, Cyndi makes 5 different kinds of bagels. If she makes 144 of each kind, what is the total number of bagels that she makes?
1. Represent the following expressions with disks, regrouping as necessary. To the right, record the partial products vertically.

   a. $4 \times 513$

   b. $3 \times 1,054$
1. Represent the following expressions with disks, regrouping as necessary, writing a matching expression, and recording the partial products vertically as shown below.

a. $2 \times 424$

```
<table>
<thead>
<tr>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

\[
\begin{array}{c}
4 \\
2 \\
2
\end{array}
\]

\[
\Rightarrow 2 \times \underline{\text{ones}}
\]

\[
\Rightarrow 2 \times \underline{\text{____}}
\]

\[
\Rightarrow \underline{\text{____}} \times \underline{\text{____}}
\]

\[
2 \times \underline{\text{____}} + 2 \times \underline{\text{____}} + 2 \times \underline{\text{ones}}
\]

b. $3 \times 424$

```
<table>
<thead>
<tr>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
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2. Represent the following expressions with disks, using either method shown in the class, regrouping as necessary. To the right, record the partial products vertically.
   
   a. $2 \times 617$
   
   b. $5 \times 642$
   
   c. $3 \times 3,034$

3. Every day, Penelope jogs three laps around the playground to keep in shape. The playground is rectangular with a width of 163 meters and a length of 320 meters.
   
   a. Find the total amount of meters in one lap.
   
   b. Determine how many meters Penelope jogs in three laps.
1. Solve using each method.

<table>
<thead>
<tr>
<th>Partial Products</th>
<th>Standard Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 3 4</td>
<td>3 4</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>b) 2 2 4</td>
<td>2 2 4</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

2. Solve. Use the standard algorithm.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 2 5 1</td>
<td>1 3 5</td>
<td>3 0 4</td>
</tr>
<tr>
<td>× 3</td>
<td>× 6</td>
<td>× 9</td>
</tr>
<tr>
<td>d) 4 0 5</td>
<td>e) 3 1 6</td>
<td>f) 3 9 2</td>
</tr>
<tr>
<td>× 4</td>
<td>× 5</td>
<td>× 6</td>
</tr>
</tbody>
</table>
3. The product of 7 and 86 is _______.

4. 9 times as many as 457 is _______.

5. Jashawn wants to make 5 airplane propellers. He needs 18 cm of wood for each propeller. How many centimeters of wood will he use?

6. One game system costs $238. How much will 4 game systems cost?

7. A small bag of chips weighs 48 g. A large bag of chips weighs three times as much as the small bag. How much will 7 large bags of chips weigh?
1. Solve using the standard algorithm.

   a. \[
   \begin{array}{c}
   \phantom{608} \\
   \times \phantom{9}
   \end{array}
   \]
   \[
   \begin{array}{c}
   6 \phantom{0}
   \\
   0 \phantom{8}
   \\
   8
   \end{array}
   \]
   \[
   \begin{array}{c}
   \phantom{9}
   \end{array}
   \]

   b. \[
   \begin{array}{c}
   \phantom{574} \\
   \times \phantom{7}
   \end{array}
   \]
   \[
   \begin{array}{c}
   5 \phantom{7}
   \\
   7 \phantom{4}
   \\
   4
   \end{array}
   \]
   \[
   \begin{array}{c}
   \phantom{7}
   \end{array}
   \]

2. Morgan is 23 years old. Her grandfather is 4 times as old. How old is her grandfather?
Lesson 9 Homework

Name __________________________________________ Date ________________

1. Solve using each method.

<table>
<thead>
<tr>
<th>Partial Products</th>
<th>Standard Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 4 6</td>
<td>4 6</td>
</tr>
<tr>
<td>× 2</td>
<td>× 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partial Products</th>
<th>Standard Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) 3 1 5</td>
<td>3 1 5</td>
</tr>
<tr>
<td>× 4</td>
<td>× 4</td>
</tr>
</tbody>
</table>

2. Solve. Use the standard algorithm.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 2 3 2</td>
<td>b) 1 4 2</td>
<td>c) 3 1 4</td>
<td></td>
</tr>
<tr>
<td>× 4</td>
<td>× 6</td>
<td>× 7</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>d) 4 4 0</td>
<td>e) 5 0 7</td>
<td>f) 3 8 4</td>
<td></td>
</tr>
<tr>
<td>× 3</td>
<td>× 8</td>
<td>× 9</td>
<td></td>
</tr>
</tbody>
</table>

3. What is the product of 8 and 54?
4. Isabel earned 350 points while she was playing Blasting Robot. Isabel’s mom earned 3 times as many points as Isabel. How many points did Isabel’s mom earn?

5. To get enough money to go to on a field trip, every student in a club has to raise $53 selling chocolate bars. There are 9 students in the club. How much money does the club need to raise to go on the field trip?

6. Mr. Meyers wants to order 4 tablets for his classroom. Each tablet costs $329. How much will all four tablets cost?

7. Amaya read 64 pages last week. Amaya’s older brother, Rogelio, read twice as many pages in the same amount of time. Their big sister, Elianna, is in high school and read 4 times as many pages as Rogelio did. How many pages did Elianna read last week?
1. Solve using the standard algorithm.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 3 \times 42</td>
<td>b. 6 \times 42</td>
</tr>
<tr>
<td>c. 6 \times 431</td>
<td>d. 3 \times 431</td>
</tr>
<tr>
<td>e. 3 \times 6,212</td>
<td>f. 3 \times 3,106</td>
</tr>
<tr>
<td>g. 4 \times 4,309</td>
<td>h. 4 \times 8,618</td>
</tr>
</tbody>
</table>
2. There are 365 days in a common year. How many days are in 3 common years?

3. The length of one side of a square city block is 462 meters. What is the perimeter of the block?

4. Jake ran 2 miles. Jesse ran 4 times as far. There are 5,280 feet in a mile. How many feet did Jesse run?
Lesson 10 Exit Ticket

Name ________________________________ Date ____________________

1. Solve using the standard algorithm.
   a. 2,348 × 6
   b. 1,679 × 7

2. A farmer planted 4 rows of sunflowers. There were 1,205 plants in each row. How many sunflowers did he plant?
Lesson 10 Homework

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

1. Solve using the standard algorithm.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $3 \times 41$</td>
<td>b. $9 \times 41$</td>
</tr>
<tr>
<td>c. $7 \times 143$</td>
<td>d. $7 \times 286$</td>
</tr>
<tr>
<td>e. $4 \times 2,048$</td>
<td>f. $4 \times 4,096$</td>
</tr>
<tr>
<td>g. $8 \times 4,096$</td>
<td>h. $4 \times 8,192$</td>
</tr>
</tbody>
</table>
2. One gallon of water contains 128 fluid ounces. Robert’s family brings six gallons of water for the players on the football team. How many fluid ounces are in six gallons?

3. It takes 687 Earth days for the planet Mars to revolve around the Sun once. How many Earth days does it take Mars to revolve around the Sun four times?

4. Tammy buys a 4-gigabyte memory card for her camera. Dijonea buys a memory card with twice as much storage as Tammy’s. One gigabyte is 1,024 megabytes. How many megabytes of storage does Dijonea have on her memory card?
1. Solve the following expressions using the standard algorithm, the partial products method, and the area model.

a. \(425 \times 4\)

4 \((400 + 20 + 5)\)

\((4 \times \underline{\quad}) + (4 \times \underline{\quad}) + (4 \times \underline{\quad})\)

b. \(534 \times 7\)

7 \((\underline{\quad} + \underline{\quad} + \underline{\quad})\)

\((\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})\)

c. \(209 \times 8\)

__ \((\underline{\quad} + \underline{\quad})\)

\((\underline{\quad} \times \underline{\quad}) + (\underline{\quad} \times \underline{\quad})\)
2. Solve using the partial products method.

Cayla’s school has 258 students. Janet’s school has 3 times as many students as Cayla’s. How many students are in Janet’s school?

3. Model with a tape diagram and solve.

4 times as much as 467.

Solve using the standard algorithm, the area model, the distributive property, or the partial products method.

4. \(5,131 \times 7\)

5. 3 times as many as 2,805.

6. A restaurant sells 1,725 pounds of spaghetti and 925 pounds of linguini every month. After 9 months, how many pounds of pasta does the restaurant sell? Write your answer as a statement.
Lesson 11 Exit Ticket

Name ___________________________ Date ________________

1. Solve using the standard algorithm, the area model, the distributive property, or the partial products method.

   \[2,809 \times 4\]

2. The monthly school newspaper is 9 pages long. Mrs. Smith needs to print 675 copies. How many sheets of paper will she use?
Lesson 11 Homework

1. Solve the following expressions using the standard algorithm, the partial products method, and the area model.

   a. \(302 \times 8\)

   \[
   8 (300 + 2)
   \]

   \[
   (8 \times \underline{\text{____}}) + (8 \times \underline{\text{____}})
   \]

   b. \(216 \times 5\)

   \[
   5 (\underline{\text{____}} + \underline{\text{____}} + \underline{\text{____}})
   \]

   \[
   (\underline{\text{____}} \times \underline{\text{____}}) + (\underline{\text{____}} \times \underline{\text{____}}) + (\underline{\text{____}} \times \underline{\text{____}})
   \]

   c. \(593 \times 9\)

   \[
   \underline{\text{____}} (\underline{\text{____}} + \underline{\text{____}} + \underline{\text{____}})
   \]

   \[
   (\underline{\text{____}} \times \underline{\text{____}}) + (\underline{\text{____}} \times \underline{\text{____}}) + (\underline{\text{____}} \times \underline{\text{____}})
   \]
2. Solve using the partial products method.

On Monday 475 people visited the museum. On Saturday there were 4 times as many visitors as there were on Monday. How many people visited the museum on Saturday?

3. Model with a tape diagram and solve.

6 times as much as 384.

Solve using the standard algorithm, the area model, the distributive property, or the partial products method.

4. \(6,253 \times 3\)

5. 7 times as many as 3,073.

6. A cafeteria makes 2,516 pounds of white rice and 608 pounds of brown rice every month. After 6 months, how many pounds of rice does the cafeteria make? Write your answer as a statement.
Name ____________________________ Date ______________________

Use the RDW process to solve the following problems.

1. The table shows the cost of party favors. Each party guest receives a bag with 1 balloon, 1 lollipop, and 1 bracelet. What is the total cost for 9 guests?

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 balloon</td>
<td>26¢</td>
</tr>
<tr>
<td>1 lollipop</td>
<td>14¢</td>
</tr>
<tr>
<td>1 bracelet</td>
<td>33¢</td>
</tr>
</tbody>
</table>

2. The Turner family uses 548 liters of water per day. The Hill family uses 3 times as much water per day. How much water does the Hill family use per week?

3. Jayden has 347 marbles. Elvis has 4 times as many as Jayden. Presley has 799 fewer than Elvis. How many marbles does Presley have?
4.
   a. Write an equation that would allow someone to find the value of R.

   \[
   \begin{array}{c}
   & 1167 & 1167 & 1167 \\
   \hline
   & \text{239} & R & \\
   \end{array}
   \]

   b. Write your own word problem to correspond to this tape diagram, then solve.
Name ___________________________ Date ________________

Use the RDW process to solve the following problem.

1. Jennifer has 256 pink beads. Stella has 3 times as many beads as Jennifer. Tiah has 104 more beads than Stella. How many beads does Tiah have?
Use the RDW process to solve the following problems.

1. The table shows the number of stickers of various types in Chrissy’s new sticker book. Chrissy’s six friends also own the same sticker book. How many stickers do Chrissy and her six friends have altogether?

<table>
<thead>
<tr>
<th>Type of Sticker</th>
<th>Number of Stickers</th>
</tr>
</thead>
<tbody>
<tr>
<td>flowers</td>
<td>32</td>
</tr>
<tr>
<td>smiley faces</td>
<td>21</td>
</tr>
<tr>
<td>hearts</td>
<td>39</td>
</tr>
</tbody>
</table>

2. The small copier makes 437 copies each day. The large copier makes 4 times as many copies each day. How many copies does the large copier make each week?

3. Jared sold 194 Boy Scout chocolate bars. Matthew sold three times as many as Jared. Gary sold 297 fewer than Matthew. How many bars did Gary sell?
4. a. Label the rest of the diagram below. Solve for M.

\[
\begin{array}{c}
973 \text{ meters} \\
723 \text{ meters} \\
\hline
\text{M}
\end{array}
\]

b. Write your own problem that could be solved using the diagram above.
Lesson 13 Problem Set

Name ____________________________ Date ______________

Solve using the RDW process.

1. Over the summer, Kate earned $180 each week for 7 weeks. Of that money, she spent $375 on a new computer and $137 on new clothes. How much money did she have left?

2. Sylvia weighed 8 pounds when she was born. By her first birthday, her weight had tripled. By her second birthday, she had gained 12 more pounds. At that time, Sylvia’s father weighed 5 times as much as she did. What was Sylvia and her dad’s combined weight?
3. Three boxes weighing 128 pounds each and one box weighing 254 pounds were loaded onto the back of an empty truck. A crate of apples was then loaded onto the same truck. If the total weight loaded onto the truck was 2,000 pounds, how much did the crate of apples weigh?

4. In one month, Charlie read 814 pages. In the same month, his mom read 4 times as many pages as Charlie, and that was 143 pages more than Charlie’s dad read. What was the total number of pages read by Charlie and his parents?
1. Solve using the RDW process.
   a. Michael earns $9 per hour. He works 28 hours each week. How much will he earn in 6 weeks?
   
   b. David earns $8 per hour. He works 40 hours each week. How much will he earn in 6 weeks?
   
   c. After 6 weeks who earned more money? How much more money?
Name _______________________________ Date ____________________

Solve using the RDW process.

1. A pair of jeans costs $89. A jean jacket costs twice as much. What is the total cost of a jean jacket and 4 pairs of jeans?

2. Sarah bought a shirt on sale for $35. The original price of the shirt was 3 times that amount. Sarah also bought a pair of shoes on sale for $28. The original price of the shoes was 5 times that amount. How much money did the shirt and shoes cost before they went on sale?
3. All 3,000 seats in a theater are being replaced. So far, 5 sections of 136 seats and a sixth section containing 348 seats have been replaced. How many more seats do they still need to replace?

4. Computer Depot sold 762 reams of paper. Paper Palace sold 3 times as much paper as Computer Depot and 143 reams more than Office Supply Central. How many reams of paper were sold by all three stores combined?
Lesson 14 Problem Set

Name ____________________________ Date ________________

Solve the following problems. Use the RDW process.

1. There are 19 identical socks. How many pairs of socks are there? Will there be any socks without a match? If so, how many?

2. If it takes 8 inches of ribbon to make a bow, how many bows can be made from 3 feet of ribbon (1 foot = 12 inches)? Will any ribbon be left over? If so, how much?

3. The library has 27 chairs and 5 tables. If the same number of chairs is placed at each table, how many chairs can be placed at each table? Will there be any extra chairs? If so, how many?
Lesson 14 Problem Set

4. The baker has 42 kilograms of flour. She uses 8 kilograms each day. After how many days will she need to buy more flour?

5. Caleb has 76 apples. He wants to bake as many pies as he can. If it takes 8 apples to make each pie, how many apples will he use? How many apples will not be used?

6. Forty-five people are going to the beach. Seven people can ride in each van. How many vans will be required to get everyone to the beach?
Name __________________________ Date ________________

Solve the following problem. Use the RDW process.

1. Fifty-three students are going on a field trip to the zoo. Before the trip, a teacher forms groups of students and assigns a chaperone to each group. As much as she can, the teacher divides the students into groups of 6. How many groups of students will there be? Will each group have 6 students? How many total chaperones are needed?
Lesson 14 Homework

Solve the following problems. Use the RDW process.

1. Linda makes booklets using 2 sheets of paper. She has 17 sheets of paper. How many of these booklets can she make? Will she have any extra paper? How many sheets?

2. Linda uses thread to sew the booklets together. She cuts 6 inches of thread for each booklet. How many booklets can she stitch with 50 inches of thread? Will she have any unused thread after stitching up the booklets? If so, how much?

3. Ms. Rochelle wants to put her 29 students into groups of 6. How many groups of 6 can she make? If she puts any remaining students in a smaller group, how many students will be in that group?
4. A trainer gives his horse, Caballo, 7 gallons of water every day from a 57-gallon container. How many days will Caballo receive his full portion of water from the container? On which number day will the trainer need to refill the container of water?

5. Meliza has 43 toy soldiers. She lines them up in rows of 5 to fight imaginary zombies. How many of these rows can she make? After making as many rows of 5 as she can, she puts the remaining soldiers in the last row. How many soldiers are in that row?

6. Seventy-eight students are separated into groups of 8 for a field trip. How many groups are there? The remaining students form a smaller group of how many students?
<table>
<thead>
<tr>
<th>Show division using an array.</th>
<th>Show division using an area model.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. 18 ÷ 6</strong></td>
<td><img src="image1" alt="Array" /></td>
</tr>
<tr>
<td>Quotient = ________</td>
<td><img src="image2" alt="Area Model 1" /></td>
</tr>
<tr>
<td>Remainder = ________</td>
<td>Can you show 18 ÷ 6 with one rectangle? ______</td>
</tr>
<tr>
<td><strong>2. 19 ÷ 6</strong></td>
<td><img src="image3" alt="Array" /></td>
</tr>
<tr>
<td>Quotient = ________</td>
<td><img src="image4" alt="Area Model 2" /></td>
</tr>
</tbody>
</table>
| Remainder = ________         | Can you show 19 ÷ 6 with one rectangle? ______ 

Explain how you showed the remainder:
Lesson 15 Problem Set

Solve using an array and an area model. The first one is done for you.

Example: 25 ÷ 2

a. ⬤⬤⬤⬤⬤⬤⬤⬤⬤⬤⬤⬤

b. 2

Quotient = 12   Remainder = 1

3. 29 ÷ 3

a.       b.       

4. 22 ÷ 5

a.       b.       

5. 43 ÷ 4

a.       b.       

6. 59 ÷ 7

a.       b.       

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Lesson 15 Exit Ticket

Lesson 15:
Understand and solve division problems with a remainder using the array and area models.

Date: 8/28/13

Name __________________________________________ Date ______________________

Solve using an array and area model.

1. 27 ÷ 5
   a. 
   b. 

2. 32 ÷ 6
   a. 
   b.
Lesson 15 Homework

Date: 8/28/13

<table>
<thead>
<tr>
<th>Show division using an array.</th>
<th>Show division using an area model.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 24 ÷ 4</td>
<td></td>
</tr>
<tr>
<td>Quotient = __________</td>
<td></td>
</tr>
<tr>
<td>Remainder = _______</td>
<td>Can you show 24 ÷ 4 with one rectangle? _____</td>
</tr>
</tbody>
</table>

| 2. 25 ÷ 4                     |                                   |
|     Quotient = __________      |                                   |
|     Remainder = _______        | Can you show 25 ÷ 4 with one rectangle? _____ |
| Explain how you showed the remainder: |                                   |
Solve using an array and area model. The first one is done for you.

Example: $25 \div 3$

a. 

b. 

Quotient = 8   Remainder = 1

3. $44 \div 7$

a. 

b. 

4. $34 \div 6$

a. 

b. 

5. $37 \div 6$

a. 

b. 

6. $46 \div 8$

a. 

b. 
Lesson 16 Problem Set

Name _____________________________ Date ________________

Show the division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

1. \(7 \div 2\)

\[
\begin{array}{c|c}
\text{Tens} & \text{Ones} \\
\hline
2 & 7 \\
\hline
\end{array}
\]

quotient = ____________
remainder = ____________

Check Your Work
\[
\begin{array}{c|c}
\text{Tens} & \text{Ones} \\
\hline
3 & 2 \\
\hline
\end{array}
\]

\[
\begin{array}{c|c}
\text{Tens} & \text{Ones} \\
\hline
2 & 7 \\
\hline
\end{array}
\]

quotient = ____________
remainder = ____________

Check Your Work

2. \(27 \div 2\)

3. \(8 \div 3\)
Lesson 16 Problem Set

4. \(38 \div 3\)

\[
\begin{array}{c|c}
\text{Tens} & \text{Ones} \\
\hline
 & \\
\end{array}
\]

\[
3 \overline{38} \quad \text{quotient} = \quad \text{remainder} =
\]

5. \(6 \div 4\)

\[
\begin{array}{c|c}
\text{Ones} & \\
\hline
 & \\
\end{array}
\]

\[
4 \overline{6} \quad \text{quotient} = \quad \text{remainder} =
\]

6. \(86 \div 4\)

\[
\begin{array}{c|c}
\text{Tens} & \text{Ones} \\
\hline
 & \\
\end{array}
\]

\[
4 \overline{86} \quad \text{quotient} = \quad \text{remainder} =
\]
Lesson 16 Exit Ticket

Show the division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

1. 5 ÷ 3

   
   

2. 65 ÷ 3

   

Check Your Work
Name ___________________________________________  Date __________________

Show the division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

1. 7 ÷ 3

\[
\begin{array}{c|c|c}
\text{Tens} & \text{Ones} \\
\hline
\text{3} & \text{7} \\
\end{array}
\]

quotient = __________
remainder = __________

\[
\begin{array}{c}
\text{Check Your Work} \\
\text{2} \\
\times \text{3} \\
\end{array}
\]

2. 67 ÷ 3

\[
\begin{array}{c|c|c}
\text{Tens} & \text{Ones} \\
\hline
\text{3} & \text{6 7} \\
\end{array}
\]

quotient = __________
remainder = __________

\[
\begin{array}{c}
\text{Check Your Work} \\
\end{array}
\]

3. 5 ÷ 2

\[
\begin{array}{c|c}
\text{Ones} \\
\hline
\text{2} & \text{5} \\
\end{array}
\]

quotient = __________
remainder = __________

\[
\begin{array}{c}
\text{Check Your Work} \\
\end{array}
\]
Lesson 16: Understand and solve two-digit dividend division problems with a remainder in the ones place by using number disks.

Date: 8/28/13

4. \(85 \div 2\)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 \(\underline{85}\)

quotient = __________

remainder = __________

Check Your Work

5. \(5 \div 4\)

<table>
<thead>
<tr>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

4 \(\underline{5}\)

quotient = __________

remainder = __________

Check Your Work

6. \(85 \div 4\)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 \(\underline{85}\)

quotient = __________

remainder = __________

Check Your Work
Lesson 17: Represent and solve division problems requiring decomposing a remainder in the tens.

Date: 8/28/13

Name __________________________________________ Date _______________________

Show the division using disks. Relate your model to long division. Check your quotient and remainder by using multiplication and addition.

1. 5 ÷ 2
   
<table>
<thead>
<tr>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

   quotient = __________

   remainder = __________

2. 50 ÷ 2
   
<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

   quotient = __________

   remainder = __________

3. 7 ÷ 3
   
<table>
<thead>
<tr>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

   quotient = __________

   remainder = __________
4. $75 \div 3$

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$3 \overline{7} 5$

quotient = __________
remainder = __________

5. $9 \div 4$

<table>
<thead>
<tr>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

$4 \overline{9}$

quotient = __________
remainder = __________

6. $92 \div 4$

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$4 \overline{9} 2$

quotient = __________
remainder = __________
Name _______________________________________________ Date ______________________

Show the division using disks. Relate your model to long division. Check your quotient by using multiplication and addition.

1. \(5 \div 4\)

<table>
<thead>
<tr>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

\[4 \overline{5}\]

quotient = _________

remainder =__________

2. \(56 \div 4\)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[4 \overline{5 6}\]

quotient = _________

remainder =__________
Name ___________________________ Date ______________

Show the division using disks. Relate your model to long division. Check your quotient and remainder by using multiplication and addition.

1. \(7 \div 2\)

   \[
   \begin{array}{c|c}
   \text{Ones} & \text{Tens} \\
   \hline
   2 & 7 \\
   \end{array}
   \]

   \begin{align*}
   \text{quotient} &= \quad \\
   \text{remainder} &= \quad \\
   \end{align*}

2. \(73 \div 2\)

   \[
   \begin{array}{c|c}
   \text{Tens} & \text{Ones} \\
   \hline
   2 & 7 3 \\
   \end{array}
   \]

   \begin{align*}
   \text{quotient} &= \quad \\
   \text{remainder} &= \quad \\
   \end{align*}

3. \(6 \div 4\)

   \[
   \begin{array}{c|c}
   \text{Ones} & \text{Tens} \\
   \hline
   4 & 6 \\
   \end{array}
   \]

   \begin{align*}
   \text{quotient} &= \quad \\
   \text{remainder} &= \quad \\
   \end{align*}
Lesson 17 Homework

4. \(62 \div 4\)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 \(\overline{6 2}\)

quotient = __________

remainder = __________

Check Your Work

5. \(8 \div 3\)

<table>
<thead>
<tr>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

3 \(\overline{8}\)

quotient = __________

remainder = __________

Check Your Work

6. \(84 \div 3\)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 \(\overline{8 4}\)

quotient = __________

remainder = __________

Check Your Work
Name ______________________________ Date __________________

Solve using the standard algorithm. Check your quotient and remainder by using multiplication and addition.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>46 ÷ 2</td>
</tr>
<tr>
<td>2.</td>
<td>96 ÷ 3</td>
</tr>
<tr>
<td>3.</td>
<td>85 ÷ 5</td>
</tr>
<tr>
<td>4.</td>
<td>52 ÷ 4</td>
</tr>
<tr>
<td>5.</td>
<td>53 ÷ 3</td>
</tr>
<tr>
<td>6.</td>
<td>95 ÷ 4</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7.</td>
<td>$89 \div 6$</td>
</tr>
<tr>
<td>9.</td>
<td>$60 \div 3$</td>
</tr>
<tr>
<td>11.</td>
<td>$95 \div 8$</td>
</tr>
</tbody>
</table>

Lesson 18: Find whole number quotients and remainders.

Date: 8/28/13
Solve using the standard algorithm. Check your quotient and remainder by using multiplication and addition.

1. \( 93 \div 7 \)
2. \( 99 \div 8 \)
Name _______________________________ Date ___________________

Solve using the standard algorithm. Check your quotient and remainder by using multiplication and addition.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$84 ÷ 2$</td>
</tr>
<tr>
<td>3.</td>
<td>$48 ÷ 3$</td>
</tr>
<tr>
<td>5.</td>
<td>$79 ÷ 5$</td>
</tr>
</tbody>
</table>
Lesson 18 Homework

NYS COMMON CORE MATHEMATICS CURRICULUM

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>$\frac{91}{6}$</td>
</tr>
<tr>
<td>8.</td>
<td>$\frac{91}{7}$</td>
</tr>
<tr>
<td>9.</td>
<td>$\frac{87}{3}$</td>
</tr>
<tr>
<td>10.</td>
<td>$\frac{87}{6}$</td>
</tr>
<tr>
<td>11.</td>
<td>$\frac{94}{8}$</td>
</tr>
<tr>
<td>12.</td>
<td>$\frac{94}{6}$</td>
</tr>
</tbody>
</table>

Find whole number quotients and remainders.

Date: 8/28/13

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1. When you divide 94 by 3, there is a remainder of 1. Model this problem with number disks. In the number disk model, how did you show the remainder?

2. Cayman says that 94 ÷ 3 is 30 with a remainder of 4. He reasons it is correct because \((3 \times 30) + 4 = 94\). What mistake has Cayman made? Explain how he can correct his work.

3. The number disk model is showing 72 ÷ 3. Complete the model. Explain what happens to the 1 ten that is remaining in the tens column.
4. Two friends share 56 dollars.
   a. They have 5 ten dollar bills and 6 dollar bills. Draw a picture to show how the bills will be shared.
      Will they have to make change at any stage?

   b. Explain how they share the money evenly.

5. Imagine you are filming a video explaining the problem 45 ÷ 3 to new fourth graders. Create a script to explain how you can keep dividing after getting a remainder of 1 ten in the first step.
1. Molly’s photo album has a total of 97 pictures. Each page of the album holds 6 pictures. How many pages can Molly fill? Will there be any pictures left? If so, how many? Use number disks to solve.

2. Marti’s photo album has a total of 45 pictures. Each page holds 4 pictures. She said she can only fill 10 pages completely. Do you agree? Explain why or why not.
Lesson 19 Homework

Name ____________________________________________ Date ______________________

1. When you divide 86 by 4 there is a remainder of 2. Model this problem with number disks. In the number disk model, how can you see that there is a remainder?

2. Francine says that 86 ÷ 4 is 20 with a remainder of 6. She reasons it is correct because (4 × 20) + 6 = 86. What mistake has Francine made? Explain how she can correct her work.

3. The number disk model is showing 67 ÷ 4. Complete the model. Explain what happens to the 2 tens that are remaining in the tens column.
4. Two friends share 76 blueberries.
   a. To count the blueberries, they have already put them into small bowls of 10. Draw a picture to show how the blueberries can be shared equally. Will they have to split apart any of the bowls of 10 blueberries when they share them?

   b. Explain how the friends can share the blueberries fairly.

5. Imagine you are drawing a comic strip showing how to solve the problem 72 ÷ 4 to new fourth graders. Create a script to explain how you can keep dividing after getting a remainder of 3 tens in the first step.
Lesson 20

Objective: Solve division problems without remainders using the area model.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (8 minutes)
- Concept Development (30 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Divide Using the Standard Algorithm 4.NBT.6 (4 minutes)
- Find the Unknown Factor 4.OA.4 (5 minutes)
- Mental Multiplication 4.NBT.5 (3 minutes)

Divide Using the Standard Algorithm (4 minutes)

Materials: (S) Personal white boards

Note: This drill reviews G4–M3–Lesson 17’s content.

Repeat the process from G4–M3–Lessons 17–19 using the following possible sequence: 67 ÷ 2, 60 ÷ 4, 29 ÷ 3, and 77 ÷ 4.

Find the Unknown Factor (5 minutes)

Materials: (S) Personal white boards

Note: This prepares students for G4–M3–Lesson 22’s Concept Development

  T: (Write 5 × ___ = 15.) Say the unknown factor.
  S: 3.
  T: (Write 15 ÷ 5.) On your boards, write the division problem.
  S: (Write 15 ÷ 5 = 3.)

Continue with the following possible suggestions: 3 × ___ = 12, 4 × ___ = 12, 5 × ___ = 35, 6 × ___ = 36, 7 × ___ = 49, 9 × ___ = 81, 6 × ___ = 48, 7 × ___ = 42, and 9 × ___ = 54.
1. Alfonso solved a division problem by drawing an area model.
   a. Look at the area model. What division problem did Alfonso solve?

   ![Area Model](image)

   b. Show a number bond to represent Alfonso’s area model. Start with the total and then show how the total is split into two parts. Below the two parts, represent the total length using the distributive property and then solve.

   ![Number Bond](image)

   

   \[
   (\_ \div \_) + (\_ \div \\_)
   \]

   \[
   = \_ + \_
   \]

   \[
   = \_
   \]

2. Solve 45 ÷ 3 using an area model. Draw a number bond and use the distributive property to solve for the unknown length.
3. Solve $64 \div 4$ using an area model. Draw a number bond to show how you partitioned the area, and represent the division with a written method.

4. Solve $92 \div 4$ using an area model. Explain, using words, pictures, or numbers, the connection of the distributive property to the area model.

5. Solve $72 \div 6$ using an area model and the standard algorithm.
1. Tony drew the following area model to find an unknown length. What division equation did he model?

```
   20  4
  3| 60 12
```

2. Solve $42 \div 3$ using the area model, a number bond, and a written method.
1. Maria solved the following division problem by drawing an area model.
   a. Look at the area model. What division problem did Maria solve?

   ![Area Model](image)

   b. Show a number bond to represent Maria’s area model. Start with the total and then show how the total is split into two parts. Below the two parts, represent the total length using the distributive property and then solve.

   ![Number Bond](image)

   \[
   \left( \frac{\text{\_\_\_}}{\text{\_\_\_}} \right) + \left( \frac{\text{\_\_\_}}{\text{\_\_\_}} \right) = \text{\_\_\_} + \text{\_\_\_} = \text{\_\_\_}
   \]

2. Solve \(42 \div 3\) using an area model. Draw a number bond and use the distributive property to solve for the unknown length.
3. Solve 60 ÷ 4 using an area model. Draw a number bond to show how you partitioned the area, and represent the division with a written method.

4. Solve 72 ÷ 4 using an area model. Explain, using words, pictures, or numbers, the connection of the distributive property to the area model.

5. Solve 96 ÷ 6 using an area model and the standard algorithm.
Lesson 21 Problem Set

Name ____________________________ Date ______________

1. Solve $37 \div 2$ using an area model. Use long division and the distributive property to record your work.

2. Solve $76 \div 3$ using an area model. Use long division and the distributive property to record your work.

3. Carolina solved the following division problem by drawing an area model.

   ![Area Model](image)

   a. What division problem did she solve?
   b. Show how Carolina’s model can be represented using the distributive property.
Solve the following problems using the area model. Support the area model with long division or the distributive property.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>$48 \div 3$</td>
</tr>
<tr>
<td>5.</td>
<td>$49 \div 3$</td>
</tr>
<tr>
<td>6.</td>
<td>$56 \div 4$</td>
</tr>
<tr>
<td>7.</td>
<td>$58 \div 4$</td>
</tr>
<tr>
<td>8.</td>
<td>$66 \div 5$</td>
</tr>
<tr>
<td>9.</td>
<td>$79 \div 3$</td>
</tr>
</tbody>
</table>

10. Seventy-three students are divided into groups of 6 students each. How many groups of 6 students are there? How many students will not be in a group of 6?
1. Kyle drew the following area model to find an unknown length. What division equation did he model?

2. Solve $93 \div 4$ using the area model, long division, and the distributive property.
Lesson 21 Homework

Name ____________________________ Date _________________

1. Solve $35 \div 2$ using an area model. Use long division and the distributive property to record your work.

2. Solve $79 \div 3$ using an area model. Use long division and the distributive property to record your work.

3. Paulina solved the following division problem by drawing an area model.

   ![Area Model](image)

   a. What division problem did she solve?
   
   b. Show how Paulina’s model can be represented using the distributive property.
Solve the following problems using the area model. Support the area model with long division or the distributive property.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>42 ÷ 3</td>
</tr>
<tr>
<td>5.</td>
<td>43 ÷ 3</td>
</tr>
<tr>
<td>6.</td>
<td>52 ÷ 4</td>
</tr>
<tr>
<td>7.</td>
<td>54 ÷ 4</td>
</tr>
<tr>
<td>8.</td>
<td>61 ÷ 5</td>
</tr>
<tr>
<td>9.</td>
<td>73 ÷ 3</td>
</tr>
</tbody>
</table>

10. Ninety-seven lunch trays were placed equally in 4 stacks. How many lunch trays were in each stack? How many lunch trays will be leftover?
1. Record the factors of the given numbers as multiplication sentences and as a list in order from least to greatest. Classify each as prime (P) or composite (C). The first problem is done for you.

<table>
<thead>
<tr>
<th>Multiplication Sentences</th>
<th>Factors</th>
<th>P or C</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 4</td>
<td>1 × 4 = 4  2 × 2 = 4</td>
<td>C</td>
</tr>
<tr>
<td>b. 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. 24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Find all factors for the following numbers and classify as prime or composite. Explain your classification of each as prime or composite.

<table>
<thead>
<tr>
<th>Factor Pairs for 25</th>
<th>Factor Pairs for 28</th>
<th>Factor Pairs for 29</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Bryan says all prime numbers are odd numbers.
   a. List all of the prime numbers less than 20 in numerical order.

   b. Use your list to show that Bryan’s claim is false.

4. Sheila has 28 stickers to divide evenly among 3 friends. She thinks there will be no leftovers. Use what you know about factor pairs to explain if Sheila is correct.
Record the factors of the given numbers as multiplication sentences and as a list in order from least to greatest. Classify each as prime (P) or composite (C).

<table>
<thead>
<tr>
<th>Multiplication Sentences</th>
<th>Factors</th>
<th>Prime (P) or Composite (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 9</td>
<td>The factors of 9 are:</td>
<td></td>
</tr>
<tr>
<td>b. 12</td>
<td>The factors of 12 are:</td>
<td></td>
</tr>
<tr>
<td>c. 19</td>
<td>The factors of 19 are:</td>
<td></td>
</tr>
</tbody>
</table>
1. Record the factors of the given numbers as multiplication sentences and as a list in order from least to greatest. Classify each as prime (P) or composite (C). The first problem is done for you.

<table>
<thead>
<tr>
<th>Multiplication Sentences</th>
<th>Factors</th>
<th>P or C</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (8) (1 \times 4 = 8) (2 \times 4 = 8)</td>
<td>The factors of 8 are: 1, 2, 4, and 8</td>
<td>C</td>
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<tr>
<td>b. (10)</td>
<td>The factors of 10 are:</td>
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<td>c. (11)</td>
<td>The factors of 11 are:</td>
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<td>d. (14)</td>
<td>The factors of 14 are:</td>
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<td>e. (17)</td>
<td>The factors of 17 are:</td>
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<td>f. (20)</td>
<td>The factors of 20 are:</td>
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<td>g. (22)</td>
<td>The factors of 22 are:</td>
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<td>h. (23)</td>
<td>The factors of 23 are:</td>
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<td>i. (25)</td>
<td>The factors of 25 are:</td>
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<td>j. (26)</td>
<td>The factors of 26 are:</td>
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<td>k. (27)</td>
<td>The factors of 27 are:</td>
<td></td>
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<tr>
<td>l. (28)</td>
<td>The factors of 28 are:</td>
<td></td>
</tr>
</tbody>
</table>
2. Find all factors for the following numbers and classify as prime or composite. Explain your classification of each as prime or composite.

<table>
<thead>
<tr>
<th>Factor Pairs for 19</th>
<th>Factor Pairs for 21</th>
<th>Factor Pairs for 24</th>
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</table>

3. Bryan says that only even numbers are composite.
   a. List all of the odd numbers less than 20 in numerical order.

   b. Use your list to show that Bryan’s claim is false.

4. Julie has 27 grapes to divide evenly among 3 friends. She thinks there will be no leftovers. Use what you know about factor pairs to explain if Julie is correct.
1. Explain your thinking or use division to answer the following.

   a. Is 2 a factor of 84?
   b. Is 2 a factor of 83?

   c. Is 3 a factor of 84?
   d. Is 2 a factor of 92?

   e. Is 6 a factor of 84?
   f. Is 4 a factor of 92?

   g. Is 5 a factor of 84?
   h. Is 8 a factor of 92?
2. Use the associative property to find more factors of 24 and 36.
   a. \[ 24 = 12 \times 2 \]
      \[ = (\, \_\, \times \, 3\,) \times 2 \]
      \[ = \, \_\, \times (3 \times 2) \]
      \[ = \, \_\, \times 6 \]
      \[ = \, \_\, \]
   b. \[ 36 = \, \_\, \times 4 \]
      \[ = (\, \_\, \times \, 3\,) \times 4 \]
      \[ = \, \_\, \times (3 \times 4) \]
      \[ = \, \_\, \times 12 \]
      \[ = \, \_\, \]

3. In class, we used the associative property to show that when 6 is a factor, then 2 and 3 are factors, because \( 6 = 2 \times 3 \). Use the fact that \( 8 = 4 \times 2 \) to show that 2 and 4 are factors of 56, 72, and 80.
   \[ 56 = 8 \times 7 \]
   \[ 72 = 8 \times 9 \]
   \[ 80 = 8 \times 10 \]

4. The first statement is false. The second statement is true. Explain why using words, pictures, or numbers.
   If a number has 2 and 4 as factors, then it has 8 as a factor.
   If a number has 8 as a factor, then both 2 and 4 are factors.
Lesson 23 Exit Ticket

1. Explain your thinking or use division to answer the following.

   a. Is 2 a factor of 34?

   b. Is 3 a factor of 34?

   c. Is 4 a factor of 72?

   d. Is 3 a factor of 72?

2. Use the associative property to explain why the following statement is true.

   Any number that has 9 as a factor also has 3 as a factor.
1. Explain your thinking or use division to answer the following.

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<tbody>
<tr>
<td>a.</td>
<td>Is 2 a factor of 72?</td>
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<tr>
<td>b.</td>
<td>Is 2 a factor of 73?</td>
</tr>
<tr>
<td>c.</td>
<td>Is 3 a factor of 72?</td>
</tr>
<tr>
<td>d.</td>
<td>Is 2 a factor of 60?</td>
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<td>e.</td>
<td>Is 6 a factor of 72?</td>
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<tr>
<td>f.</td>
<td>Is 4 a factor of 60?</td>
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<tr>
<td>g.</td>
<td>Is 5 a factor of 72?</td>
</tr>
<tr>
<td>h.</td>
<td>Is 8 a factor of 60?</td>
</tr>
</tbody>
</table>
2. Use the associative property to find more factors of 12 and 30.
   a. \[12 = 6 \times 2\]
      \[= (\_\_ \times 3) \times 2\]
      \[= \_\_ \times (3 \times 2)\]
      \[= \_\_ \times 6\]
      \[= \_\_\]
   b. \[30 = \_\_ \times 5\]
      \[= (\_\_ \times 3) \times 5\]
      \[= \_\_ \times (3 \times 5)\]
      \[= \_\_ \times 15\]
      \[= \_\_\]

3. In class, we used the associative property to show that when 6 is a factor, then 2 and 3 are factors, because \(6 = 2 \times 3\). Use the fact that \(10 = 5 \times 2\) to show that 2 and 5 are factors of 70, 80, and 90.
   \[
   \begin{align*}
   70 &= 10 \times 7 \\
   80 &= 10 \times 8 \\
   90 &= 10 \times 9
   \end{align*}
   \]

4. The first statement is false. The second statement is true. Explain why using words, pictures, or numbers.
   If a number has 2 and 6 as factors, then it has 12 as a factor.
   If a number has 12 as a factor, then both 2 and 6 are factors.
Lesson 24 Problem Set

1. For each of the following, time yourself for 1 minute. See how many multiples you can write.
   a. Write the multiples of 5 starting from 100.
   b. Write the multiples of 4 starting from 20.
   c. Write the multiples of 6 starting from 36.

2. List the numbers that have 24 as a multiple.

3. Use mental math, division, or the associate property to solve. (Use scratch paper if you like.)
   a. Is 12 a multiple of 4? ______ Is 4 a factor of 12? ______
   b. Is 42 a multiple of 8? ______ Is 8 a factor of 42? ______
   c. Is 84 a multiple of 6? ______ Is 6 a factor of 84? ______

4. Can a prime number be a multiple of any other number except itself? Explain your reasons why.
5. Follow the directions below.

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</table>

a. Circle in red the multiples of 2. When a number is a multiple of 2, what are the possible values for the ones digit?

b. Shade in green the multiples of 3. Choose one. What do you notice about the sum of the digits? Choose another. What do you notice about the sum of the digits?

c. Circle in blue the multiples of 5. When a number is a multiple of 5, what are the possible values for the ones digit?

d. Draw an X over the multiples of 10. What digit do all multiples of 10 have in common? What is the digit?
Name ____________________________  Date __________________

1. Fill in the unknown multiples of 11.
   
   \[5 \times 11 = \underline{\hspace{1cm}}\]
   
   \[6 \times 11 = \underline{\hspace{1cm}}\]
   
   \[7 \times 11 = \underline{\hspace{1cm}}\]
   
   \[8 \times 11 = \underline{\hspace{1cm}}\]
   
   \[9 \times 11 = \underline{\hspace{1cm}}\]

2. Complete the pattern of multiples by skip-counting.
   
   \[7, 14, \underline{\hspace{1cm}}, 28, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}\]

3. 
   
   a. List the numbers that have 18 as a multiple.

   b. What are the factors of 18?

   c. Are your two lists the same? Why or why not?
1. For each of the following, time yourself for 1 minute. See how many multiples you can write.
   a. Write the multiples of 5 starting from 75.
   b. Write the multiples of 4 starting from 40.
   c. Write the multiples of 6 starting from 24.

2. List the numbers that have 30 as a multiple.

3. Use mental math, division, or the associate property to solve. (Use scratch paper if you like.)
   a. Is 12 a multiple of 3? ______ Is 3 a factor of 12? ______
   b. Is 48 a multiple of 8? ______ Is 48 a factor of 8? ______
   c. Is 56 a multiple of 6? ______ Is 6 a factor of 56? ______

4. Can a prime number be a multiple of any other number except itself? Explain your reasons why.
5. Follow the directions below.

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a. Underline the multiples of 6. When a number is a multiple of 6, what are the possible values for the ones digit?

b. Draw a square around the multiples of 4. Look at the multiples of 4 that have an odd number in the tens place. What values do they have in the ones place?

c. Look at the multiples of 4 that have an even number in the tens place. What values do they have in the ones place? Do you think this pattern would continue with multiples of 4 that are larger than 100?

d. Circle the multiples of 9. Choose one. What do you notice about the sum of the digits? Choose another one. What do you notice about the sum of the digits?
Lesson 25 Problem Set

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 25: Explore properties of prime and composite numbers to 100 by using multiples.

Date: 8/28/13

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Name ________________________________ Date __________________

1. Follow the directions.

   Shade the number 1 red.

   a. Circle the first un-marked number.
   b. Cross off every multiple of that number except the one you circled. If it’s already crossed off, skip it.
   c. Repeat Steps (a) and (b) until every number is either circled or crossed off.
   d. Shade every crossed out number in orange.

   1 2 3 4 5 6 7 8 9 10

   11 12 13 14 15 16 17 18 19 20

   21 22 23 24 25 26 27 28 29 30

   31 32 33 34 35 36 37 38 39 40

   41 42 43 44 45 46 47 48 49 50

   51 52 53 54 55 56 57 58 59 60

   61 62 63 64 65 66 67 68 69 70

   71 72 73 74 75 76 77 78 79 80

   81 82 83 84 85 86 87 88 89 90

   91 92 93 94 95 96 97 98 99 100
2. List the circled numbers.

   a. Why weren’t the circled numbers crossed off along the way?

   b. Except for the number 1, what is similar about all of the numbers that were crossed off?

   c. What is similar about all of the numbers that were circled?
Lesson 25 Exit Ticket

Name ____________________________ Date ______________________

Use the calendar below to complete the following:

a. Cross off all composite numbers.

b. Circle all of the prime numbers.

c. List any remaining numbers.

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</table>
1. A student used the Sieve of Eratosthenes to find all prime numbers less than 100. Create a step-by-step set of directions to show how it was completed. Use the word bank to help guide your thinking as you write the directions. Some words may be used just once, more than once, or not at all.

Directions for completing the Sieve of Eratosthenes activity:

- Cross out multiples of each prime number starting from 2.
- Shade or mark the prime numbers.
- Circle any numbers that are neither crossed out nor shaded.
- Prime numbers are those that remain uncrossed.
- Composite numbers are those that have been crossed out or shaded.

Word Bank:
- cross out
- number
- shade
- circle
- X
- composite
- multiple
- prime
2. What do all of the numbers that are crossed out have in common?

3. What do all of the circled numbers have in common?

4. There is one number that is neither crossed out nor circled. Why is it treated differently?
Name __________________________________________________ Date ____________________

1. Draw number disks to represent the following problems. Rewrite each in unit form and solve.

a. \(6 \div 2 = \) ________
   \(6 \text{ ones } \div 2 = \) __________ ones

b. \(60 \div 2 = \) ________
   \(6 \text{ tens } \div 2 = \) ______________

c. \(600 \div 2 = \) ________
   \(6 \text{ hundreds } \div 2 = \) ______________

d. \(6,000 \div 2 = \) ________
   \(6 \text{ thousands } \div 2 = \) ______________

2. Draw number disks to represent each problem. Rewrite each in unit form and solve.

a. \(12 \div 3 = \) ________
   \(12 \text{ ones } \div 3 = \) __________ ones

b. \(120 \div 3 = \) ________
   \(12 \text{ tens } \div 3 = \) ______________

c. \(1,200 \div 3 = \) ________
   \(12 \text{ hundreds } \div 3 = \) ______________
3. Rewrite each in unit form. Solve for the quotient.

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</table>
| a. $800 \div 2 = 400$ | b. $600 \div 2$ | c. $800 \div 4$ | d. $900 \div 3$
| 8 hundreds ÷ 2 = 4 hundreds |   |   |   |

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</table>
| e. $300 \div 6$ | f. $240 \div 4$ | g. $450 \div 5$ | h. $200 \div 5$
| 30 tens ÷ 6 = ____ tens |   |   |   |

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</table>
| i. $3600 \div 4$ | j. $2400 \div 4$ | k. $2400 \div 3$ | l. $4000 \div 5$
| 36 hundreds ÷ 4 = ____ hundreds |   |   |   |

4. Some sand weighs 2,800 kilograms. It is divided equally between 4 trucks. How many kilograms of sand are in each truck?

5. Ivy has 5 times as many stickers as Adrian has. Ivy has 350 stickers. How many stickers does Adrian have?

6. An ice cream stand sold $1,600 worth of ice cream on Saturday, which was 4 times the amount sold on Friday. How much money did the ice cream stand collect on Friday?
Lesson 26 Exit Ticket

1. Rewrite each in unit form. Solve for the quotient.
   a. 600 ÷ 3 = 200  
      6 hundreds ÷ 3 = __ hundreds
   b. 1,200 ÷ 6
   c. 2,100 ÷ 7
   d. 3,200 ÷ 8

2. Hudson and 8 of his friends found a bag of pennies. There were 360 pennies which they shared equally. How many pennies did each person get?
1. Draw number disks to represent the following problems. Rewrite each in unit form and solve.
   
a. \(6 ÷ 3 = \) \_

   6 ones \( ÷ 3 = \) \_

   \(\text{1 1 1 1}\)

b. \(60 ÷ 3 = \) \_

   6 tens \( ÷ 3 = \) \_

c. \(600 ÷ 3 = \) \_

   \(\) \( ÷ 3 = \) \_

d. \(6,000 ÷ 3 = \) \_

   \(\) \( ÷ 3 = \) \_

2. Draw number disks to represent each problem. Rewrite each in unit form and solve.
   
a. \(12 ÷ 4 = \) \_

   12 ones \( ÷ 4 = \) \_

b. \(120 ÷ 4 = \) \_

   \(\) \( ÷ 4 = \) \_

c. \(1,200 ÷ 4 = \) \_

   \(\) \( ÷ 4 = \) \_
3. Rewrite each in unit form. Solve for the quotient.

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<td>b. 900 ÷ 3</td>
<td>c. 400 ÷ 2</td>
<td>d. 210 ÷ 3</td>
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<tr>
<td>8 hundreds ÷ 4 = 2 hundreds</td>
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<tr>
<td>e. 200 ÷ 4</td>
<td>f. 160 ÷ 2</td>
<td>g. 400 ÷ 5</td>
<td>h. 300 ÷ 5</td>
</tr>
<tr>
<td>20 tens ÷ 4 = ____ tens</td>
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</tr>
<tr>
<td>i. 1,200 ÷ 3</td>
<td>j. 1,600 ÷ 4</td>
<td>k. 2,400 ÷ 4</td>
<td>l. 3,000 ÷ 5</td>
</tr>
<tr>
<td>12 hundreds ÷ 3 = ____ hundreds</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. A fleet of five fire engines carries a total of 20,000 liters of water. If each truck holds the same amount of water, how many liters of water does each truck carry?

5. Jamie drank 4 times as much juice as Brodie. Jamie drank 280 mL of juice. How much juice did Brodie drink?

6. A diner sold $2,400 worth of French fries in June, which was 4 times as much as it sold in May. How many dollars’ worth of French fries were sold at the diner in May?
Lesson 27 Problem Set

Name ________________________________ Date ________________

1. Divide. Use number disks to model each problem.

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>a. $324 \div 2$</td>
<td>b. $344 \div 2$</td>
</tr>
<tr>
<td>c. $483 \div 3$</td>
<td>d. $549 \div 3$</td>
</tr>
</tbody>
</table>

Lesson 27: Represent and solve division problems with up to a three-digit dividend numerically and with number disks requiring decomposing a remainder in the hundreds place.

Date: 8/28/13

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2. Model using number disks and record using the algorithm.

<table>
<thead>
<tr>
<th></th>
<th>Number Disks</th>
<th>Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>655 ÷ 5</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>726 ÷ 3</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>688 ÷ 4</td>
<td></td>
</tr>
</tbody>
</table>
Divide. Use number disks to model each problem. Then solve using the algorithm.

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> $423 \div 3$</td>
<td>Number Disks</td>
<td>Algorithm</td>
</tr>
<tr>
<td><strong>2.</strong> $564 \div 4$</td>
<td>Number Disks</td>
<td>Algorithm</td>
</tr>
</tbody>
</table>
1. Divide. Use number disks to model each problem.

   a. \(346 \div 2\)  
   b. \(528 \div 2\)  
   c. \(516 \div 3\)  
   d. \(729 \div 3\)
2. Model using number disks and record using the algorithm.

<table>
<thead>
<tr>
<th></th>
<th>Number Disks</th>
<th>Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>648 ÷ 4</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>655 ÷ 5</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>964 ÷ 4</td>
<td></td>
</tr>
</tbody>
</table>
1. Divide. Check your work by multiplying. Draw disks on a place value chart as needed.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $574 \div 2$</td>
<td>b. $861 \div 3$</td>
</tr>
<tr>
<td>c. $354 \div 2$</td>
<td>d. $354 \div 3$</td>
</tr>
<tr>
<td>e. $873 \div 4$</td>
<td>f. $591 \div 5$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>g.</strong> 275 ÷ 3</td>
<td><strong>h.</strong> 459 ÷ 5</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>i.</strong> 678 ÷ 4</td>
<td><strong>j.</strong> 955 ÷ 4</td>
</tr>
</tbody>
</table>

2. Zach filled 581 one-liter bottles with apple cider. He distributed the bottles evenly to 4 stores. How many liter bottles did each of the stores receive? Were there any bottles left over? If so, how many?
1. Divide. Check your work by multiplying. Draw disks on a place value chart as needed.

   a. $776 \div 2$
   
   b. $596 \div 3$

2. A carton of milk contains 128 ounces. Sara’s son drinks 4 ounces of milk at each meal. How many 4-ounce servings will one carton of milk provide?
1. Divide. Check your work by multiplying. Draw disks on a place value chart as needed.

   a. \(378 \div 2\)  
   b. \(795 \div 3\)

   c. \(512 \div 4\)  
   d. \(492 \div 4\)

   e. \(539 \div 3\)  
   f. \(862 \div 5\)
2. Selena’s dog completed an obstacle course that was 932 meters long. There were 4 parts to the course, all equal in length. How long was 1 part of the course?

<table>
<thead>
<tr>
<th>g.  $498 \div 3$</th>
<th>h.  $783 \div 5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.  $621 \div 4$</td>
<td>j.  $531 \div 4$</td>
</tr>
</tbody>
</table>
1. Divide, then check using multiplication.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a. 1,672 ÷ 4</td>
<td>b. 1,578 ÷ 4</td>
</tr>
<tr>
<td>c. 6,948 ÷ 2</td>
<td>d. 8,949 ÷ 4</td>
</tr>
<tr>
<td>e. 7,569 ÷ 2</td>
<td>f. 7,569 ÷ 3</td>
</tr>
</tbody>
</table>
g. \(7,955 \div 5\)  

h. \(7,574 \div 5\)  

i. \(7,469 \div 3\)  

j. \(9,956 \div 4\)  

2. There are twice as many cows as goats on a farm. All the cows and goats have a total of 1,116 legs. How many goats are there?
Lesson 29 Exit Ticket

Name __________________________ Date __________________

1. Divide, then check using multiplication.

   a. \(1,770 \div 3\)  
   b. \(8,470 \div 5\)

2. The post office had an equal number of each of 4 types of stamps. There were a total of 1,784 stamps. How many of each type of stamp did the post office have?
1. Divide, then check using multiplication.

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>2,464 ÷ 4</td>
</tr>
<tr>
<td>b.</td>
<td>1,828 ÷ 3</td>
</tr>
<tr>
<td>c.</td>
<td>9,426 ÷ 3</td>
</tr>
<tr>
<td>d.</td>
<td>6,587 ÷ 2</td>
</tr>
<tr>
<td>e.</td>
<td>5,425 ÷ 3</td>
</tr>
<tr>
<td>f.</td>
<td>5,425 ÷ 2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>g.</td>
<td>8,427 ÷ 3</td>
</tr>
<tr>
<td>h.</td>
<td>8,426 ÷ 3</td>
</tr>
<tr>
<td>i.</td>
<td>4,937 ÷ 4</td>
</tr>
<tr>
<td>j.</td>
<td>6,173 ÷ 5</td>
</tr>
</tbody>
</table>

2. A truck has four crates of apples. Each crate has an equal number of apples. Altogether, the truck is carrying 1,728 apples. How many apples are in three crates?
Lesson 30 Problem Set

Name ________________________________ Date ______________________

Divide. Check your solutions by multiplying.

1. \(204 \div 4\)  
2. \(704 \div 3\)  

3. \(627 \div 3\)  
4. \(407 \div 2\)  

5. \(760 \div 4\)  
6. \(5,120 \div 4\)
7. \(3,070 \div 5\)  
8. \(6,706 \div 5\)

9. \(8,313 \div 4\)  
10. \(9,008 \div 3\)

11. 
   a. Find the quotient and remainder for \(3,131 \div 3\).
   
   b. How could you change the digit in the ones place of the whole so that there would be no remainder? Explain how you determined your answer.
Lesson 30 Exit Ticket

Name ___________________________ Date ______________________

Divide. Check your solutions by multiplying.

1. 380 ÷ 4

2. 7,040 ÷ 3
Divide. Check your solutions by multiplying.

1. \(409 \div 5\)
2. \(503 \div 2\)
3. \(831 \div 4\)
4. \(602 \div 3\)
5. \(720 \div 3\)
6. \(6,250 \div 5\)
Lesson 30 Homework

7. $2,060 \div 5$

8. $9,031 \div 2$

9. $6,218 \div 4$

10. $8,000 \div 4$

Solve division problems with a zero in the dividend or with a zero in the quotient.
1. Monique needs exactly 4 plates on each table for the banquet. If she has 312 plates, how many tables is she able to prepare?

\[ \begin{array}{c|c}
\text{312} & \ldots?\ldots \\
\hline
4 & \ldots?
\end{array} \]

2. 2,365 books were donated to an elementary school. If 5 classrooms shared the books equally, how many books did each class receive?

\[ \begin{array}{c|c|c|c|c}
\text{2,365} & \ldots?\ldots \\
\hline
\end{array} \]

3. If 1,503 kilograms of rice was packed in sacks weighing 3 kilograms each, how many sacks were packed?
4. Rita made 5 batches of cookies. There were a total of 2,400 cookies. If there were the same number of cookies in each batch, how many cookies were in 4 batches?

5. Every day, Sarah drives the same distance to work and back home. If Sarah drove 1,008 miles in 5 days, how far did Sarah drive in 3 days?
Lesson 31 Exit Ticket

Name _____________________________ Date __________________

Solve the following problems. Draw tape diagrams to help you solve. Identify if the group size or the number of groups is unknown.

1. 572 cars were parked in a parking garage. The same number of cars parked on each floor. If there were 4 floors, how many cars were parked on each floor?

2. 356 kg of flour were packed into sacks holding 2 kg each. How many sacks were packed?
Solve the following problems. Draw tape diagrams to help you solve. Identify if the group size or the number of groups is unknown.

1. 500 mL of juice was shared equally by 4 children. How much juice did each child get?

2. Kelly separated 618 cookies into baggies. Each baggie contained 3 cookies. How many baggies of cookies did Kelly make?

3. Jeff biked the same distance each day for 5 days. If he travelled 350 miles altogether, how many miles did he travel each day?
4. A piece of ribbon 876 inches long was cut by a machine into 4-inch long strips to be made into bows. How many strips were cut?

5. Five Martians equally share 1,940 Groblarx fruits. How many Groblarx fruits will 3 of the Martians receive?
Lesson 32 Problem Set

Solve the following problems. Draw tape diagrams to help you solve. If there is a remainder, shade in a small portion of the tape diagram to represent that portion of the whole.

1. A concert hall contains 8 sections of seats with the same number of seats in each section. If there are 248 seats, how many seats are in each section?

2. In one day, the bakery made 719 bagels. The bagels were divided into 9 equal shipments. A few bagels were left over and given to the baker. How many bagels did the baker get?

3. The sweet shop has 614 pieces of candy. They packed the candy into bags with 7 pieces in each bag. How many bags of candy did they fill? How many pieces of candy were left?
4. There were 904 children signed up for the relay race. If there were 6 children on each team, how many teams were made? The remaining children served as referees. How many children served as referees?

5. 1,188 kilograms of rice are divided into 7 sacks. How many kilograms of rice are in 6 sacks of rice? How many kilograms of rice remain?
Lesson 3 Exit Ticket

Solve the following problems. Draw tape diagrams to help you solve. If there is a remainder, shade in a small portion of the tape diagram to represent that portion of the whole.

1. Mr. Foote needs exactly 6 folders for each fourth grade student at Hoover Elementary School. If he bought 726 folders, how many students can he supply folders to?

2. Mrs. Terrance has a large bin of 236 crayons. He divides them equally among four containers. How many crayons does Mrs. Terrance have in each container?
Lesson 32 Homework

Name ____________________________ Date ____________________

Solve the following problems. Draw tape diagrams to help you solve. If there is a remainder, shade in a small portion of the tape diagram to represent that portion of the whole.

1. Meneca bought a package of 435 party favors to give to the guests at her birthday party. She calculated that she could give 9 party favors to each guest. How many guests is she expecting?

2. 4,000 pencils were donated to an elementary school. If 8 classrooms shared the pencils equally, how many pencils did each class receive?

3. 2,008 kilograms of potatoes were packed into sacks weighing 8 kilograms each. How many sacks were packed?
4. A baker made 7 batches of muffins. There were a total of 252 muffins. If there were the same number of muffins in each batch, how many muffins were in a batch?

5. Samantha ran 3,003 meters in 7 days. If she ran the same distance each day, how far did Samantha run in 3 days?
1. Ursula solved the following division problem by drawing an area model.

![Area Model Diagram]

   a. What division problem did she solve?

   b. Show a number bond to represent Ursula’s area model and represent the total length using the distributive property.

2. a. Solve $960 \div 4$ using the area model. There is no remainder in this problem.

   b. Draw a number bond and use the long division algorithm to record your work from (a).
3. a. Draw an area model to solve $774 \div 3$.

   b. Draw a number bond to represent this problem.

   c. Record your work using the long division algorithm.

4. a. Draw an area model to solve $1,584 \div 2$.

   b. Draw a number bond to represent this problem.

   c. Record your work using the long division algorithm.
Lesson 33 Exit Ticket

Name ____________________________ Date _________________

1. Anna solved the following division problem by drawing an area model.

   ![Area Model Diagram]

   a. What division problem did she solve?

   b. Show a number bond to represent Anna’s area model and represent the total length using the distributive property.

2. a. Draw an area model to solve 1,368 ÷ 2.

   ![Area Model Diagram]

   b. Draw a number bond to represent this problem.

   c. Record your work using the long division algorithm.
1. Arabelle solved the following division problem by drawing an area model.

   ![Area Model Diagram]

   a. What division problem did she solve?

   b. Show a number bond to represent Arabelle’s area model and represent the total length using the distributive property.

2. a. Solve $816 ÷ 4$ using the area model. There is no remainder in this problem.

   b. Draw a number bond and use a written method to record your work from (a).
3.  a. Draw an area model to solve $549 \div 3$.

   b. Draw a number bond to represent this problem.

   c. Record your work using the long division algorithm.

4.  a. Draw an area model to solve $2,762 \div 2$.

   b. Draw a number bond to represent this problem.

   c. Record your work using the long division algorithm.
Lesson 34 Problem Set

1. Use the associative property to rewrite each expression. Solve using disks and then complete the number sentences.

   a. $30 \times 24$
      
      \[
      = (\ ____ \times 10) \times 24 \\
      = \ ____ \times (10 \times 24) \\
      = \ ______
      \]

   b. $40 \times 43$
      
      \[
      = (4 \times 10) \times \ ____ \\
      = 4 \times (10 \times \ ____ ) \\
      = \ ______
      \]

   c. $30 \times 37$
      
      \[
      = (3 \times \ ____ ) \times \ ____ \\
      = 3 \times (10 \times \ ____ ) \\
      = \ ______
      \]
2. Use the associative property and number disks to solve.
   
a. \(20 \times 27\)

   b. \(40 \times 31\)

3. Use the associative property without number disks to solve.
   
a. \(40 \times 34\)

   b. \(50 \times 43\)

4. Use the distributive property to solve the following problems. Distribute the second factor.
   
a. \(40 \times 34\)

   b. \(60 \times 25\)
Lesson 34 Exit Ticket

Name _____________________________________________ Date ______________

1. Use the associative property to rewrite each expression. Solve using disks and then complete the number sentences.

   a. \(20 \times 41 = \)

      \(\_\_\_ \times \_\_\_ \times \_\_\_ = \)

<table>
<thead>
<tr>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Distribute 32 as 30 + 2 and solve.

   \(60 \times 32\)
Lesson 34 Homework

1. Use the associative property to rewrite each expression. Solve using disks and then complete the number sentences.

   a. \[20 \times 34\]
      
      \[= (\____ \times 10) \times 34\]
      
      \[= \____ \times (10 \times 34)\]
      
      \[= \______\]

   b. \[30 \times 34\]
      
      \[= (3 \times 10) \times \____\]
      
      \[= 3 \times (10 \times \___)\]
      
      \[= \______\]

   c. \[30 \times 42\]
      
      \[= (3 \times \___) \times \____\]
      
      \[= 3 \times (10 \times \____)\]
      
      \[= \______\]
2. Use the associative property and number disks to solve.
   a. \(20 \times 16\)
   b. \(40 \times 32\)

3. Use the associative property without number disks to solve.
   a. \(30 \times 21\)
   b. \(60 \times 42\)

4. Use the distributive property to solve the following. Distribute the second factor.
   a. \(40 \times 43\)
   b. \(70 \times 23\)
Lesson 35 Problem Set

Name __________________________ Date ________________

Use an area model to represent the following expressions. Then record the partial products and solve.

1. 20 × 22

\[
\begin{array}{c|c}
22 & 20 \\
\hline
 & \\
\hline
 & \\
\end{array}
\]

\[22 \times 20 = \\
+ \\
\]

2. 50 × 41

\[
\begin{array}{c|c}
41 & 50 \\
\hline
 & \\
\hline
 & \\
\end{array}
\]

\[41 \times 50 = \\
+ \\
\]

3. 60 × 73

\[
\begin{array}{c|c}
73 & 60 \\
\hline
 & \\
\hline
 & \\
\end{array}
\]

\[73 \times 60 = \\
+ \\
\]
Draw an area model to represent the following expressions. Then record the partial products vertically and solve.

4. $80 \times 32$

5. $70 \times 54$

Visualize the area model and solve the following products numerically.

6. $30 \times 68$

7. $60 \times 34$

8. $40 \times 55$

9. $80 \times 55$
Use an area model to represent the following expressions. Then record the partial products and solve.

1. \(30 \times 93\)

```
\[\begin{array}{c}
93 \\
\times 30 \\
\hline
\end{array}\]
```

\[+\]

2. \(40 \times 76\)

```
\[\begin{array}{c}
76 \\
\times 40 \\
\hline
\end{array}\]
```

\[+\]
Use an area model to represent the following expressions. Then record the partial products and solve.

1. $30 \times 17$

   
   
   
   

2. $40 \times 58$

   
   
   
   

3. $50 \times 38$

   
   
   
   

Lesson 35: Multiply two-digit multiples of 10 by two-digit numbers using the area model.

Date: 8/28/13

Draw an area model to represent the following expressions. Then record the partial products vertically and solve.

4. $60 \times 19$

5. $20 \times 44$

Visualize the area model and solve the following products numerically.

6. $20 \times 88$

7. $30 \times 88$

8. $70 \times 47$

9. $80 \times 65$
1. In each of the two models pictured below, write the expressions that determine the area of each of the four smaller rectangles.

\[
\begin{array}{c}
\text{Model 1} \\
\end{array}
\]  
\[
\begin{array}{c}
\text{Model 2} \\
\end{array}
\]

b. Using the distributive property, rewrite the area of the large rectangle as the sum of the areas of the four smaller rectangles. Express first in number form and then read in unit form.

\[
14 \times 12 = (4 \times \_\_\_\_) + (4 \times \_\_\_\_) + (10 \times \_\_\_\_) + (10 \times \_\_\_\_) 
\]

2. Use an area model to represent the following expressions. Record the partial products and solve.

a. \(14 \times 22\)

\[
\begin{array}{c}
\text{Area Model} \\
\end{array}
\]
Draw an area model to represent the following expressions. Record the partial products vertically and solve.

3. \(25 \times 32\)

4. \(35 \times 42\)

Visualize the area model and solve the following numerically using four partial products. (You may sketch an area model if it helps.)

5. \(42 \times 11\)

6. \(46 \times 11\)
Lesson 36 Exit Ticket

Name _______________________________ Date _____________________

Record the partial products to solve.

Draw an area model first to support your work, or draw the area model last to check your work.

1. 26 × 43

2. 17 × 55
Lesson 36 Homework

1. a. In each of the two models pictured below, write the expressions that determine the area of each of the four smaller rectangles.

![Area Model 1](image1)

![Area Model 2](image2)

b. Using the distributive property, rewrite the area of the large rectangle as the sum of the areas of the four smaller rectangles. Express first in number form and then read in unit form.

\[ 13 \times 12 = (3 \times \underline{\_\_\_\_}) + (3 \times \underline{\_\_\_\_}) + (10 \times \underline{\_\_\_\_}) + (10 \times \underline{\_\_\_\_}) \]

2. Use an area model to represent the following expressions. Record the partial products and solve.

\[ 17 \times 34 \]

3 4
\[
\times 1 7
\]

[Blank area model]
Draw an area model to represent the following expressions. Record the partial products vertically and solve.

3. 45 × 18

4. 45 × 19

Visualize the area model and solve the following numerically using four partial products. (You may sketch an area model if it helps.)

5. 12 × 47

6. 23 × 93

7. 23 × 11

8. 23 × 22
Name ________________________________ Date ____________

1. Solve $14 \times 12$ using 4 partial products and 2 partial products. Remember to think in terms of units as you solve. Write an expression to find the area of each smaller rectangle in the area model.

$$
\begin{array}{c}
12 \\
\times 14 \\
\hline \\
4 \text{ ones} \times 2 \text{ ones} \\
4 \text{ ones} \times 1 \text{ ten} \\
1 \text{ ten} \times 2 \text{ ones} \\
1 \text{ ten} \times 1 \text{ ten} \\
\end{array}
$$

2. Solve $32 \times 43$ using 4 partial products and 2 partial products. Match each partial product to its area on the models. Remember to think in terms of units as you solve.

$$
\begin{array}{c}
43 \\
\times 32 \\
\hline \\
2 \text{ ones} \times 3 \text{ ones} \\
2 \text{ ones} \times 4 \text{ tens} \\
3 \text{ tens} \times 3 \text{ ones} \\
3 \text{ tens} \times 4 \text{ tens} \\
\end{array}
$$
3. Solve $57 \times 15$ using 2 partial products. Match each partial product to its rectangle on the area model.

4. Solve the following using 2 partial products. Visualize the area model to help you.

a. \[ \begin{array}{c}
5 \\
\times \\
46
\end{array} \]

b. \[ \begin{array}{c}
18 \\
\times \\
62
\end{array} \]

c. \[ \begin{array}{c}
39 \\
\times \\
46
\end{array} \]

d. \[ \begin{array}{c}
78 \\
\times \\
23
\end{array} \]
Name _____________________________ Date ____________

1. Solve $43 \times 22$ using 4 partial products and 2 partial products. Remember to think in terms of units as you solve. Write an expression to find the area of each smaller rectangle in the area model.

2. Solve the following using 2 partial products.

$$
\begin{array}{c}
64 \\
\times 15
\end{array}

\begin{array}{c}
5 \text{ ones } \times 64 \text{ ones} \\
1 \text{ ten } \times 64 \text{ ones}
\end{array}$$
Lesson 37: Transition from four partial products to the standard algorithm for two-digit by two-digit multiplication.

Date: 8/28/13

1. Solve $26 \times 34$ using 4 partial products and 2 partial products. Remember to think in terms of units as you solve. Write an expression to find the area of each smaller rectangle in the area model.

\[
\begin{array}{c}
\text{34} \\
\times \ 26
\end{array}
\]

- $6$ ones $\times$ 4 ones
- $6$ ones $\times$ 3 tens
- $2$ tens $\times$ 4 ones
- $2$ tens $\times$ 3 tens

2. Solve using 4 partial products and 2 partial products. Remember to think in terms of units as you solve. Write an expression to find the area of each smaller rectangle in the area model.

\[
\begin{array}{c}
\text{41} \\
\times \ 82
\end{array}
\]

- $2$ ones $\times$ 1 one
- $2$ ones $\times$ 4 tens
- $8$ tens $\times$ 1 one
- $8$ tens $\times$ 4 tens
3. Solve $52 \times 26$ using 2 partial products and an area model. Match each partial product to its area on the model.

4. Solve the following using 2 partial products. Visualize the area model to help you.

a. $68 \times 23$

b. $49 \times 33$

c. $16 \times 25$

d. $54 \times 71$
1. Express $23 \times 54$ as two partial products using the distributive property. Solve.

$$23 \times 54 = (\_\_ \text{ fifty-fours}) + (\_\_ \text{ fifty-fours})$$

2. Express $46 \times 54$ as two partial products using the distributive property. Solve.

$$46 \times 54 = (\_\_ \text{ fifty-fours}) + (\_\_ \text{ fifty-fours})$$

3. Express $55 \times 47$ using two partial products using the distributive property. Solve.

$$55 \times 47 = (\_\_ \times \_\_) + (\_\_ \times \_\_)$$
4. Solve the following using 2 partial products.

\[
\begin{array}{c}
58 \\
\times 45 \\
\hline \\
\end{array}
\]

5. Solve using the multiplication algorithm.

\[
\begin{array}{c}
82 \\
\times 55 \\
\hline \\
\end{array}
\]

6. \(53 \times 63\)  
7. \(84 \times 73\)
Name __________________________________________ Date ___________________

Solve using the multiplication algorithm.

1. 

7 2
× 4 3
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____ × ___

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____ × ___

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2. 35 × 53
Lesson 38: Transition from four partial products to the standard algorithm for two-digit by two-digit multiplication.

Date: 8/28/13

1. Express $26 \times 43$ as two partial products using the distributive property. Solve.

$$26 \times 43 = (\_\_\_\_\_\_\_\text{forty-threes}) + (\_\_\_\_\_\_\_\text{forty-threes})$$

$$\begin{array}{c}
\times 26 \\
\hline
\hline
\hline
\hline
\hline
\end{array}$$

2. Express $47 \times 63$ as two partial products using the distributive property. Solve.

$$47 \times 63 = (\_\_\_\_\_\_\_\text{sixty-threes}) + (\_\_\_\_\_\_\_\text{sixty-threes})$$

$$\begin{array}{c}
\times 47 \\
\hline
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\hline
\end{array}$$

3. Express $54 \times 67$ as two partial products using the distributive property. Solve.

$$54 \times 67 = (\_\_\_\_\_\_\_\times \_\_\_\_\_\_\_\_\_) + (\_\_\_\_\_\_\_\times \_\_\_\_\_\_\_\_\_)$$
Solve the following using 2 partial products.

4.

\[
\begin{array}{c}
5 2 \\
\times 3 4 \\
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1. Draw an area model to solve the following. Find the value of the following expressions.
   a. \(30 \times 60\)  
   b. \(3 \times 269\)

2. Use any place value strategy to multiply.
   a. \(3 \times 68\)  
   b. \(4 \times 371\)
   c. \(7 \times 1,305\)  
   d. \(6,034 \times 5\)
Solve using a model or equation. Show your work and write your answer as a statement.

3. A movie theater has two rooms. Room A has 9 rows of seats with 18 seats in each row. Room B has three times as many seats as Room A. How many seats are there in both rooms?

4. The high school art teacher has 9 cases of crayons with 52 boxes in each case. The elementary school art teacher has 6 cases of crayons with 104 boxes in each case. How many total boxes of crayons do both teachers have? Is your answer reasonable? Explain.
5. Last year Mr. Petersen’s rectangular garden had a width of 5 meters and an area of 20 square meters. This year he wants to make the garden three times as long and two times as wide.

a. Solve for the length of last year’s garden using the area formula. Then, draw and label the measurements of this year’s garden.

<table>
<thead>
<tr>
<th>Last Year</th>
<th>This Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 m</td>
<td>_____ m</td>
</tr>
<tr>
<td>20 square meters</td>
<td>_____ m</td>
</tr>
</tbody>
</table>

b. How much area for planting will Mr. Petersen have in the new garden?
c. Last year, Mr. Petersen had a fence all the way around his garden. He can reuse all of the fence he had around the garden last year, but he needs to buy more fencing to go around this year’s garden. How many more meters of fencing is needed for this year’s garden than last year’s?

d. Last year Mr. Petersen was able to plant 4 rows of carrots with 13 plants in each row. This year he plans to plant twice as many rows with twice as many carrot plants in each. How many carrot plants will he plant this year? Write a multiplication equation to solve. Assess the reasonableness of your answer.
Name ____________________________ Date ________________

1. What is the greatest multiple of 7 that is less than 60?

2. Identify each number as prime or composite. Then list all of its factors.
   a. 3 ____________________________
      ______________________________________
   b. 6 ____________________________
      ______________________________________
   c. 15 ____________________________
      ______________________________________
   d. 24 ____________________________
      ______________________________________
   e. 29 ____________________________
      ______________________________________

3. Use any place value strategy to divide.
   a. 3,600 ÷ 9
   b. 96 pencils come in a box. If 4 teachers share 3 boxes equally, how many pencils does each teacher receive?
4. 427 ÷ 3
   a. Solve by drawing number disks:  
   b. Solve numerically:

5. Use any place value strategy to multiply or divide.
   a. 5,316 ÷ 3  
   b. 3,809 ÷ 5
   c. 29 × 56  
   d. 17 × 43
Solve using a model or equation. Show your work and write your answer as a statement.

6. A new grocery store is opening next week.
   a. The store’s rectangular floor is 42 meters long and 39 meters wide. How many square meters of flooring do they need? Use estimation to assess the reasonableness of your answer.

   b. The store ordered small posters and large posters to promote their opening. Twelve times as many small posters were ordered as large posters. If there were 48 large posters, how many more small posters were ordered than large posters?
c. Uniforms are sold in packages of 8. The store’s 127 employees will each be given 3 uniforms. How many packages will the store need to order?

d. There are 3 numbers for the combination to the store’s safe. The first number is 17. The other 2 numbers can be multiplied together to give a product of 28. What are all of the possibilities? Write your answers as a multiplication equation.
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