GRADE 3 • MODULE 3
Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10

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Lesson 1 Problem Set

Name ____________________________ Date __________________

1. a. Solve. Shade in the multiplication facts for sixes, sevens, eights, and nines that you already know.

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Complete the chart. Each bag contains 7 apples.

<table>
<thead>
<tr>
<th>Number of bags</th>
<th>2</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of apples</td>
<td>21</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

2. Use the array to write two different multiplication sentences.

_____ = _____ × _____

_____ = _____ × _____
Lesson 1 Problem Set

3. Complete the equations.

a. 2 sevens = ________ twos
   = 14

b. 3 ________ = 6 threes
   = ________

c. 10 eights = 8________
   = ________

d. 4 × ________ = 6 × 4
   = ________

e. 8 × 5 = ________ × 8
   = ________

f. ________ × 7 = 7 × ________
   = 28

g. 3 × 9 = 10 threes – ________ three
   = ________

h. 10 fours – 1 four = ________ × 4
   = ________

i. 8 × 4 = 5 fours + ________ fours
   = ________

j. ________ fives + 1 five = 6 × 5
   = ________

k. 5 threes + 2 threes = ________ × ________
   = ________

l. ________ twos + ________ twos = 10 twos
   = ________
1. Use the array to write two different multiplication facts.

\[ \square = \square \times \square \]
\[ \square = \square \times \square \]

2. Karen says, “If I know \(3 \times 8 = 24\), then I know the answer to \(8 \times 3\)!” Explain how this is true.
Lesson 1 Homework

Name ___________________________ Date ________________

1. Complete the charts below.

a. A tricycle has 3 wheels.

<table>
<thead>
<tr>
<th>Number of tricycles</th>
<th>3</th>
<th>5</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of wheels</td>
<td>12</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

b. A tiger has 4 legs.

<table>
<thead>
<tr>
<th>Number of tigers</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of legs</td>
<td>20</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

c. A pack has 5 erasers.

<table>
<thead>
<tr>
<th>Number of packs</th>
<th>6</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of erasers</td>
<td>35</td>
<td>40</td>
</tr>
</tbody>
</table>

2. Write two multiplication facts for each array.

\[ \_ \times \_ = \_ \]
\[ \_ \times \_ = \_ \]
3. Match the expressions.

- $3 \times 6$  
  - 7 threes

- 3 sevens 
  - $2 \times 10$

- 2 eights
  - $9 \times 5$

- $5 \times 9$
  - $8 \times 2$

- 10 twos
  - $6 \times 3$

4. Complete the equations.

a. 2 sixes = _____ twos 
   = 12

d. $4 \times$ _____ = _____ $\times 4$ 
   = 28

b. _____ $\times 6 = 6$ threes 
   = ______

e. 5 twos $+ 2$ twos = _____ $\times$ _____ 
   = ______

c. $4 \times 8$ = _____ $\times 4$ 
   = ______
f. _____ fives $+ 1$ five $= 6 \times 5$ 
   = ______
Lesson 2 Problem Set

Name ________________________________ Date __________________

1. Each block has a value of 7.

Unit form: 5 ________

Facts: 5 × _____ = _____ × 5

Total = ______

Unit form: 6 sevens = ______ sevens + ______ seven

= 35 + ______

= ______

Facts: _____ × ______ = ______

_____ × ______ = ______
2. a. Each dot has a value of 8.

Unit form: 5 _____________

Facts: 5 × _____ = _____ × 5

Total: = _____

b. Use the fact above to find 8 × 6. Show your work using pictures, numbers, or words.
Lesson 2 Limit Set

3. An author writes 9 pages of her book each week. How many pages does she write in 7 weeks?
   Use a fives fact to solve.

4. Mrs. Gonzalez buys a total of 32 crayons for her classroom. Each pack contains 8 crayons. How many packs of crayons does Mrs. Gonzalez buy?

5. Hannah has $500. She buys a camera for $435 and 4 other items for $9 each. Now Hannah wants to buy speakers for $50. Does she have enough money to buy the speakers? Explain.
Use a fives fact to help you solve $7 \times 6$. Show your work using pictures, numbers, or words.
Lesson 2 Homework

1. Each has a value of 9.

Unit form: ______________________

Facts: $5 \times \underline{\space} = \underline{\space} \times 5$

Total = ______

Unit form: 6 nines = _____ nines + _____ nine

= 45 + _____

= ______

Facts: _____ $\times$ _____ = ______

_____ $\times$ _____ = ______

Name ____________________________ Date ______________

Lesson 2: Apply the distributive and commutative properties to relate multiplication facts $5 \times n + n$ to $6 \times n$ and $n \times 6$ where $n$ is the size of the unit.

Date:

7/31/13

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Lesson 2 Homework

2. There are 6 blades on each windmill. How many total blades are on 7 windmills? Use a fives fact to solve.

3. Juanita organizes her magazines into 3 equal piles. She has a total of 18 magazines. How many magazines are in each pile?

4. Markuo spends $27 on some plants. Each plant costs $9. How many plants does he buy?
Lesson 3 Problem Set

Name _______________________________ Date ______________________

1. Each equation contains a letter representing the unknown. Find the value of the unknowns, then write the letters that match the answers to solve the riddle.

\[\begin{align*}
5 \times 4 &= e \\
\text{e} &= \underline{\hspace{2cm}} \\
\text{e} = \underline{\hspace{2cm}} \\
24 \div i &= 4 \\
\text{i} &= \underline{\hspace{2cm}} \\
21 \div 3 &= l \\
\text{l} &= \underline{\hspace{2cm}} \\
32 &= s \times 8 \\
\text{s} &= \underline{\hspace{2cm}} \\
21 &= c \times 7 \\
\text{c} &= \underline{\hspace{2cm}} \\
8 &= 80 \div n \\
\text{n} &= \underline{\hspace{2cm}} \\
8 &= a \div 3 \\
\text{a} &= \underline{\hspace{2cm}} \\
4 &= 36 \div k \\
\text{k} &= \underline{\hspace{2cm}} \\
24 \div b &= 12 \\
\text{b} &= \underline{\hspace{2cm}} \\
5 \times 4 &= e \\
24 \div i &= 4 \\
8 &= 80 \div n \\
35 &= 7 \times h \\
\end{align*}\]

Which tables do you NOT have to learn?

<table>
<thead>
<tr>
<th>9</th>
<th>6</th>
<th>70</th>
<th>3</th>
<th>5</th>
<th>20</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>24</td>
<td>2</td>
<td>7</td>
<td>20</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
2. Lonna buys 3 t-shirts for $8 each.
   
a. What is the total amount Lonna spends on 3 t-shirts? Use the letter $m$ to represent the total amount Lonna spends, and then solve the problem.

b. If Lonna hands the cashier 3 ten dollar bills, how much change will she receive? Use the letter $c$ to represent the change in an equation, and then find the value of $c$.

3. Miss Potts used a total of 28 cups of flour to bake some bread. She put 4 cups of flour in each pan. How many pans of bread did she bake? Represent the problem using multiplication and division sentences and a letter for the unknown. Then, solve the problem.

   _____ × _____ = ______
   _____ ÷ _____ = ______

4. At a table tennis tournament, two games went on for a total of 32 minutes. One game took 12 minutes longer than the other. How long did it take to complete each game? Use letters to represent the unknowns. Solve the problem.
Name ___________________________ Date ______________

Find the value of the unknown in Problems 1–4.

1. \(z = 5 \times 9\)
   \(z = _____\)

2. \(30 \div 6 = v\)
   \(v = _____\)

3. \(8 \times w = 24\)
   \(w = _____\)

4. \(y \div 4 = 7\)
   \(y = _____\)

5. Mr. Strand waters his rose bushes for a total of 15 minutes. He waters each rose bush for 3 minutes. How many rose bushes does Mr. Strand water? Represent the problem using multiplication and division sentences and a letter for the unknown. Then, solve the problem.

   _____ \(\times_____ = _____\)

   _____ \(\div _____ = _____\)
Name ________________________________  Date ________________

1.  a.  Complete the pattern.

\[ 30 \quad 60 \quad 90 \]

b.  Find the value of the unknown.

\[
\begin{align*}
10 \times 2 &= d & d &= 20 \\
3 \times 10 &= e & e &= 30 \\
f &= 4 \times 10 & f &= 40 \\
p &= 5 \times 10 & p &= 50 \\
10 \times 6 &= w & w &= 60 \\
10 \times 7 &= n & n &= 70 \\
g &= 8 \times 10 & g &= 80 \\
3 \times 10 &= e & e &= 30 \\
p \times 8 &= 40 & p &= 5
\end{align*}
\]

2.  Each equation contains a letter representing the unknown.  Find the value of the unknown.

\[
\begin{array}{|c|c|c|}
\hline
8 \div 2 &= n & n &= 4 \\
3 \times a &= 12 & a &= 4 \\
p \times 8 &= 40 & p &= 5 \\
18 \div 6 &= c & c &= 3 \\
d \times 4 &= 24 & d &= 6 \\
h \div 7 &= 5 & h &= 35 \\
6 \times 3 &= f & f &= 18 \\
32 \div y &= 4 & y &= 8 \\
\hline
\end{array}
\]

Multiplying and dividing with familiar facts using a letter to represent the unknown.

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3. Pedro buys 4 books at the fair for $7 each.
   a. What is the total amount Pedro spends on 4 books? Use the letter \( b \) to represent the total amount Pedro spends, and then solve the problem.

   b. Pedro hands the cashier 3 ten dollar bills. How much change will he receive? Write an equation to solve. Use the letter \( c \) to represent the unknown.

4. On field day, the first grade dash is 25 meters long. The third grade dash is twice the distance of the first grade dash. How long is the third grade dash? Use a letter to represent the unknown and solve.
1. Skip-count by six to fill in the blanks. Match each number in the count-by with its multiplication fact.

Name ________________________________ Date __________________

6  ______________  9 × 6

18  ______________  6 × 6

30  ______________  4 × 6

36  ______________  7 × 6

48  ______________  1 × 6

60  ______________  3 × 6
2. Count by six to fill in the blanks below.

6, ______, ______, ______

Complete the multiplication equation that represents the final number in your count-by.

6 × ______ = ______

Complete the division equation that represents your count-by.

______ ÷ 6 = ______

3. Count by six to fill in the blanks below.

6, ______, ______, ______, ______, ______, ______

Complete the multiplication equation that represents the final number in your count-by.

6 × ______ = ______

Complete the division equation that represents your count-by.

______ ÷ 6 = ______

4. Mrs. Byrne’s class skip-counts by six for a group counting activity. When she points up, they count up by six and when she points down, they count down by six. The arrows show when she changes direction.

a. Fill in the blanks below to show the group counting answers.

↑ 0, 6, _____, 18, _____↓ _____, 12 ↑ _____, 24, 30, _____↓ 30, 24, _____↑ 24, _____, 36, _____, 48

b. Mrs. Byrne says the last number that the class counts is the product of 6 and another number. Write a multiplication sentence and a division sentence to show she’s right.

6 × ______ = 48

48 ÷ 6 = ______

5. Julie counts by six to solve 6 × 7. She says the answer is 36. Is she right? Explain your answer.
1. Sylvia solves $6 \times 9$ by adding $48 + 6$. Show how Sylvia breaks apart and bonds her numbers to complete the ten. Then solve.

2. Skip-count by six to solve the following:
   
   a. $8 \times 6 = \underline{______}$
   b. $54 \div 6 = \underline{______}$
1. Use number bonds to help you skip-count by six by either making a ten or adding to the ones.

   a. \[6 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]

   b. \[12 + 6 = 10 + \_\_\_ = \_\_\_\]

   c. \[18 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]

   d. \[24 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]

   e. \[30 + 6 = \_\_\_\]

   f. \[36 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]

   g. \[42 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]

   h. \[48 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]

   i. \[54 + 6 = \_\_\_ + \_\_\_ = \_\_\_\]
2. Count by six to fill in the blanks below.

6, _____, _____, _____, _____

Complete the multiplication equation that represents the final number in your count-by.

6 × _______ = _______

Complete the division equation that represents your count-by.

_______ ÷ 6 = _______

3. Count by six to fill in the blanks below.

6, _____, _____, _____, _____

Complete the multiplication equation that represents the final number in your count-by.

6 × _______ = _______

Complete the division equation that represents your count-by.

_______ ÷ 6 = _______

1. Skip-count by seven to fill in the blanks and match each count-by to its multiplication expression. Then use the multiplication equation to write the related division fact directly to the right.

<table>
<thead>
<tr>
<th>Count-by</th>
<th>Multiplication Expression</th>
<th>Division Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>$7 \times 6$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>21</td>
<td>$7 \times 3$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>42</td>
<td>$7 \times 8$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>49</td>
<td>$7 \times 7$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>22</td>
<td>$7 \times 1$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>35</td>
<td>$7 \times 5$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>35</td>
<td>$7 \times 9$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>28</td>
<td>$7 \times 4$</td>
<td>$________ \div 7 = ________$</td>
</tr>
<tr>
<td>14</td>
<td>$7 \times 2$</td>
<td>$________ \div 7 = ________$</td>
</tr>
</tbody>
</table>
2. Complete the count by seven sequence below. Then write a multiplication equation and a division equation to represent each blank you filled in.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>b)</td>
<td>c)</td>
<td>d)</td>
<td>e)</td>
</tr>
</tbody>
</table>

7, 14, ______, 28, ______, 42, ______, ______, 63, ______

a) ______ × 7 = ______  ______ ÷ 7 = ______
b) ______ × 7 = ______  ______ ÷ 7 = ______
c) ______ × 7 = ______  ______ ÷ 7 = ______
d) ______ × 7 = ______  ______ ÷ 7 = ______
e) ______ × 7 = ______  ______ ÷ 7 = ______

3. Abe says 3 × 7 = 21 because 1 seven is 7, 2 sevens are 14 and 3 sevens are 14 + 6 + 1, which equals 21. Why did Abe add 6 and 1 to 14, when he is counting by seven?

4. Molly says she can count by seven 6 times to solve 7 × 6. James says he can count by six 7 times to solve this problem. Who is right? Explain your answer.
Name ____________________________ Date ________________

Complete the count by seven sequence below. Then write a multiplication equation and a division equation to represent each number in the sequence.

7, 14, ______, 28, ______, 42, ______, ______, 63, ______

a. ______ × 7 = ______ ______ ÷ 7 = ______
b. ______ × 7 = ______ ______ ÷ 7 = ______
c. ______ × 7 = ______ ______ ÷ 7 = ______
d. ______ × 7 = ______ ______ ÷ 7 = ______
e. ______ × 7 = ______ ______ ÷ 7 = ______
f. ______ × 7 = ______ ______ ÷ 7 = ______
g. ______ × 7 = ______ ______ ÷ 7 = ______
h. ______ × 7 = ______ ______ ÷ 7 = ______
i. ______ × 7 = ______ ______ ÷ 7 = ______
j. ______ × 7 = ______ ______ ÷ 7 = ______
Lesson 5 Homework

Name ________________________________ Date ____________________

1. Use number bonds to help you skip-count by seven by making ten or adding to the ones.

   (a) 7 + 7 = \_
        / \ 10 + 4 = ______ 
        3 \ 4

   (b) 14 + 7 = \_
        / \ ______ + ______ = ______ 
        6 \ 1

   (c) 21 + 7 = \_
        / \ ______ + ______ = ______ 
        20 \ 1

   (d) 28 + 7 = \_
        / \ ______ + ______ = ______ 
        2 \ 5

   (e) 35 + 7 = \_
        / \ ______ 
        5 \ 2

   (f) 42 + 7 = \_
        / \ ______ + ______ = ______

   (g) 49 + 7 = \_
        / \ ______ + ______ = ______

   (h) 56 + 7 = \_
        / \ ______ + ______ = ______
2. Skip-count by seven to fill in the blanks. Then use the multiplication equation to write the related division fact directly to the right.

\[
\begin{align*}
7 \times 10 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 9 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 8 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 7 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 6 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 5 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 4 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 3 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 2 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad} \\
7 \times 1 &= \underline{\quad} & \underline{\quad} & \div 7 &= \underline{\quad}
\end{align*}
\]
1. Label the tape diagrams. Then fill in the blanks below to make the statements true.

a. \(6 \times 6 = \) 

\[
\begin{align*}
(5 \times 6) &= \_\_\_ \\
(\_\_\_ \times 6) &= \_\_\_
\end{align*}
\]

\[
\begin{array}{c}
6 \\
\hline
\end{array}
\]

\[
(6 \times 6) = (5 + 1) \times 6 \\
= (5 \times 6) + (1 \times 6) \\
= 30 + \_\_\_ \\
= \_\_\_
\]

b. \(7 \times 6 = \) 

\[
\begin{align*}
(5 \times 6) &= \_\_\_ \\
(\_\_\_ \times 6) &= \_\_\_
\end{align*}
\]

\[
\begin{array}{c}
6 \\
\hline
\end{array}
\]

\[
(7 \times 6) = (5 + 2) \times 6 \\
= (5 \times 6) + (2 \times 6) \\
= 30 + \_\_\_ \\
= \_\_\_
\]

c. \(8 \times 6 = \) 

\[
\begin{align*}
(5 \times 6) &= \_\_\_ \\
(\_\_\_ \times 6) &= \_\_\_
\end{align*}
\]

\[
\begin{array}{c}
6 \\
\hline
\end{array}
\]

\[
8 \times 6 = (5 + \_\_\_) \times 6 \\
= (5 \times 6) + (\_\_\_ \times 6) \\
= 30 + \_\_\_ \\
= \_\_\_
\]

d. \(9 \times 6 = \) 

\[
\begin{align*}
(5 \times 6) &= \_\_\_ \\
(\_\_\_ \times 6) &= \_\_\_
\end{align*}
\]

\[
\begin{array}{c}
6 \\
\hline
\end{array}
\]

\[
9 \times 6 = (5 + \_\_\_) \times 6 \\
= (5 \times 6) + (\_\_\_ \times 6) \\
= 30 + \_\_\_ \\
= \_\_\_
\]
Lesson 6

Use the distributive property as a strategy to multiply and divide using units of 6 and 7.

Date: 7/31/13

2. Break apart 54 to solve \(54 \div 6\).

\[
\begin{array}{c}
54 \div 6 \\
\downarrow \\
30 \div 6 \\
\downarrow \\
24 \div 6 \\
\end{array}
\]

\(54 \div 6 = (30 \div 6) + (\_\_\_\_\_\_\_\_ \div 6)\)

\[= 5 + \_\_\_\_\_\_\_\_
\]

\[= \_\_\_\_\_\_\_
\]

3. Break apart 49 to solve \(49 \div 7\).

\[
\begin{array}{c}
49 \div 7 \\
\downarrow \\
35 \div 7 \\
\downarrow \\
24 \div 6 \\
\end{array}
\]

\(49 \div 7 = (35 \div 7) + (\_\_\_\_\_\_\_\_ \div 7)\)

\[= 5 + \_\_\_\_\_\_\_\_
\]

\[= \_\_\_\_\_\_\_
\]

4. Robert says that he can solve \(6 \times 8\) by thinking of it as \((5 \times 8) + 8\). Is he right? Draw a picture to help you explain your answer.

5. Kelly solves \(42 \div 7\) by using a number bond to break apart 42 into two parts. Show what her work might look like below.
1. A parking lot has space for 48 cars. Each row has 6 parking spaces. Break apart 48 to find how many cars can park in each row.

2. Malia solves $6 \times 7$ using $(5 \times 7) + 7$. Leonidas solves $6 \times 7$ using $(6 \times 5) + (6 \times 2)$. Who is correct? Draw a picture to help you explain your answer.
1. Label the tape diagrams. Then fill in the blanks below to make the statements true.

a. \( 6 \times 7 = \)______

\[
(5 \times 7) = \underline{\hspace{2cm}} \quad (\underline{\hspace{2cm}} \times 7) = \underline{\hspace{2cm}}
\]

\[
7 \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \quad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad 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\[
(5 \times 7) = \underline{\hspace{2cm}} \quad (\underline{\hspace{2cm}} \times 7) = \underline{\hspace{2cm}}
\]

\[
7 \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \quad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qanda. \( 8 \times 7 = \)______

\[
(5 \times 7) = \underline{\hspace{2cm}} \quad (\underline{\hspace{2cm}} \times 7) = \underline{\hspace{2cm}}
\]

\[
7 \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qanda. \( 9 \times 7 = \)______

\[
(5 \times 7) = \underline{\hspace{2cm}} \quad (\underline{\hspace{2cm}} \times 7) = \underline{\hspace{2cm}}
\]
2. Break apart 54 to solve $54 \div 6$.

\[
\begin{align*}
54 \div 6 &= (30 \div 6) + (\underline{\quad} \div 6) \\
&= 5 + \underline{\quad} \\
&= \underline{\quad}
\end{align*}
\]

3. Break apart 56 to solve $56 \div 7$.

\[
\begin{align*}
56 \div 7 &= (35 \div 7) + (\underline{\quad} \div 7) \\
&= 5 + \underline{\quad} \\
&= \underline{\quad}
\end{align*}
\]

4. Forty-two third grade students sit in 6 equal rows in the auditorium. How many students sit in each row? Show your thinking.

5. Ronaldo solves $7 \times 6$ by thinking of it as $(5 \times 7) + 7$. Is he correct? Explain Ronaldo’s strategy.
Lesson 7 Problem Set

Name _____________________________ Date ________________

1. Match the words to the correct equation.

- A number times 6 equals 30
  - \( n \times 6 = 30 \)
- 7 times a number equals 42
  - \( 7 \times n = 42 \)
- 6 times 7 equals a number
  - \( 6 \times 7 = n \)
- 63 divided by a number equals 9
  - \( 63 \div n = 9 \)
- 36 divided by a number equals 6
  - \( 36 \div n = 6 \)
- A number times 7 equals 21
  - \( n \times 7 = 21 \)

2. Write an equation to represent the tape diagram below and solve for the unknown.

- \[ \underline{8 \ 8 \ 8 \ 8 \ 8 \ 8} \]
  - \( k \)

Equation: ___________________________________
3. Model each problem with a drawing. Then, write an equation using a letter to represent the unknown and solve for the unknown.
   a. Each student gets 3 pencils. There are a total of 21 pencils. How many students are there?
   b. Henry spends 24 minutes practicing 6 different basketball drills. He spends the same amount of time on each drill. How much time does Henry spend on each drill?
   c. Jessica has 8 pieces of yarn for a project. Each piece of yarn is 6 centimeters long. What is the total length of the yarn?
   d. Ginny measures 6 milliliters of water into each beaker. She pours a total of 54 milliliters. How many beakers does Ginny use?
Lesson 7 Exit Ticket

Name __________________________________________ Date ______________________

1. Three boys and three girls each buy 7 bookmarks. How many bookmarks do they buy altogether? Write an equation using a letter to represent the unknown. Then solve for the unknown.

2. Seven friends equally share the cost of a $56 meal. How much does each person pay? Write an equation using a letter to represent the unknown. Then solve for the unknown.
1. Match the words on the arrow to the correct equation on the target.

- 7 times a number equals 42
  - $n \times 7 = 21$

- 63 divided by a number equals 9
  - $7 \times n = 42$

- 36 divided by a number equals 6
  - $63 \div n = 9$

- A number times 7 equals 21
  - $36 \div n = 6$
2. Ari sells 6 boxes of pens at the school store.
   a. Each box of pens sells for $7. Draw a tape diagram and label the total amount of money he makes as \( m \). Write an equation and solve for \( m \).

   b. Each box contains 6 pens. Draw a tape diagram and label the total number of pens as \( p \). Write an equation and solve for \( p \).

3. Mr. Lucas divides 28 students into 7 equal groups for a project. Draw a tape diagram and label the number of students in each group as \( n \). Write an equation and solve for \( n \).
Lesson 8 Problem Set

Name __________________________________________________________________________ Date __________________

1. Solve.
   a. \((12 - 4) + 6 = \) ______
   b. \(12 - (4 + 6) = \) ______
   c. _____ = \(15 - (7 + 3)\)
   d. _____ = \((15 - 7) + 3\)
   e. _____ = \((3 + 2) \times 6\)
   f. _____ = \(3 + (2 \times 6)\)
   g. \(4 \times (7 - 2) = \) ______
   h. \((4 \times 7) - 2 = \) ______
   i. _____ = \((12 \div 2) + 4\)
   j. _____ = \(12 \div (2 + 4)\)
   k. \(9 + (15 \div 3) = \) ______
   l. \((9 + 15) \div 3 = \) ______
   m. \(60 \div (10 - 4) = \) ______
   n. \((60 \div 10) - 4 = \) ______
   o. _____ = \(35 + (10 \div 5)\)
   p. _____ = \((35 + 10) \div 5\)

2. Use parentheses to show the order you would need to do the operations to make the equation true.

<table>
<thead>
<tr>
<th>a. (16 - 4 + 7 = 19)</th>
<th>b. (16 - 4 + 7 = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. (2 = 22 - 15 + 5)</td>
<td>d. (12 = 22 - 15 + 5)</td>
</tr>
<tr>
<td>e. (3 + 7 \times 6 = 60)</td>
<td>f. (3 + 7 \times 6 = 45)</td>
</tr>
<tr>
<td>g. (5 = 10 \div 10 \times 5)</td>
<td>h. (50 = 100 \div 10 \times 5)</td>
</tr>
<tr>
<td>i. (26 - 5 \div 7 = 3)</td>
<td>j. (36 = 4 \times 25 - 16)</td>
</tr>
</tbody>
</table>
3. The teacher writes $24 \div 4 + 2 = \underline{\hspace{2cm}}$ on the board. Chad says it equals 8. Samir says it equals 4. Explain how placing the ( ) in the equation can make both answers true.

4. Natasha solves the equation below by finding the sum of 5 and 12. Place the ( ) around the equation to show her thinking. Then solve.

$$12 + 15 \div 3 = \underline{\hspace{2cm}}$$

5. Find two possible answers to the expression $7 + 3 \times 2$ by placing ( ) around different numbers.
1. Use parentheses to make the equations true.

   a. \(24 = 32 - 14 + 6\)  
   b. \(12 = 32 - 14 + 6\)  
   c. \(2 + 8 \times 7 = 70\)  
   d. \(2 + 8 \times 7 = 58\)

2. Marcos solves \(24 \div 6 + 2 = \) ______. He says it equals 6. Iris says it equals 3. Show and explain how the position of parentheses in the equation can make both answers true.
Lesson 8 Homework

Name ________________________________ Date ________________________

1. Solve.
   a. $9 - (6 + 3) = \_\_\_\_\_\_\_\_\_
   b. $(9 - 6) + 3 = \_\_\_\_\_\_\_\_\_
   c. $\_\_\_\_\_\_\_\_\_ = 14 - (4 + 2)$
   d. $\_\_\_\_\_\_\_\_\_ = (14 - 4) + 2$
   e. $\_\_\_\_\_\_\_\_\_ = (4 + 3) \times 6$
   f. $\_\_\_\_\_\_\_\_\_ = 4 + (3 \times 6)$
   g. $(18 ÷ 3) + 6 = \_\_\_\_\_\_\_\_\_
   h. $18 ÷ (3 + 6) = \_\_\_\_\_\_\_\_\_

2. Use parentheses to make the equations true.
   a. $14 - 8 + 2 = 4$
   b. $14 - 8 + 2 = 8$
   c. $2 + 4 \times 7 = 30$
   d. $2 + 4 \times 7 = 42$
   e. $5 = 50 ÷ 5 \times 2$
   f. $20 = 50 ÷ 5 \times 2$

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Lesson 8 Homework

3. Determine if the equation is true or false.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>(15 – 3) ÷ 2 = 6</td>
</tr>
<tr>
<td>b.</td>
<td>(10 – 7) × 6 = 18</td>
</tr>
<tr>
<td>c.</td>
<td>(35 – 7) ÷ 4 = 8</td>
</tr>
<tr>
<td>d.</td>
<td>28 = 4 × (20 – 13)</td>
</tr>
<tr>
<td>e.</td>
<td>35 = (22 - 8) ÷ 5</td>
</tr>
</tbody>
</table>

4. Jerome finds that (3 × 6) ÷ 2 and 18 ÷ 2 are equal. Explain why this is true.

5. Place parentheses in the equation below so that you solve by finding the difference between 28 and 3. Find the answer.

4 × 7 – 3 =

6. Johnny says that the answer to 2 × 6 ÷ 3 is 4 no matter where the parentheses are. Do you agree? Place parentheses around different numbers to show his thinking.
Solve the following pairs of problems. Circle the pairs where both problems have the same answer.

1. a. $7 + (6 + 4)$  
   b. $(7 + 6) + 4$

2. a. $(3 \times 2) \times 4$  
   b. $3 \times (2 \times 4)$

3. a. $(2 \times 1) \times 5$  
   b. $2 \times (1 \times 5)$

4. a. $(4 \times 2) \times 2$  
   b. $4 \times (2 \times 2)$

5. a. $(3 + 2) \times 5$  
   b. $3 + (2 \times 5)$

6. a. $(8 \div 2) \times 2$  
   b. $8 \div (2 \times 2)$

7. a. $(9 \times 5) + 3$  
   b. $9 - (5 + 3)$

8. a. $(8 \times 5) - 4$  
   b. $8 \times (5 - 4)$
1. Use the array to complete the equation.

   a) \( 3 \times 12 = \) 
   
   b) \( (3 \times 3) \times 4 = \) 
   
   c) \( 3 \times 14 = \) 
   
   d) \( (\_\_\_ \times \_\_\_ ) \times 7 = \)
2. Place ( ) in the equations to simplify. Then solve. The first one has been done for you.

\[
\begin{align*}
3 \times 16 &= 3 \times (2 \times 8) \\
&= (3 \times 2) \times 8 \\
&= \text{____6____} \times 8
\end{align*}
\]

\[
\begin{align*}
2 \times 14 &= 2 \times (2 \times 7) \\
&= (2 \times 2) \times 7 \\
&= \text{____} \times 7
\end{align*}
\]

\[
\begin{align*}
3 \times 12 &= 3 \times (3 \times 4) \\
&= 3 \times 3 \times 4 \\
&= \text{____} \times \text{____}
\end{align*}
\]

\[
\begin{align*}
3 \times 14 &= 3 \times 2 \times 7 \\
&= 3 \times 2 \times 7 \\
&= \text{____} \times \text{____}
\end{align*}
\]

\[
\begin{align*}
15 \times 3 &= 5 \times 3 \times 3 \\
&= 5 \times 3 \times 3 \\
&= \text{____} \times \text{____}
\end{align*}
\]

\[
\begin{align*}
15 \times 2 &= 5 \times 3 \times 2 \\
&= 5 \times 3 \times 2 \\
&= \text{____} \times \text{____}
\end{align*}
\]

3. Charlotte finds the answer to 16 × 2 by thinking about 8 × 4. Explain her strategy.
Name ____________________________  Date ________________

Simplify to find the answer to $18 \times 3$. Show your work and explain your strategy.
1. Use the array to complete the equation.

   a. \( 3 \times 16 = \) _____

   

   b. \((3 \times \text{____}) \times 8\)  
      
      = \text{____} \times \text{____}  
      
      = ____

   

   c. \(4 \times 18 = \) _____

   

   d. \((4 \times \text{____}) \times 9\)  
      
      = \text{____} \times \text{____}  
      
      = ____
2. Place ( ) in the equations to simplify and solve.

\[ 12 \times 4 = (6 \times 2) \times 4 \]
\[ = 6 \times (2 \times 4) \]
\[ = 6 \times 8 \]
\[ = \underline{48} \]

\[ 3 \times 14 = 3 \times (2 \times 7) \]
\[ = (3 \times 2) \times 7 \]
\[ = \underline{\_ \_ \_ \_} \times 7 \]

\[ 3 \times 12 = 3 \times (3 \times 4) \]
\[ = 3 \times 3 \times 4 \]
\[ = \underline{\_ \_ \_ \_} \times 4 \]

3. Solve. Then match the related facts.

a. \[ 20 \times 2 = \underline{\_ \_ \_ \_} = \underline{40} \]
   \[ 6 \times (5 \times 2) \]

b. \[ 30 \times 2 = \underline{\_ \_ \_ \_} = \underline{8 \times 5 \times 2} \]

c. \[ 35 \times 2 = \underline{\_ \_ \_ \_} = \underline{4 \times 5 \times 2} \]

d. \[ 40 \times 2 = \underline{\_ \_ \_ \_} = \underline{7 \times 5 \times 2} \]
Lesson 10 Problem Set

Name __________________________ Date ________________

1. Label the arrays. Then fill in the blanks below to make the statements true.
   a) \(8 \times 8 = \) ______

   \((8 \times 5) = \) ______  \((8 \times \_\_\_\_) = \) ______

   \(8 \times 8 = 8 \times (5 + \_\_\_\_)\)
   \(= 8 \times 5 + (8 \times \_\_\_\_)\)
   \(= \_\_\_\_ + \_\_\_\_\_\)
   \(= \_\_\_\_\_\_\)

   b) \(8 \times 9 = 9 \times 8 = \) ______

   \((8 \times 5) = \) ______  \((8 \times \_\_\_\_) = \) ______

   \(9 \times 8 = 8 \times (5 + \_\_\_\_)\)
   \(= 8 \times 5 + (8 \times \_\_\_\_)\)
   \(= \_\_\_\_ + \_\_\_\_\_\)
   \(= \_\_\_\_\_\_\)

2. Break apart and distribute to solve \(56 \div 8\).

   \(\begin{array}{c}
   \text{56} \div 8 \\
   \text{40} \div 8 \\
   \text{16} \div 8
   \end{array}\)

   \(56 \div 8 = (40 \div 8) + (\_\_\_\_\_\_ \div 8)\)
   \(= 5 + \_\_\_\_\_\_\)
   \(= \_\_\_\_\_\_\)

3. Break apart and distribute to solve \(72 \div 8\).

   \(\begin{array}{c}
   \text{72} \div 8 \\
   \text{40} \div 8
   \end{array}\)

   \(72 \div 8 = (40 \div 8) + (\_\_\_\_\_\_ \div 8)\)
   \(= 5 + \_\_\_\_\_\)
   \(= \_\_\_\_\_\_\)

Use the distributive property as a strategy to multiply and divide.

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4. An octagon has 8 sides. Skip-count to find the total number of sides on 9 octagons.

Eight

16

Nine octagons have a total of _________ sides.

5. Multiply.

\[ 4 \times 8 = 32 \]

\[ 8 \times 6 = \]

\[ 3 \times 8 = \]

\[ 8 \times 10 = \]

\[ 8 \times 8 = \]

\[ 7 \times 8 = \]
6. Match.

- $24 \div 8$
- $32 \div 8$
- $16 \div 8$
- $64 \div 8$
- $48 \div 8$
- $72 \div 8$

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
Use the break apart and distribute strategy to solve the following problem. You may or may not choose to draw an array.

\[ 7 \times 8 = \underline{\phantom{00}} \]
1. Label the array. Then fill in the blanks to make the statements true.

   \[ 8 \times 7 = 7 \times 8 = \_ \_ \_ \]

   \[ \begin{array}{c}
   (7 \times 5) = \_ \_ \_ ; (7 \times \_ \_ \_) = \_ \_ \_ \\
   \begin{array}{c|c}
   \hline
   7 & 5 \\
   \hline
   7 & 5 \\
   \hline
   7 & 5 \\
   \hline
   7 & 5 \\
   \hline
   \end{array}
   \end{array} \]

   \[ 8 \times 7 = 7 \times (5 + \_ \_ \_) \\
   = (7 \times 5) + (7 \times \_ \_ \_) \\
   = \_ \_ \_ + \_ \_ \_ \_ \\
   = \_ \_ \_ \]
3. Count by 8. Then match each multiplication problem with its value.

\[ 8, 14, 21, 28, 35, 42, 49, 56, 63, 70 \]

4. Divide.

\[ \begin{align*}
16 \div 8 &= \underline{2} \\
40 \div 8 &= \underline{5} \\
32 \div 8 &= \underline{4} \\
48 \div 8 &= \underline{6} \\
56 \div 8 &= \underline{7} \\
72 \div 8 &= \underline{9}
\end{align*} \]
1. Ms. Santor divides 32 students into 8 equal groups for a field trip. Draw a tape diagram and label the number of students in each group as $n$. Write an equation and solve for $n$.

2. Tara buys 6 packs of printer paper. Each pack of paper costs $8. Draw a tape diagram and label the total amount she spends as $m$. Write an equation and solve for $m$.

3. Mr. Reed spends $24 on coffee beans. How many kilograms of coffee beans does he buy? Draw a tape diagram and label the total amount of coffee beans he buys as $c$. Write an equation and solve for $c$. 

$8 \text{ for } 1 \text{ kg}$
4. Eight boys equally share 4 packs of baseball cards. Each pack contains 10 cards. How many cards does each boy get?

5. There are 8 bags of yellow and green balloons. Each bag contains 7 balloons. If there are 35 yellow balloons, how many green balloons are there?

6. The fruit seller packs 72 oranges into bags of 8 each. He sells all the oranges at $4 a bag. How much money did he receive?
Lesson 11 Exit Ticket

Name ___________________________  Date __________________

1. Erica buys some packs of rubber bracelets. There are 8 bracelets in each pack.
   
a. How many packs of rubber bracelets does she buy if she has a total of 56 bracelets? Draw a tape
diagram and label the total number of packages as \( p \). Write an equation and solve for \( p \).

b. After giving some bracelets away, Erica has 18 bracelets left. How many did she give away?
1. Jenny bakes 10 cookies. She puts 7 chocolate chips on each cookie. Draw a tape diagram and label the total of amount of chocolate chips as \( c \). Write an equation and solve for \( c \).

2. Mr. Lopez arranges 48 dry erase markers into 8 equal groups for his math stations. Draw a tape diagram and label the number of dry erase markers in each group as \( v \). Write an equation and solve for \( v \).

3. There are 35 computers in the lab. Five students each turn off an equal number of computers. How many computers does each student turn off? Label the unknown as \( m \), then solve.
4. There are 9 bins of books. Each bin has 6 comic books. How many comic books are there altogether?

5. There are 8 trail mix bags in one box. Clarissa buys 5 boxes. She gives an equal number of bags of trail mix to 4 friends. How many bags of trail mix does each friend receive?

6. Leo earns $8 a week for doing chores. After 7 weeks, he buys a gift and has $38 left. How much does he spend on the gift?
Name ____________________________________________  Date ________________

1. Each block has a value of 9. Find the value of each row. Then add the rows to find the total.

   a. 6 × 9 = _____

      5 × 9 = 45

      1 × 9 = _____

      6 × 9 = (5 + 1) × 9
              = (5 × 9) + (1 × 9)
              = 45 + _____
              = _____

   b. 7 × 9 = _____

      5 × 9 = 45

      _____ × 9 = _____

      7 × 9 = (5 + _____) × 9
              = (5 × 9) + (_____ × 9)
              = 45 + _____
              = _____

   c. 8 × 9 = _____

      5 × 9 = _____

      _____ × 9 = _____

      8 × 9 = (5 + _____) × 9
              = (5 × 9) + (_____ × _____)
              = 45 + _____
              = _____

   d. 9 × 9 = _____

      5 × 9 = _____

      _____ × 9 = _____

      9 × 9 = (5 + _____) × 9
              = (5 × 9) + (_____ × _____)
              = 45 + _____
              = _____
2. Find the total value of the shaded blocks.

   a. $9 \times 6 = \underline{\hspace{2cm}}$

   \[
   \begin{array}{cccc}
   & & & \\
   & & & \\
   6 & & & \\
   \\
   \end{array}
   \]

   $9 \text{ sixes} = 10 \text{ sixes} - 1 \text{ six}$

   \[\underline{\hspace{2cm}} - 6\]

   \[= \underline{\hspace{2cm}}\]

   b. $9 \times 7 = \underline{\hspace{2cm}}$

   \[
   \begin{array}{cccc}
   & & & \\
   & & & \\
   7 & & & \\
   \\
   \end{array}
   \]

   $9 \text{ sevens} = 10 \text{ sevens} - 1 \text{ seven}$

   \[\underline{\hspace{2cm}} - 7\]

   \[= \underline{\hspace{2cm}}\]

   c. $9 \times 8 = \underline{\hspace{2cm}}$

   \[
   \begin{array}{cccc}
   & & & \\
   & & & \\
   8 & & & \\
   \\
   \end{array}
   \]

   $9 \text{ eights} = 10 \text{ eights} - 1 \text{ eight}$

   \[\underline{\hspace{2cm}} - 8\]

   \[= \underline{\hspace{2cm}}\]

   d. $9 \times 9 = \underline{\hspace{2cm}}$

   \[
   \begin{array}{cccc}
   & & & \\
   & & & \\
   9 & & & \\
   \\
   \end{array}
   \]

   $9 \text{ nines} = 10 \text{ nines} - 1 \text{ nine}$

   \[\underline{\hspace{2cm}} - \underline{\hspace{2cm}}\]

   \[= \underline{\hspace{2cm}}\]

3. Matt buys a pack of postage stamps. He counts 9 rows of 4 stamps. He thinks of 10 fours to find the total number of stamps. Show the strategy that Matt might have used to find the total number of stamps.
4. Match.

- $3 \times 9$ matches with 81
- $9 \times 9$ matches with 27
- $8 \times 9$ matches with 36
- $9 \times 4$ matches with 36
- $2 \times 9$ matches with 18

- $45 \div 9$ matches with 5
- $9 \div 9$ matches with 1
- $72 \div 9$ matches with 8
- $54 \div 9$ matches with 6
- $90 \div 9$ matches with 10
1. Each block has a value of 9. Complete the equations to find the total value of the tower of blocks.

\[
\underline{} \times 9 = (5 + \underline{}) \times 9
\]

\[
= (5 \times \underline{}) + (\underline{} \times \underline{})
\]

\[
= 45 + \underline{}
\]

\[
= \underline{}
\]

2. Hector solves \(9 \times 8\) by subtracting 1 eight from 10 eights. Draw a model and explain Hector’s strategy.
1. Find the value of each row. Then add the rows to find the total.

a. Each \( \square \) has a value of 6.
\[ 9 \times 6 = \]  
\[ 5 \times 6 = 30 \]
\[ 4 \times 6 = \]

\[ 9 \times 6 = (5 + 4) \times 6 \]
\[ = (5 \times 6) + (4 \times 6) \]
\[ = 30 + \]
\[ = \]

b. Each \( \square \) has a value of 7.
\[ 9 \times 7 = \]  
\[ 5 \times 7 = \]
\[ \_ \times 7 = \]

\[ 9 \times 7 = (5 + \_\_) \times 7 \]
\[ = (5 \times 7) + (\_\_ \times 7) \]
\[ = 35 + \]
\[ = \]

c. Each \( \square \) has a value of 8.
\[ 9 \times 8 = \]  
\[ 5 \times 8 = \]
\[ \_ \times 8 = \]

\[ 9 \times 8 = (5 + \_\_) \times 8 \]
\[ = (5 \times 8) + (\_\_ \times \_\_) \]
\[ = 40 + \]
\[ = \]

d. Each \( \square \) has a value of 9.
\[ 9 \times 9 = \]  
\[ 5 \times 9 = \]
\[ \_ \times 9 = \]

\[ 9 \times 9 = (5 + \_\_) \times 9 \]
\[ = (5 \times 9) + (\_\_ \times \_\_) \]
\[ = 45 + \]
\[ = \]
2. Match.

a. 9 fives = 10 fives – 1 five
   = 50 – 5
   [Diagram with number 45]

b. 9 sixes = 10 sixes – 1 six
   = _____ – 6
   [Diagram with number 63]

c. 9 sevens = 10 sevens – 1 seven
   = _____ – 7
   [Diagram with number 54]

d. 9 eights = 10 eights – 1 eight
   = _____ – 8
   [Diagram with number 81]

e. 9 nines = 10 nines – 1 nine
   = _____ – _____
   [Diagram with number 72]

f. 9 fours = 10 fours – 1 four
   = _____ – _____
   [Diagram with number 36]
Lesson 12:
Apply the distributive property and the fact 9 = 10 – 1 as a strategy to multiply.

Date: 7/31/13
Name ________________________________ Date __________________

1. a. Skip-count by nine.

9, 18, 27, 36, 45, 54, 63, 72, _______

b. Look at the **tens** place in the count-by. What is the pattern?

c. Look at the **ones** place in the count-by. What is the pattern?

2. Complete to make true statements.

a. 10 more than 0 is _______10____, 1 less is _______9____.

   1 × 9 = _______9____

b. 10 more than 9 is _______19____, 1 less is _______8____.

   2 × 9 = _______

c. 10 more than 18 is _______, 1 less is _______.

   3 × 9 = _______

d. 10 more than 27 is _______, 1 less is _______.

   4 × 9 = _______

e. 10 more than 36 is _______, 1 less is _______.

   5 × 9 = _______

f. 10 more than 45 is _______, 1 less is _______.

   6 × 9 = _______

g. 10 more than 54 is _______, 1 less is _______.

   7 × 9 = _______

h. 10 more than 63 is _______, 1 less is _______.

   8 × 9 = _______

i. 10 more than 72 is _______, 1 less is _______.

   9 × 9 = _______

j. 10 more than 81 is _______, 1 less is _______.

   10 × 9 = _______
3.  a. Analyze the equations in Problem 2. What is the pattern?

b. Use the pattern to find the next 4 facts. Show your work.

\[
\begin{align*}
11 \times 9 &= 99 \\
12 \times 9 &= 108 \\
13 \times 9 &= 117 \\
14 \times 9 &= 126
\end{align*}
\]

c. Kent notices another pattern in Problem 2. His work is shown below. He sees that:

- the tens digit in the product is 1 less than the number of groups
- the ones digit in the product is 10 minus the number of groups

\[
\begin{array}{ccc}
\text{tens digit} & \text{ones digit} \\
2 \times 9 = 18 & \Rightarrow & 1 = 2 - 1 \\
3 \times 9 = 27 & \Rightarrow & 2 = 3 - 1 \\
4 \times 9 = 36 & \Rightarrow & 3 = 4 - 1 \\
5 \times 9 = 45 & \Rightarrow & 4 = 5 - 1
\end{array}
\]

Use Kent’s strategy to solve 6 \times 9 and 7 \times 9.

d. Show an example of when Kent’s pattern doesn’t work.
Lesson 13 Problem Set

4. Each number sentence contains a letter representing the unknown. Find the value of each unknown. Then write the letters that match the answers to solve the riddle.

\[ a \times 9 = 54 \]
\[ a = ____ \]

\[ 81 \div 9 = g \]
\[ g = ____ \]

\[ 9 \times d = 72 \]
\[ d = ____ \]

\[ o \div 9 = 10 \]
\[ o = ____ \]

\[ e \times 9 = 63 \]
\[ e = ____ \]

\[ 9 \times n = 27 \]
\[ n = ____ \]

\[ 9 \times s = 36 \]
\[ s = ____ \]

\[ t \times 9 = 18 \]
\[ t = ____ \]

\[ i \div 9 = 5 \]
\[ i = ____ \]

How do you make one vanish?

6 8 8 6 9 6 3 8 45 2 4 9 90 3 7 !
1. $6 \times 9 = 54$  
   What is 10 more than 54? _______  
   What is 1 less? _______  
   $7 \times 9 = _______$

2. $8 \times 9 = 72$  
   What is 10 more than 72? _______  
   What is 1 less? _______  
   $9 \times 9 = _______

2. Explain the pattern used in Problem 1.
1. 
   a. Skip-count by nines down from 90.
      
      \[90, \quad 81, \quad 72, \quad 63, \quad 54, \quad 45, \quad 36, \quad 27, \quad 18, \quad 9\]
      
   b. Look at the tens place in the count-by. What is the pattern?

   c. Look at the ones place in the count-by. What is the pattern?

2. Each number sentence contains a letter representing the unknown. Find the value of each unknown.

\[
\begin{align*}
  a \times 9 &= 18 & a &= \underline{2} \\
  m \div 9 &= 3 & m &= \underline{27} \\
  e \times 9 &= 45 & e &= \underline{5} \\
  f \div 9 &= 4 & f &= \underline{36} \\
  9 \times d &= 81 & d &= \underline{9} \\
  w \div 9 &= 6 & w &= \underline{54} \\
  9 \times s &= 90 & s &= \underline{10} \\
  k \div 9 &= 8 & k &= \underline{72}
\end{align*}
\]
3. Solve.

a. What is 10 more than 0? _____
   What is 1 less? _____
   1 × 9 = _____

b. What is 10 more than 9? _____
   What is 1 less? _____
   2 × 9 = _____

c. What is 10 more than 18? _____
   What is 1 less? _____
   3 × 9 = _____

d. 10 more than 27? _____
   What is 1 less? _____
   4 × 9 = _____

e. What is 10 more than 36? _____
   What is 1 less? _____
   5 × 9 = _____

f. What is 10 more than 45? _____
   What is 1 less? _____
   6 × 9 = _____

g. What is 10 more than 54? _____
   What is 1 less? _____
   7 × 9 = _____

h. What is 10 more than 63? _____
   What is 1 less? _____
   8 × 9 = _____

i. What is 10 more than 72? _____
   What is 1 less? _____
   9 × 9 = _____

j. What is 10 more than 81? _____
   What is 1 less? _____
   10 × 9 = _____

4. Explain the pattern in Problem 2 and use the pattern to find the next 3 facts.

11 × 9 = _____
12 × 9 = _____
13 × 9 = _____
Lesson 14 Problem Set

1. a. Multiply. Then add the tens digit and ones digit of each product.

\[
\begin{array}{c}
1 \times 9 = 9 \\
2 \times 9 = 18 \\
3 \times 9 = \\
4 \times 9 = \\
5 \times 9 = \\
6 \times 9 = \\
7 \times 9 = \\
8 \times 9 = \\
9 \times 9 = \\
10 \times 9 =
\end{array}
\]

\[
\begin{array}{c}
0 + 9 = 9 \\
1 + 8 = \\
+ = \\
+ = \\
+ = \\
+ = \\
+ = \\
+ = \\
+ = \\
+ = 
\end{array}
\]

b. What is the sum of the digits in each product? How can this strategy help you check your work with the nines facts?
2. Araceli uses the number of groups in $8 \times 9$ to help her find the product. She uses $8 - 1 = 7$ to get the digit in the tens place, and $10 - 8 = 2$ to get the digit in the ones place. Use her strategy to find 4 more facts.

3. Dennis calculates $9 \times 8$ by thinking about it as $80 - 8 = 72$. Explain Dennis’ strategy.

4. Sonya figures out the answer to $7 \times 9$ by putting down her right index finger, shown below. What is the answer? Explain how to use Sonya’s finger strategy.
Donald writes $7 \times 9 = 63$. Explain 2 strategies you could use to check his work.
1. Multiply. Then add the digits in each product.

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<tbody>
<tr>
<td>10 \times 9 = 90</td>
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<td>9 + 0 = 9</td>
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<tr>
<td>9 \times 9 = 81</td>
<td></td>
<td>8 + 1 = 9</td>
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<tr>
<td>8 \times 9 =</td>
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<td>7 \times 9 =</td>
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<tr>
<td>1 \times 9 =</td>
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</tbody>
</table>

What pattern did you notice in the table? How can this strategy help you check your work with nines facts?
2. Thomas calculates $9 \times 7$ by thinking about it as $70 - 7 = 63$. Explain Thomas’ strategy.

3. Alexia figures out the answer to $6 \times 9$ by lowering the thumb on her right hand, shown below. What is the answer? Explain Alexia’s strategy.

4. Travis writes $72 = 9 \times 8$. Is he correct? Explain at least 2 strategies Travis can use to help him check his work.
1. Mrs. Parson gives each of her grandchildren $9. She gave a total of $36. How many grandchildren does Mrs. Parson have? Write an equation and use a letter to represent the unknown.

2. Shiva pours 27 liters of water equally into 9 containers. How many liters of water are in each container?

3. Derek cuts 7 pieces of wire. Each piece is 9 meters long. What is the total length of the 7 pieces?
4. Aunt Deena and Uncle Chris share the cost of a limousine ride with their 7 friends. The ride cost a total of $63. If everyone shares the cost equally, how much does each person pay?

5. Cara bought 9 packs of beads. There are 10 beads in each pack. She always uses 30 beads to make each necklace. How many necklaces can she make if she uses all the beads?

6. There are 8 erasers in a set. Damon buys 9 sets. After giving some erasers away, Damon has 35 erasers left. How many erasers did he give away?
Lesson 15 Exit Ticket

Name ____________________________ Date ________________

1. Mrs. Aquino pours 36 liters of water equally into 9 containers. How much water is in each container? Use a letter to represent the unknown.

2. Marlon buys 9 packs of hot dogs. There are 6 hot dogs in each pack. After the barbeque, 35 hot dogs are left over. How many hot dogs were eaten?
1. The store clerk equally divides 36 apples between 9 baskets. Draw a tape diagram and label the number of apples in each basket as $a$. Write an equation and solve for $a$.

2. Elijah gives each of his friends a pack of 9 almonds. He gives away a total of 45 almonds. How many packs of almonds did he give away? Model using a letter to represent the unknown, then solve.

4. Mr. Doyle shares 1 roll of bulletin board paper equally with 8 teachers. The total length of the roll is 72 meters. How much bulletin board paper does each teacher get?

5. There are 9 pens in a pack. Ms. Ochoa buys 9 packs. After giving her students some pens, she has 27 pens left. How many pens did she give away?

6. Allen buys 9 packs of trading cards. There are 10 cards in each pack. He can trade 30 cards for a comic book. How many comic books can he get if he trades all of his cards?
1. Complete.

(a) _____ × 1 = 6  
(b) _____ ÷ 7 = 0  
(c) 8 × _____ = 8  
(d) 9 ÷ _____ = 9

(e) 0 ÷ 5 = _____  
(f) _____ × 0 = 0  
(g) 4 ÷ _____ = 1  
(h) _____ × 1 = 3

2. Match each equation with its solution.

3. Let \( n \) be a number. Complete the blanks below with the products.

\[
\begin{align*}
1 & \times n = 3 \\
n & \div 4 = 0 \\
1 & \times n = n \\
7 & \div 7 = n \\
n & \times 1 = 9 \\
n & \div 1 = 8 \\
\end{align*}
\]

\[
\begin{align*}
n & = 0 \\
n & = 9 \\
n & = 3 \\
n & = 8 \\
n & = 6 \\
n & = 1 \\
\end{align*}
\]

3. Let \( n \) be a number. Complete the blanks below with the products.

\[
\begin{align*}
1 & \times 1 \\
2 & \times 1 \\
3 & \times 1 \\
4 & \times 1 \\
5 & \times 1 \\
6 & \times 1 \\
7 & \times 1 \\
8 & \times 1 \\
9 & \times 1 \\
\end{align*}
\]

What pattern do you notice?
Lesson 16 Problem Set

4. Josie says that any number divided by 1 equals that number.
   a. Write a division equation using $n$ to represent Josie’s statement.
   b. Use your equation from Part (a). Let $n = 6$. Write a new equation and draw a picture to show that your equation is true.
   c. Write the related multiplication equation that you can use to check your division equation.

5. Matt explains what he learned about dividing with zero to his little sister.
   a. What might Matt tell his sister about solving $0 \div 9$? Explain your answer.
   b. What might Matt tell his sister about solving $8 \div 0$? Explain your answer.
   c. What might Matt tell his sister about solving $0 \div 0$? Explain your answer.
Name ____________________________________________ Date ________________________

1. Complete the equations.
   
   a. _____ × 1 = 5  
   b. 6 × _____ = 6  
   c. _____ ÷ 7 = 0  
   
   d. 5 × _____ = 0  
   e. 1 = 9 ÷ ____  
   f. 8 = 1 × ____  

2. Luis divides 8 by 0 and says it equals 0. Is he correct? Explain why or why not.
Lesson 16: Reason about and explain arithmetic patterns using units of 0 and 1 as they relate to multiplication and division.

Name ____________________________________________ Date __________________________

1. Solve.
   a. $4 \times 1 = _____$
   b. $4 \times 0 = _____$
   c. _____ $\times 1 = 5$
   d. _____ $\div 5 = 0$
   e. $6 \times _____ = 6$
   f. _____ $\div 6 = 0$
   g. $0 \div 7 = _____$
   h. $7 \times _____ = 0$
   i. $8 \div _____ = 8$
   j. _____ $\times 8 = 8$
   k. $9 \times _____ = 9$
   l. $9 \div _____ = 1$

2. Match each equation with its solution.

- $9 \times 1 = w$
  - $w = 6$

- $w \times 1 = 6$
  - $w = 7$

- $7 \div w = 1$
  - $w = 8$

- $1 \times w = 8$
  - $w = 9$

- $w \div 8 = 0$
  - $w = 1$

- $9 \div 9 = w$
  - $w = 0$
3. Let \( c = 8 \). Then determine whether the equations are true or false.

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>a.</td>
<td>( c \times 0 = 8 )</td>
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<tr>
<td>b.</td>
<td>( 0 \times c = 0 )</td>
</tr>
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<td>c.</td>
<td>( c \times 1 = 8 )</td>
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<td>d.</td>
<td>( 1 \times c = 8 )</td>
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<td>e.</td>
<td>( 0 \div c = 8 )</td>
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<td>f.</td>
<td>( 8 \div c = 1 )</td>
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<td>g.</td>
<td>( 0 \div c = 0 )</td>
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<tr>
<td>h.</td>
<td>( c \div 0 = 8 )</td>
</tr>
</tbody>
</table>

4. Rajan says that any number multiplied by 1 equals that number.
   a. Write a multiplication equation using \( n \) to represent Rajan’s statement.

   b. Using your equation from Part (a), let \( n = 5 \) and draw a picture to show that the new equation is true.
1. Write the products as fast as you can into the squares.

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</tbody>
</table>

a. Color all the squares with even products orange. Can an even product ever have an odd factor?

b. Can an odd product ever have an even factor?

c. Everyone knows that 7×4 = (5×4) + (2×4). Explain how this is shown in the table.

d. Use what you know to find the product of 7×16 or 8 sevens + 8 sevens.
2. In the table, only the products on the diagonal are shown.
   a. Label each product on the diagonal.

   b. Draw an array to match each expression in the table below. Then label the number of squares you added to make each new array. The first two arrays have been done for you.
c. What pattern do you notice in the number of squares that are added to each new array?

d. Use the pattern you discovered in Part b to prove this: $9 \times 9$ is the sum of the first 9 odd numbers.
1. Use what you know to find the product of $8 \times 12$ or $6$ eights + $6$ eights.

2. Luis says $3 \times 233 = 626$. Use what you learned about odd times odd to prove that Luis is wrong.
1. Write the products as fast as you can into the chart.

<table>
<thead>
<tr>
<th>×</th>
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</tbody>
</table>

a. Color the rows and columns with even factors yellow.

b. What do you notice about the factors and products that are left unshaded?

c. Complete the chart below by filling in each blank and writing an example for each rule.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>odd times odd equals _______</td>
<td></td>
</tr>
<tr>
<td>even times even equals ______</td>
<td></td>
</tr>
<tr>
<td>even times odd equals ______</td>
<td></td>
</tr>
</tbody>
</table>
d. Explain how \(7 \times 6 = (5 \times 6) + (2 \times 6)\) is shown in the table.

e. Use what you know to find the product of \(4 \times 16\) or 8 fours + 8 fours.

2. In the lesson, we found that \(n \times n\) is the sum of the first \(n\) odd numbers. Use this pattern to find the value of \(n\) for each equation below. The first is done for you.

a. \(1 + 3 + 5 = n \times n\)

   \[9 = 3 \times 3\]

b. \(1 + 3 + 5 + 7 = n \times n\)

c. \(1 + 3 + 5 + 7 + 9 + 11 = n \times n\)

d. \(1 + 3 + 5 + 7 + 9 + 11 + 13 + 17 = n \times n\)

e. \(1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 19 + 21 = n \times n\)
Name ________________________________ Date ________________

Directions: Use the RDW process for each problem. Explain why your answer is reasonable.

1. Rose has 6 pieces of yarn that are each 9 centimeters long. Sasha gives Rose a piece of yarn. Now Rose has a total of 81 centimeters of yarn. What is the length of the yarn that Sasha gives Rose?

2. Julio spends 29 minutes doing his spelling homework. He then completes each math problem in 4 minutes. There are 7 math problems. How many minutes does Julio spend on his homework in all?
3. Pearl buys 125 stickers. She gives 53 stickers to her little sister. Pearl then puts 9 stickers on each page of her album. If she used all of her remaining stickers, how many pages did Pearl put stickers on?

4. Tanner’s beaker had 45 milliliters of water in it at first. After each of his friends poured in 8 milliliters, the beaker contained 93 milliliters. How many friends poured water into Tanner’s beaker?

5. Cora weighs 4 new, identical pencils and a ruler. The total weight of these items is 55 grams. She weighs the ruler by itself and it weighs 19 grams. How much does each pencil weigh?
Directions: Use the RDW process to solve. Explain why your answer is reasonable.

On Saturday, Warren swims laps for 45 minutes in the pool. On Sunday, he runs 8 miles. If it takes him 9 minutes to run each mile, how long does Warren spend exercising over the weekend?
Directions: Use the RDW process for each problem. Explain why your answer is reasonable.

1. Mrs. Portillo’s cat weighs 6 kilograms. Her dog weighs 22 kilograms more than her cat. What is the total weight of her cat and dog?

2. Darren studies for his science test for 39 minutes. He then does 6 chores. Each chore takes him 3 minutes. How many minutes does Darren spend studying and doing chores?

3. Mr. Abbot buys 8 boxes of granola bars for a party. Each box has 9 granola bars. After the party, there are 39 bars left. How many bars were eaten during the party?
4. Leslie weighs her marbles in a jar, and the scale reads 474 grams. The empty jar weighs 439 grams. Each marble weighs 5 grams. How many marbles are in the jar?

5. Sharon uses 72 centimeters of ribbon to wrap gifts. Of that total, she uses 24 centimeters to wrap a big gift. She uses the remaining ribbon for 6 small gifts. How much ribbon will she use for each small gift if she uses the same amount on each?

6. Six friends equally share the cost of a gift. They pay $90 and receive $42 in change. How much does each friend pay?
Lesson 19 Problem Set

Name ____________________________ Date ____________________________

1. Use the disks to complete true number sentences.
   a. 1 1 1 1 1 1 1
      
      4 \times 3 \text{ ones} = \underline{\hspace{1cm}} \text{ ones}
      4 \times 3 = \underline{\hspace{1cm}}
   b. 10 10 10 10 10 10 10 10 10
      
      4 \times 3 \text{ tens} = \underline{\hspace{1cm}} \text{ tens}
      4 \times 30 = \underline{\hspace{1cm}}

2. Use the chart to complete true number sentences.

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

   a. 2 \times 4 \text{ ones} = \underline{\hspace{1cm}} \text{ ones}
      2 \times 4 = \underline{\hspace{1cm}}

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

   b. 2 \times 4 \text{ tens} = \underline{\hspace{1cm}} \text{ tens}
      2 \times 40 = \underline{\hspace{1cm}}

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

   c. 3 \times 5 \text{ ones} = \underline{\hspace{1cm}} \text{ ones}
      3 \times 5 = \underline{\hspace{1cm}}

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

   d. 3 \times 5 \text{ tens} = \underline{\hspace{1cm}} \text{ tens}
      3 \times 50 = \underline{\hspace{1cm}}
Lesson 19 Problem Set

3. Fill in the blank to make the statement true.

<table>
<thead>
<tr>
<th>a. ________ = 7 × 2</th>
<th>b. _____ tens = 7 tens × 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. ________ = 8 × 3</td>
<td>d. _____ tens = 8 tens × 3</td>
</tr>
<tr>
<td>e. ________ = 60 × 5</td>
<td>f. ________ = 4 × 80</td>
</tr>
<tr>
<td>g. 7 × 40 = ________</td>
<td>h. 50 × 8 = ________</td>
</tr>
</tbody>
</table>

4. A bus can carry 40 passengers. Use a tape diagram to find how many passengers 6 buses can carry.
1. Use the chart to complete true number sentences.

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

$6 \times 5$ ones = _____ ones

$6 \times 5 = _____$

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

$6 \times 5$ tens = _____ tens

$6 \times 50 = _____$

2. A small plane has 20 rows of seats. Each row has 4 seats.
   a. Find the total number of seats on the plane.

   b. How many seats are on 3 small planes?
1. Use the disks to complete true number sentences.

   a. 3 ones \times 3 = \underline{\hspace{1cm}} \text{ ones} \\
      3 \times 3 = \underline{\hspace{1cm}}

   b. 3 tens \times 3 = \underline{\hspace{1cm}} \text{ tens} \\
      30 \times 3 = \underline{\hspace{1cm}}

2. Use the chart to complete true number sentences.

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

   a. 2 \times 5 \text{ ones} = \underline{\hspace{1cm}} \text{ ones} \\
      2 \times 5 = \underline{\hspace{1cm}}

   b. 2 \times 5 \text{ tens} = \underline{\hspace{1cm}} \text{ tens} \\
      2 \times 50 = \underline{\hspace{1cm}}

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

   c. 5 \times 5 \text{ ones} = \underline{\hspace{1cm}} \text{ ones} \\
      5 \times 5 = \underline{\hspace{1cm}}

   d. 5 \times 5 \text{ tens} = \underline{\hspace{1cm}} \text{ tens} \\
      5 \times 50 = \underline{\hspace{1cm}}
3. Match.

- $6 \times 2$  
- $6 \text{ tens} \times 2$  
- $7 \times 3$  
- $7 \text{ tens} \times 3$  
- $70 \times 5$  
- $3 \times 90$

- $120$  
- $21$  
- $12$  
- $270$  
- $210$  
- $350$

4. Each classroom has 30 desks. Use a tape diagram to find the total number of desks in 8 classrooms.
1. Use the chart to complete the equations. Then solve. The first one has been done for you.

a. \((2 \times 4) \times 10\)
   
   \[= (8 \text{ ones}) \times 10\]
   
   \[= 80\]

b. \(2 \times (4 \times 10)\)
   
   \[= 2 \times (4 \text{ tens})\]
   
   \[= ______\]

c. \((3 \times 5) \times 10\)
   
   \[= (\text{_____ ones}) \times 10\]
   
   \[= ______\]

d. \(3 \times (5 \times 10)\)
   
   \[= 3 \times (\text{_____ tens})\]
   
   \[= ______\]
2. Place ( ) in the equations to find the related fact. Then solve. The first one has been done for you.

\[
2 \times 20 = 2 \times (2 \times 10) \\
= (2 \times 2) \times 10 \\
= 4 \times 10 \\
= 40
\]

\[
2 \times 30 = 2 \times (3 \times 10) \\
= (2 \times 3) \times 10 \\
= 6 \times 10 \\
= 60
\]

\[
3 \times 30 = 3 \times (3 \times 10) \\
= 3 \times 3 \times 10 \\
= 9 \times 10 \\
= 90
\]

\[
2 \times 50 = 2 \times 5 \times 10 \\
= 2 \times 5 \times 10 \\
= 10 \times 10 \\
= 100
\]

3. Gabriella solves \(20 \times 4\) by thinking about \(10 \times 8\). Explain her strategy.
1. Place ( ) in the equations to show how to use the associative property to find the related fact. Then solve.
   a. $4 \times 20 = 4 \times 2 \times 10$  
      $= 4 \times 2 \times 10$  
      $= _____ \times 10$  
      $= _____$
   b. $3 \times 30 = 3 \times 3 \times 10$  
      $= 3 \times 3 \times 10$  
      $= _____ \times 10$  
      $= _____$

2. Jamila solves $20 \times 5$ by thinking about 10 tens. Explain her strategy.
Lesson 20 Homework

1. Use the chart to complete the equations. Then solve.

<table>
<thead>
<tr>
<th>tens</th>
<th>ones</th>
<th>( \times 10 )</th>
</tr>
</thead>
</table>

   a. \((2 \times 5) \times 10\)
      \[= (10 \text{ ones}) \times 10\]
      \[= _____\]

   b. \(2 \times (5 \times 10)\)
      \[= 2 \times (5 \text{ tens})\]
      \[= _____\]

   c. \((4 \times 5) \times 10\)
      \[= (_____ \text{ ones}) \times 10\]
      \[= _____\]

   d. \(4 \times (5 \times 10)\)
      \[= 4 \times (_____ \text{ tens})\]
      \[= _____\]
2. Solve. Place ( ) in (c) and (d) as needed to find the related fact.

a. \[ 3 \times 20 = 3 \times (2 \times 10) \]
   \[ = (3 \times 2) \times 10 \]
   \[ = \underline{6} \times 10 \]
   \[ = \underline{\text{____}} \]

b. \[ 3 \times 30 = 3 \times (3 \times 10) \]
   \[ = (3 \times 3) \times 10 \]
   \[ = \underline{\text{____}} \times 10 \]
   \[ = \underline{\text{____}} \]

c. \[ 3 \times 40 = 3 \times (4 \times 10) \]
   \[ = 3 \times 4 \times 10 \]
   \[ = \underline{\text{____}} \times 10 \]
   \[ = \underline{\text{____}} \]

d. \[ 3 \times 50 = 3 \times 5 \times 10 \]
   \[ = 3 \times 5 \times 10 \]
   \[ = \underline{\text{____}} \times 10 \]
   \[ = \underline{\text{____}} \]

3. Danny solves \(5 \times 20\) by thinking about \(10 \times 10\). Explain his strategy.
Lesson 21: Solve two-step word problems involving multiplying single-digit factors and multiples of 10.

Date: 7/31/13

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$30 \times 6 =$</td>
<td>$9 \times 60 =$</td>
<td>$40 \times 2 =$</td>
<td>$10 \times 6 =$</td>
</tr>
<tr>
<td>$70 \times 3 =$</td>
<td>$50 \times 6 =$</td>
<td>$80 \times 9 =$</td>
<td>$20 \times 5 =$</td>
</tr>
<tr>
<td>$8 \times 30 =$</td>
<td>$3 \times 30 =$</td>
<td>$5 \times 50 =$</td>
<td>$4 \times 40 =$</td>
</tr>
<tr>
<td>$6 \times 80 =$</td>
<td>$70 \times 7 =$</td>
<td>$20 \times 7 =$</td>
<td>$10 \times 7 =$</td>
</tr>
<tr>
<td>$90 \times 7 =$</td>
<td>$2 \times 60 =$</td>
<td>$50 \times 7 =$</td>
<td>$80 \times 5 =$</td>
</tr>
<tr>
<td>$60 \times 6 =$</td>
<td>$9 \times 50 =$</td>
<td>$30 \times 9 =$</td>
<td>$4 \times 80 =$</td>
</tr>
</tbody>
</table>
Lesson 21 Problem Set

Name ___________________________ Date ______________

Directions: Use the RDW process to solve each problem. Use a letter to represent the solution.

1. There are 60 seconds in 1 minute. Use a tape diagram to find the total number of seconds in 5 minutes and 45 seconds.

2. Lupe saves $30 each month for 4 months. Does she have enough money to buy the art supplies below? Explain why or why not.

   Art Supplies
   $142

3. Brad receives 5 cents for each can or bottle he recycles. How many cents does Brad earn if he recycles 48 cans and 32 bottles?
4. A box of 10 markers weighs 105 grams. If the empty box weighs 15 grams, how much does each marker weigh?

5. Mr. Perez buys 3 sets of cards. Each set comes with 18 striped cards and 12 polka dot cards. He uses 49 cards. How many cards does he have left?

6. Ezra earns $9 an hour working at a book store. She works for 7 hours each day on Mondays and Wednesdays. How much does Ezra earn each week?
Lesson 21 Exit Ticket

Name ___________________________ Date ______________________

Directions: Use the RDW process to solve. Use a letter to represent the unknown.

Frederick buys a can of 3 tennis balls. The empty can weighs 20 grams and each tennis ball weighs 60 grams. What is the total weight of the can with 3 tennis balls?
Lesson 21 Homework

Name  ____________________________________________________________________________  Date ________________

Directions: Use the RDW process for each problem. Use a letter to represent the solution.

1. There are 60 minutes in 1 hour. Use a tape diagram to find the total number of minutes in 6 hours and 15 minutes.

2. Ms. Lemus buys 7 boxes of snacks. Each box has 12 packets of fruit snacks and 18 packets of cashews. How many snacks did she buy altogether?

3. Tamara wants to buy a tablet that costs $437. She saves $50 a month for 9 months. Does she have enough money to buy the tablet? Explain why or why not.
4. Mr. Ramirez receives 4 sets of books. Each set has 16 fiction books and 14 non-fiction books. He puts 97 books in his library and donates the rest of his books. How many books does he donate?

5. Celia sells calendars for a fundraiser. Each calendar costs $9. She sells 16 calendars to her family members and 14 calendars to the people in her neighborhood. Her goal is to earn $300. Does Celia reach her goal? Explain your answer.

6. The video store sells science and history movies for $5 each. How much money does the video store make if it sells 33 science movies and 57 history movies?
Name ________________________________ Date ________________

1. The carnival is in town for 21 days. How many weeks is the carnival in town? (There are 7 days in 1 week). Write an equation and solve.

2. There are 48 liters needed to finish filling the dunk tank at the carnival. Each container holds 8 liters. How many containers are needed to finish filling the dunk tank? Represent the problem using multiplication and division sentences and a letter for the unknown. Solve.

   _____ × _____ = ______
   _____ ÷ _____ = ______

3. There are 4 rows of 7 chairs setup for the Magic Show. A worker sees the large number of people lined up and doubles the number of rows of chairs. They are shown below.

   Explain and label to show how the array represents both $8 \times 7$ and $2 \times (4 \times 7)$.
4.

a. Fabrizio wins a bumble-bee doll with 6 stripes. He notices that 5 other children in line for the Magic Show won the same doll. How many stripes are on 6 bumble-bee dolls? Write an equation using a letter to represent the unknown. Solve.

b. The magician uses a magic box. Every time he puts an object in, it gets multiplied. Fabrizio writes down what happens to try and find a pattern. Look at his notes to the right.
   - Use the pattern to fill in the number of bean bags.
   - What does the magic box do? Explain how you know.

<table>
<thead>
<tr>
<th>In</th>
<th>Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Feathers</td>
<td>14 Feathers</td>
</tr>
<tr>
<td>3 Marbles</td>
<td>21 Marbles</td>
</tr>
<tr>
<td>4 Dice</td>
<td>28 Dice</td>
</tr>
<tr>
<td>5 Wands</td>
<td>35 Wands</td>
</tr>
<tr>
<td>6 Bean bags</td>
<td>___ Bean bags</td>
</tr>
</tbody>
</table>

C. The magician puts 12 rings into the magic box. Fabrizio draws a number bond to find the total number of rings that come out. Use the number bond to show how Fabrizio solved the problem.

\[ 12 \times 7 \]

D. After the show, Fabrizio and 5 friends equally share the cost of a $54 magic set. They use the equation \( 6 \times n = 54 \) to figure out how much each person pays. How much does Fabrizio pay?
1. Aunt Korina and her 3 friends decide to share a cab and go to the mall. If they each spent $6, how much did the cab ride cost altogether? Write an equation using a letter to represent the unknown. Solve.

2. Aunt Korina’s 3 friends each order pasta and a lemonade for lunch. Aunt Korina orders only chicken salad.
   a. Use the menu to find how much they spend altogether. Write equations using letters to represent the unknown. Solve.

   b. Aunt Korina mentally checks the total using $9 \times 4$. Explain her strategy.

3. After lunch the friends notice a sale. Compare the crossed out prices to the new sale prices. If all sale prices are calculated in the same way, what would the sale price be on an item that originally cost $24? Use words and equations to explain how you know.
4.

a. A shopkeeper in the bookstore arranges the boxed sets of books as shown to the right. If each box contains 9 books, how many books are there?

- Write equations and solve using a letter to represent the unknown.
- Explain how you know your answer is reasonable.

b. Aunt Korina figures out how many books are in the arrangement. Her work is shown below. Explain Aunt Korina’s strategy.

\[ 10 \times 10 - 10 = 90 \]

c. In the book store, Aunt Korina buys 3 boxes of pens. Each box contains 2 bundles of 10 gray pens. Her friend buys 6 packs of pens. Each pack contains 10 black pens. Explain how the equation below shows how Aunt Korina and her friend buy the same number of pens.

\[ 6 \times 10 = 3 \times 2 \times 10 \]
5. Complete as many problems as you can in 100 seconds. The teacher will time you and tell you when to stop.
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