1. Fill in the blanks to make true statements.

   a. 4 groups of five = __20__
      4 fives = __20__
      4 \times 5 = __20__

   b. 5 groups of four = __20__
      5 fours = __20__
      5 \times 4 = __20__

   c. 6 + 6 + 6 = __18__
      3 groups of six = __18__
      3 \times 6 = __18__

   d. 3 + 3 + 3 + 3 + 3 + 3 = __18__
      6 groups of 3 = __18__
      6 \times 3 = __18__
2. The picture below shows 3 groups of hot dogs. Does the picture below show $3 \times 3$? Explain why or why not.

![Image of 3 groups of hot dogs]

Yes because there are 3 groups of 3 hotdogs

3. Draw a picture to show $4 \times 2 = 8$.

![Image of 4 groups of 2 circles]

4. Circle the markers below to show 3 groups of 6. Write addition and multiplication sentences to represent the problem.

![Image of 3 groups of 6 markers]
Use the arrays below to answer each set of questions.

1.  
   a. How many rows of erasers are there? 3
   b. How many erasers are there in each row? 2

2.  
   a. What is the number of rows? 4
   b. What is the number of objects in each row? 3

3.  
   a. There are 3 squares in each row. How many squares are in 5 rows? 15
   b. Write a multiplication fact to describe the array. $3 \times 5 = 15$

4.  
   a. There are 6 rows of stars. How many stars are in each row? 4
   b. Write a multiplication fact to describe the array. $6 \times 4 = 24$
5. The triangles below show 3 groups of 4.

a. Redraw the triangles as an array that shows 3 rows of 4.

b. Compare the drawing to your array. How are they the same? How are they different?

Same - both have 12 total!
Different - different number of groups and number in each group

6. Roger has a collection of stamps. He arranges the stamps into 5 rows of 4. Draw an array to represent Roger's stamps. Then write a multiplication sentence to describe the array.

\[ 5 \times 4 = 20 \]

7. Kimberly arranges her 18 markers in an array. Draw an array that Kimberly might make. Then write a multiplication sentence to match your array.

Answers may vary:

\[ 6 \times 3 = 18 \]
\[ 9 \times 2 = 18 \]
\[ 1 \times 18 = 18 \]
\[ 2 \times 9 = 18 \]

\[ 3 \times 6 = 18 \]
\[ 18 \times 1 = 18 \]
Solve problems 1–4 using the pictures for each problem.

1. There are 5 pineapples in each group. How many pineapples are there in 5 groups?
   
   a. Number of groups: 5  
   Size of each group: 5
   
   b. \( 5 \times 5 = 25 \)
   
   c. There are 25 pineapples altogether.

2. There are \( \frac{1}{2} \) oranges in each basket. How many oranges are there in 6 baskets?

   a. Number of groups: 6  
   Size of each group: \( \frac{1}{4} \)
   
   b. \( 6 \times \frac{1}{4} = \frac{24}{4} \)
   
   c. There are 24 oranges altogether.
3. There are 4 bananas in each row. How many bananas in ___4___ rows?
   a. Number of rows: ___4___ Size of each row: ___4___
   b. ___4___ \times ___4___ = 16
   c. There are ___16___ bananas altogether.

4. There are ___3___ peppers in each row. How many peppers are there in 6 rows?
   a. Number of rows: ___6___ Size of each row: ___3___
   b. ___6___ \times ___3___ = 18
   c. There are ___18___ peppers altogether.

5. Draw an array using factors 4 and 2. Then show a number bond where each part represents the amount in one row.

   X X
   X X
   X X
   X X
   4 \times 2 = 8

   8
   2 2
   2 2
   2 + 2 + 2 + 2 = 8
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>1.</strong></td>
<td><strong>2.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="Diagram" /></td>
<td><img src="image2" alt="Diagram" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divide 12 chairs into 2 equal groups. There are [5] chairs in each group.</td>
<td>Divide 21 triangles into 3 equal groups. There are [7] triangles in each group.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong></td>
<td><strong>4.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Diagram" /></td>
<td><img src="image4" alt="Diagram" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divide 25 erasers into [5] equal groups. There are [5] erasers in each group.</td>
<td>Divide [9] chickens into [3] equal groups. There are [3] chickens in each group. [9 \div 3 = 3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5.</strong></td>
<td><strong>6.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image5" alt="Diagram" /></td>
<td><img src="image6" alt="Diagram" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are [12] buckets in each group. [12 \div 4 = 3]</td>
<td></td>
<td>16 \div 4 = [4]</td>
<td></td>
</tr>
</tbody>
</table>

**Lesson 4:** Understand the meaning of the unknown as the size of the group in division.

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7. Andrew has 21 keys. He puts them in 3 equal groups. How many keys are in each group?

There are 7 keys in each group.

21 ÷ 3 = 7

8. Mr. Doyle has 20 pencils. He divides them equally between 4 tables. Draw the pencils on each table.

There are 5 pencils on each table.

20 ÷ 4 = 5

9. Jenna has markers. The picture shows how she placed them on her desk. Write a division sentence to represent how she equally grouped her markers.

There are 4 markers in each row.

20 ÷ 5 = 4
1. Divide 4 triangles into groups of 2.

There are 2 groups of 2 triangles.

\[4 \div 2 = 2\]

2. Divide 9 eggs into groups of 3.

There are 3 groups.

\[9 \div 3 = 3\]

3. Divide 12 buckets of paint into groups of 3.

\[12 \div 3 = 4\]

4. Group the squares to show \(15 \div 5 = 3\).

How many groups are there? 3
5. Daniel has 12 apples. He puts 6 apples in each bag. Circle the apples to find the number of bags Daniel makes.

a. Write a division sentence where the answer represents the number of Daniel's bags.

\[ 12 \div 6 = 2 \]

b. Draw a number bond to show Daniel's apples.

6. Jacob is drawing cats. He draws 4 legs on each cat, and a total of 24 legs.

a. Use a count-by to find the number of cats Jacob draws. Make a drawing to match your counting.

\[ 4 \quad 8 \quad 12 \quad 16 \quad 20 \quad 24 \]

b. Write a division sentence to represent the problem.

\[ 24 \div 6 = 4 \]
1. Mr. Hannigan puts 12 pencils into boxes. Each box holds 4 pencils. Circle groups of 4 to show the pencils in each box.

Mr. Hannigan needs \( \frac{3}{3} \) boxes.

\[
\begin{align*}
3 \times 4 &= 12 \\
12 \div 4 &= 3
\end{align*}
\]

2. Mr. Hannigan places 12 pencils into 3 equal groups. Draw to show how many pencils are in each group.

There are \( \frac{4}{4} \) pencils in each group.

\[
\begin{align*}
3 \times \frac{4}{4} &= 12 \\
12 \div 3 &= 4
\end{align*}
\]

3. Use an array to model Problem 1.

\[
\begin{align*}
a) \quad \frac{3}{3} \times 4 &= 12 \\
12 \div 4 &= 3
\end{align*}
\]

The number in the blanks represents: how many boxes (groups) there are.

\[
\begin{align*}
b) \quad 3 \times \frac{4}{4} &= 12 \\
12 \div 3 &= 4
\end{align*}
\]

The number in the blanks represents: how many pencils are in each group.
4. Judy washes 24 dishes. She then dries and stacks the dishes equally into 4 piles. How many dishes are in each pile?

\[ 24 \div 4 = \_ \_ \_ \]

\[ 4 \times \_ \_ \_ = 24 \]

What is the meaning of the unknown factor and quotient?

\[
\text{how many dishes in each pile.}
\]

5. Nate solves the problem \[ \frac{3}{5} \times 5 = 15 \] by writing and solving \[ 15 \div 5 = \frac{3}{5} \]. Explain why Nate’s method works.

3 groups of 5 is 15.

If you divide 15 items into 5 groups, there are 3 in each group because \[ \frac{3}{5} \times 5 = 15 \].

6. The blanks in Problem 5 represent the number of groups. Draw an array to represent the number sentences.

\[
\begin{array}{cccc}
\text{OOOOO} & & & \text{OOO} \\
\text{OOOOO} & & & \text{OOO} \\
\text{OOOOO} & & & \text{OOO} \\
3 \times 5 = 15 & & & 5 \times 3 = 15
\end{array}
\]
1. a. Count by twos 7 times.
   
   \[ 2, 4, 6, 8, 10, 12, 14 \]
   
   b. Draw an array that matches your count-by.
   
   c. Write a multiplication sentence that represents the total number of objects in your array.
   
   \[ 7 \times 2 = 14 \]

2. a. Count by sevens 2 times.
   
   \[ 7, 14 \]
   
   b. Draw an array that matches your count-by.
   
   c. Write a multiplication sentence that represents the total number of objects in your array.
   
   \[ 2 \times 7 = 14 \]

3. a. Compare your work in Problems 1 and 2. Turn your paper as you study the arrays to look at them in different ways.

   "It is the same array. The array in problem 1 just gets turned on its side in problem 2."

   b. Why are the factors in your multiplication sentences in a different order?

   Problem 1 = 7 groups of 2
   Problem 2 = 2 groups of 7

4. Count by the unit (the number in word form) the number of times indicated. Write the multiplication sentence that matches your count-by. The first one is done for you.

   a. 2 twos: \[ 2 \times 2 = 4 \]
   
   d. 2 fours: \[ 2 \times 4 = 8 \]
   
   g. 2 fives: \[ 2 \times 5 = 10 \]
   
   b. 3 twos: \[ 3 \times 2 = 6 \]
   
   e. 4 twos: \[ 4 \times 2 = 8 \]
   
   g. 6 twos: \[ 6 \times 2 = 12 \]
   
   c. 2 threes: \[ 2 \times 3 = 6 \]
   
   f. 5 twos: \[ 5 \times 2 = 10 \]
   
   h. 2 sixes: \[ 2 \times 6 = 12 \]
5. Write and solve a different multiplication sentence to describe each array.

\[ 6 \times 2 = 12 \quad 2 \times 6 = 12 \]

6. Angel writes \( 2 \times 8 = 8 \times 2 \) in his notebook. Do you agree or disagree? Draw arrays to help explain your thinking.

I agree because the arrays have the same amount. Array 2 is just turned on its side.

7. Find the missing factor to make each number sentence true.

\[ 2 \times 6 = 6 \times \_ \quad 7 \times 2 = 2 \times 7 \quad 9 \times 2 = \_ \times 9 \quad 2 \times 10 = 10 \times \_ \]

8. Tamia buys 2 bags of candy. Each bag has 7 pieces of candy in it.
   a. Draw an array to show how many pieces of candy Tamia has altogether.

   \[ \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \]

   b. Write and solve a multiplication sentence to describe the array.

   \[ 2 \times 7 = 14 \]

   c. Use the commutative property to write and solve a different multiplication sentence for the array.

   \[ 7 \times 2 = 14 \]
1. a. Count by threes 6 times.
   \[3, 6, 9, 12, 15, 18\]
   b. Draw an array that matches your count-by.

2. Write multiplication expressions below to represent your arrays in Problems 1 and 2. Use the commutative property to make the equation true.
   \[\frac{10 \times 3}{3 \times 10} = \frac{3}{10} \times \frac{10}{3}\]

3. Count by the unit (the number in word form) the number of times indicated. Write the multiplication sentence that matches your count by. The first one is done for you.
   a. 5 threes: \(5 \times 3 = 15\)
   b. 3 fives: \(3 \times 5 = 15\)
   c. 6 threes: \(6 \times 3 = 18\)
   d. 3 sixes: \(3 \times 6 = 18\)
   e. 7 threes: \(7 \times 3 = 21\)
   f. 3 sevens: \(3 \times 7 = 21\)
   g. 8 threes: \(8 \times 3 = 24\)
   h. 3 nines: \(3 \times 9 = 27\)
   i. 10 threes: \(10 \times 3 = 30\)

4. Find the unknowns that make the number sentences true. Then draw a line between related facts.
   a. \(3 + 3 + 3 + 3 + 3 = 18\)
   b. \(3 \times 5 = 15\)
   c. 8 threes + 1 three = \(27\)
   d. \(3 \times 9 = 27\)
   e. \(18 = 6 \times 3\)
   f. \(15 = 5 \times 3\)
5. Fernando puts 3 pictures on each page of his photo album. He puts pictures on 8 pages.
   a. Use circles to draw an array that represents the total number of pictures in Fernando's photo album.
      
      ![Array Diagram]
      
   b. Use your array to write and solve a multiplication sentence to find Fernando's total number of pictures.
      
      \[ 8 \times 3 = 24 \]
      
      Fernando puts a total number of 24 pictures on the 8 pages.
      
   c. Fernando adds 2 more pages to his book. He puts 3 pictures on each new page. Draw x's to show the new pictures on the array in Part A.
      
   d. Write and solve a multiplication sentence to find the new total number of pictures in Fernando's album.
      
      \[ 10 \times 3 = 30 \]
      
      He puts 30 pictures in all on the 10 pages.

6. Ivania recycles. She gets 3 cents for every can she recycles.
   a. How much money does Ivania make if she recycles 4 cans?
      
      \[ 4 \times 3 \text{¢} = 12 \text{¢} \]
      
   b. How much money does she make if she recycles 7 cans?
      
      \[ 7 \times 3 \text{¢} = 21 \text{¢} \]
1. Dan organizes his star stickers into 3 rows of 4. Irene adds 2 more rows of stickers. Complete the number sentences to describe the total number of stickers in the array.

   a. \((4 + 4 + 4) + (4 + 4) = \_

   b. 3 fours + \_ fours = \_ fours

   c. \(5 \times \frac{4}{1} = \_

This is printed incorrectly. Please change!

2. \(7 \times 2 = \_

3. \(9 \times 3 = \_

\[12 + 2 = \_\]

\[= 14\]

\[7 \times 2 = 14\]

\[= 14\]

\[10 \times 3 = 30\]

\[1 \times 3 = 3\]

\[30 - \_ = 27\]

\[9 \times 3 = 27\]
4. Franklin collects stickers. He organizes his stickers in 5 rows of 4 on his table.

   Draw an array that represents Franklin’s stickers using an x to show each sticker.

   \[ 5 \times 4 = 20 \]

   \[
   \begin{array}{cccc}
   & O & O & O \\
   & O & O & O \\
   \times & \times & \times \\
   \times & \times & \times \\
   \times & \times & \times \\
   \times & \times & \times \\
   \end{array}
   \]

5. Franklin adds 2 more rows. Use circles to show his new stickers on the array in part 3a.

   a. Write and solve a multiplication sentence to represent the circles you added to the array.

   \[ \frac{2}{2} \times 4 = 24 \]

   b. Complete the addition sentence to show how you added the totals of 2 multiplication facts to find Franklin’s total number of stickers.

   \[ 20 + 8 = 28 \]

   c. Complete the unknown to show Franklin’s total number of stickers.

   \[ 7 \times 4 = 28 \]
1. \(6 \times 3 = 18\)
   \[
   \begin{aligned}
   (4 \times 3) &= 12 \\
   (2 \times 3) &= 6 \\
   12 + 6 &= 18 \\
   6 \times 3 &= 18
   \end{aligned}
   \]

2. \(8 \times 2 = 16\)
   \[
   \begin{aligned}
   (4 \times 2) &= 8 \\
   (4 \times 2) &= 8 \\
   (4 \times 2) + (4 \times 2) &= 8 + 8 \\
   8 \times 2 &= 16
   \end{aligned}
   \]
3. Adriana is organizing her books on shelves. She puts 3 books in each row.

a. Use the multiplication sentences on the right to draw arrays to show the books on Adriana's top and bottom shelves.

\[ \begin{array}{c}
\square & \square & \square \\
\square & \square & \square \\
\square & \square & \square \\
\square & \square & \square \\
\square & \square & \square \\
\end{array} \]

\[ 5 \times 3 = 15 \]

\[ \begin{array}{c}
\square & \square & \square \\
\end{array} \]

\[ 1 \times 3 = 3 \]

b. Adriana calculates the total number of books as shown below. Use the array you drew to help explain her calculation.

\[ 6 \times 3 = 15 + 3 = 18 \]

The whole array shows 6 rows times 3 columns, so, \( 6 \times 3 \). This was broken into two smaller facts: \( 5 \times 3 = 15 \) and \( 1 \times 3 = 3 \). So we did \( 15 + 3 \) because \( 6 \times 3 = 15 + 3 \). Then \( 6 \times 3 = 18 \) and \( 15 + 3 = 18 \).

\[ 6 \times 3 = 15 + 3 = 18 \]
1. Fred has 10 pears. He puts 2 pears in each basket.
   
   a. Draw an array where each column represents a basket of pears.

   ![Array of 5 baskets, each containing 2 pears]

   \[10 \div 2 = 5\]

   b. Redraw the pears in each basket as a unit in the tape diagram. Label the diagram with known and unknown information from the problem.

   ![Tape diagram with 2 pears per basket and 10 pears total]

2. Ms. Meyer organizes 15 clipboards equally into 3 boxes. How many clipboards are in each box? Model the problem with both an array and a labeled tape diagram. Show each column as the number of clipboards in each box.

   ![Array of 3 columns with 5 clipboards each]

   ![Tape diagram with 15 clipboards, 5 clipboards in each of 3 boxes]

   There are 5 clipboards in each box.
3. Sixteen action figures are arranged equally on 2 shelves. How many action figures are on each shelf? Model the problem with both an array and a labeled tape diagram. Show each column as the number of action figures on each shelf.

4. Jasmine puts 18 hats away. She puts an equal number of hats on 3 shelves. How many hats are on each shelf? Model the problem with both an array and a labeled tape diagram. Show each column as the number of hats on each shelf.

5. Corey checks out 2 books a week from the library. How many weeks will it take him to check out a total of 14 books?
1. 10 people wait in line for the roller coaster. 2 people sit in each car. Find the total number of cars needed.

\[
\frac{10}{2} = 5
\]

There are 5 cars needed.

2. Mr. Ramirez divides 12 frogs equally into 6 groups for students to study. How many frogs are in each group? Label known and unknown information on the tape diagram to help you solve.

There are \( \frac{12}{6} = 2 \) frogs in each group.

3. Match.

- \( 10 \div 2 = 5 \)
- \( 16 \div 2 = 8 \)
- \( 18 \div 2 = 9 \)
- \( 14 \div 2 = 7 \)
4. Betsy pours 16 cups of water to equally fill 2 bottles. How many cups of water are in each bottle? Label the tape diagram to represent the problem, including the unknown.

There are \( \frac{16}{2} \) cups of water in each bottle.

5. An earthworm tunnels 2 cm into the ground each day. The earthworm tunnels at about the same pace every day. How many days will it take the earthworm to tunnel 14 cm?

7 days

6. Sebastian and Teshawn go to the movies. The tickets cost $16 in total. The boys share the cost equally. How much does Teshawn pay?

$8.00