Multiplication as Repeated Addition

Complete.

1. \[ \begin{array}{l}
\bullet \bullet \bullet \\
\bullet \bullet \bullet \\
\bullet \bullet \bullet \\
\bullet \bullet \bullet \\
\end{array} \]

2 groups of ____ 2. \[ \begin{array}{l}
\bullet \bullet \bullet \\
\bullet \bullet \bullet \\
\bullet \bullet \bullet \\
\bullet \bullet \bullet \\
\end{array} \]

3 groups of ____

5 + ____ = ____ 4 + ____ + ____ = ____

2 \times ____ = ____ 3 \times ____ = ____

3. \[ 4 + 4 + 4 + 4 + 4 = 5 \times ____ \]

4. \[ ____ + ____ + ____ = 3 \times 8 \]

5. \[ 9 + ____ + ____ = ____ \times 9 \]

6. \[ 7 + 7 + 7 + 7 = ____ \times ____ \]

Write +, −, or \( \times \) for each \( \square \).

7. \[ \begin{array}{c}
5 \square 4 = 9 \\
7 \square 3 = 4 \\
8 \square 2 = 12 \\
3 \square 3 = 9 \\
6 \square 6 = 2 \\
8 \square 6 = 2 \\
11 \square 3 = 6 \\
12 \square 3 = 6 \\
\end{array} \]

13. **Reason** Marlon has 4 cards, Jake has 4 cards, and Sam has 3 cards. Can you write a multiplication sentence to find how many cards they have in all? Explain.

14. **Write a Problem** Draw a picture that shows equal groups. Then write an addition sentence and a multiplication sentence for your picture.

15. Which is equal to \( 6 + 6 + 6 + 6 \)?

   A 6 × 3  
   B 3 × 6  
   C 4 × 6  
   D 6 × 5
Arrays and Multiplication

Write a multiplication sentence for each array.

1. 

2. 

3. 

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

Draw an array to show each multiplication fact. Write the product.

4. \[ 2 \times 8 = \_]  
5. \[ 3 \times 6 = \_ \]

6. **Model** Paula arranged her stamps in an album. The album has 3 rows with 7 stamps in each row. How many stamps does Paula have? Draw an array to solve your problem.

7. Jonathan is arranging 36 pictures, with 9 pictures in each row. How many rows will there be?
   
   A 9  
   B 5  
   C 4  
   D 2
The Commutative Property

Write a multiplication sentence for each array.

1. 2. 3.

Draw an array to find each multiplication fact. Write the product.

4. 6. 9.

Complete each multiplication sentence. Use counters or draw an array to help.

6. 3 × ____ = 21 7. 4 × 9 = ____ 8. 5 × 6 = ____

9. 4 × 7 = ____ 10. 6 × 8 = ____ 11. 9 × 5 = ____

12. Explain It If you know that 7 × 8 = 56, how can you use the Commutative (Order) Property of Multiplication to find the product of 8 × 7?

13. Which of the following is equal to 8 × 4?

A 4 × 8  B 4 + 8  C 8 − 4  D 8 + 4
Writing Multiplication Stories

Write a multiplication story for each.

Draw a picture to find each product.

1. \(3 \times 6\)  
2. \(2 \times 8\)  
3. \(4 \times 3\)

Write a multiplication story for each picture.

4.  
5.  

6. **Model** Hot dog buns come in packages of 8. Mrs. Wilson has a total of 40 hot dog buns. Draw a picture to find how many packages of hot dog buns Mrs. Wilson has.

7. There are 9 players on a baseball team. At the park, 4 teams are playing. How many baseball players are playing at the park?
   
   A  27  
   B  32  
   C  36  
   D  40
Problem Solving: Writing to Explain

1. Look at the numbers below. 13, 15, 19, 25, …
   a. Describe the pattern.

   ___________________________________________________________

   ___________________________________________________________

   ___________________________________________________________

   b. Explain how you can find the next two numbers. What are the next two numbers?

   ___________________________________________________________

   ___________________________________________________________

   ___________________________________________________________

2. Mr. Wilson is setting up volleyball teams. There are 6 players on a team.
   a. Complete the table below.

<table>
<thead>
<tr>
<th>Teams</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Players</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   b. Explain how the number of players changes as the number of teams changes.

   ___________________________________________________________

   ___________________________________________________________

   ___________________________________________________________

3. Look for Patterns The table below shows the amount of money that Louise earns in allowance each week.
   a. Complete the table.

<table>
<thead>
<tr>
<th>Louise's Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Weeks</td>
</tr>
<tr>
<td>Allowance</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

   b. How did the table help you to find the pattern?

   ___________________________________________________________

   ___________________________________________________________

   ___________________________________________________________

4. Diana is training to run a race.
   a. Complete the table for Diana's first week of training.

<table>
<thead>
<tr>
<th>Diana's Training Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
</tbody>
</table>

   b. If she continues the pattern, for how many minutes will Diana run on Saturday?

   ___________________________________________________________
Choose the best answer.

1. Which has the same value as $5 \times 4$? (4-1)
   
   A $5 + 4$
   
   B $4 + 4 + 4 + 4$
   
   C $5 + 5 + 5 + 5 + 5$
   
   D $4 + 4 + 4 + 4 + 4$

2. Ken set up his pieces on the checker board as shown below. Which number sentence would find how many checker pieces Ken put on the checker board? (4-2)

   ![Checker Board Diagram]

   A $8 + 3 = \square$
   
   B $3 \times 8 = \square$
   
   C $3 + 8 = \square$
   
   D $8 - 3 = \square$

3. Which story could be solved with $3 \times 9$? (4-4)

   A Lin bought 3 bags of oranges. Each bag had 9 oranges. How many oranges did Lin buy?
   
   B Sal has 3 red blocks and 9 green blocks. How many blocks does Sal have in all?
   
   C Ari has 9 baby carrots to eat. He has eaten 3 of them. How many does he have left?
   
   D Luz has 3 pages in her album. She has 9 stickers. How many stickers can she put on each page?

4. Which number makes the second number sentence true? (4-3)

   $8 \times 4 = 32$
   
   A 32
   
   B 12
   
   C 8
   
   D 4
5. Which is a multiplication sentence for this repeated addition? (4-1)

\[ 9 + 9 + 9 + 9 + 9 + 9 + 9 \]

A  \( 5 \times 9 \)
B  \( 6 \times 9 \)
C  \( 7 \times 9 \)
D  \( 9 \times 9 \)

6. Ashanti is buying balloons for a party. Each package has 6 balloons. How does the number of balloons change as the number of packages increase by 1? (4-5)

<table>
<thead>
<tr>
<th>Packages</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balloons</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td>24</td>
<td>30</td>
</tr>
</tbody>
</table>

A  There are 30 more balloons for each additional package.
B  There are 30 fewer balloons for each additional package.
C  There are 6 more balloons for each additional package.
D  There are 6 fewer balloons for each additional package.

7. Write a repeated addition sentence for \( 6 \times 3 \). (4-1)

\[ 3 + 3 + 3 + 3 + 3 + 3 = 18 \]

8. Renee made a poster of leaves she collected and arranged them in the pattern shown. Write a number sentence that best shows how she displayed the leaves. (4-2)

\[ 4 \times 5 = 20 \]

9. Write a story that could be solved with \( 5 \times 8 \). (4-4)

Answers will vary. Check students’ work

10. Meagan has a new sticker book. She fills the book with a \( 4 \times 3 \) array of stickers. How many stickers does Meagan have in all? (4-2)

\[ 12 \]
11. How can knowing that \(7 \times 15 = 105\) help you find the answer to \(15 \times 7\) ? Explain. (4-3) **Use Commutative Property of Multiplication.** If \(7 \times 15 = 105\), then \(15 \times 7 = 105\).

12. Complete the number sentence. (4-1) 
\[
3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = \square \times 3
\]
Answer: 9

13. Madison works at the museum for 6 months. If her work hours continue in this pattern, how many hours will she work in June? Explain. (4-5)

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>10</td>
</tr>
<tr>
<td>February</td>
<td>20</td>
</tr>
<tr>
<td>March</td>
<td>30</td>
</tr>
<tr>
<td>April</td>
<td>40</td>
</tr>
<tr>
<td>May</td>
<td>50</td>
</tr>
<tr>
<td>June</td>
<td>60</td>
</tr>
</tbody>
</table>

Total: 60 hours; Sample answer: I used the pattern “add 10 hours for each month”.

14. Which number makes the number sentence true? (4-3)
\[
5 \times 6 = 30 \\
6 \times \square = 30
\]
Answer: 5

15. Can you write \(3 + 4 + 5 = 12\) as a multiplication sentence? Explain. (4-4) **No. The groups are not equal.**

16. Molly collected shells at the beach and arranged them in 4 rows. She put 6 shells in each row. How many shells did Molly have in all? (4-2) **24 shells**

17. Stanley has 3 packages of markers. There are 8 markers in each package. Write and solve a multiplication sentence to find how many markers Stanley has. (4-4)
\[
3 \times 8 = 24, \\
24 markers
\]

18. Petra earns $2 setting the table and $4 for washing dishes. How much will Petra earn if she sets the table and washes the dishes 3 times each? Explain how you can find the answer using a table. (4-5)

<table>
<thead>
<tr>
<th>Setting the Table</th>
<th>$2</th>
<th>$4</th>
<th>$6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing Dishes</td>
<td>$4</td>
<td>$8</td>
<td>$12</td>
</tr>
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Total: $18; Check students’ answers
Choose the best answer.

1. Which has the same value as \(5 \times 4\)? (4-1)
   - A \(5 + 4\)
   - B \(4 + 4 + 4 + 4\)
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<tbody>
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