Practice Lesson 7 Multiples and Factors

Study the example showing multiplication and division facts in a fact family. Then solve problems 1–6.

Example
Write the missing number in the multiplication fact.

\[ 5 \times \_ = 35 \]

Write 7 jumps of 5.

\[ \begin{array}{c|c|c|c|c|c|c} 0 & 5 & 10 & 15 & 20 & 25 & 30 \\ \hline \end{array} \]

\[ \begin{array}{c|c|c|c|c|c|c} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline \end{array} \]

Write the multiplication and division facts in the fact family.

\[ 5 \times 7 = 35 \quad 7 \times 5 = 35 \quad 35 \div 7 = 5 \quad 35 \div 5 = 7 \]

Prerequisite: Use Fact Families

Solve.

M 3 Write the multiplication and division facts for the fact family with the numbers 5, 6, and 30.

\[
\begin{align*}
5 \times 6 &= 30 \\
6 \times 5 &= 30 \\
30 \div 5 &= 6 \\
30 \div 6 &= 5
\end{align*}
\]

M 4 What two multiplication facts can you use to solve \( \square \times 9 = 72 \)?

\[
\begin{align*}
7 \times 9 &= 63 \\
9 \times 7 &= 63
\end{align*}
\]

M 5 Look at the multiplication and division facts below. Are they a fact family? Explain.

\[
\begin{align*}
4 \times 6 &= 24 \\
24 \div 3 &= 8 \\
24 \div 6 &= 4 \\
8 &= 24 \div 3
\end{align*}
\]

No; Possible explanation: The facts are not a fact family because they have 5 different numbers: 3, 4, 6, 8, and 24. A fact family has only 3 numbers.

C 8 Complete each fact family. Use the numbers in the tiles below to fill in each box. You may use some tiles more than once.

\[
\begin{align*}
2 \times 9 &= 18 \\
9 \times 2 &= 18 \\
18 \div 9 &= 2 \\
18 \div 2 &= 9 \\
4 \times 6 &= 24 \\
6 \div 6 &= 6
\end{align*}
\]

Key

B Basic \quad M Medium \quad C Challenge
Solve.

Max ordered 72 mugs. Mugs are packed 8 to a box. How many boxes of mugs did Max order?

Choose Yes or No to indicate whether the equation or statement could be used to solve the problem above.

a. \( 72 = 8 \times b \)  
   \( \bigcirc \) Yes  \( \bigcirc \) No

b. \( 72 - 8 = b \)  
   \( \bigcirc \) Yes  \( \bigcirc \) No

c. List multiples of 8:  
   8, 16, 24, 32, 40, ...
   \( \bigcirc \) Yes  \( \bigcirc \) No

d. \( b = \frac{72}{8} \)  
   \( \bigcirc \) Yes  \( \bigcirc \) No

Cupcakes are packed 6 to a box. If Abby only buys full boxes of cupcakes, give two possible numbers of cupcakes that she could buy.

Show your work.

Possible answer: 6 \( \times \) 2 = 12; 6 \( \times \) 3 = 18

Solution: Abby could buy 12 cupcakes or 18 cupcakes.

Strawberries are sold in 1-pound, 2-pound, and 5-pound boxes. Stacy wants to buy exactly 10 pounds of strawberries. What are two ways that Stacy could buy exactly 10 pounds of strawberries? Tell which sizes of boxes she could buy and how many of each size box.

Show your work.

Solution: Answers will vary. Possible answer: Stacy could buy 10 1-pound boxes or 2 5-pound boxes. 1 \( \times \) 10 = 10; 2 \( \times \) 5 = 10.
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Solve.

8 Tell whether each sentence about the factors of 18 is True or False.

a. All the factors of 18 are 2, 3, 6, 9, 18. □ True □ False

b. 1 and 18 are a factor pair. □ True □ False

c. 180 is a factor because 10 × 18 = 180. □ True □ False

d. An array showing the factor pair of 3 and 6 would have 3 rows of 6 objects. □ True □ False

5 Carlos arranged his building blocks into 2 rows of 12 blocks. Liz arranged her blocks into 6 rows of 4 blocks. If they each use the same number of blocks, what two other ways could they arrange their blocks?

Show your work.
Possible work: Carlos and Liz both used 24 blocks. Carlos: 2 × 12 = 24; Liz: 6 × 4 = 24. Other ways to arrange 24 blocks are 1 × 24 = 24 and 3 × 8 = 24.

Solution: They could arrange the blocks in 1 row of 24 blocks or 3 rows of 8 blocks.

.Unit 2 Operations and Algebraic Thinking

Find Factors and Factor Pairs

Study the example problem about factors and factor pairs. Then solve problems 1–6.

Example

Mr. Kennedy is arranging the 16 chairs in his classroom for a presentation. He wants to put the chairs in rows with an equal number of chairs in each row. Find all the ways he can arrange the chairs.

Factors of 16: 1, 2, 4, 8, 16.

Factor pairs: 1 and 16, 2 and 8, 4 and 4.

Mr. Kennedy can arrange the chairs in 5 ways.

B 1 Complete the list to show the factors of 12.

1, 2, 3, 4, 6, 12.

B 2 Write the factor pairs of 12.

1, 12; 2 and 6; 3 and 4

B 3 The 20 students in Amanda’s class each carved a wooden plate to display on the wall. They want each row to have the same number of plates. Find all the ways to display the plates.

Show your work.
Possible work: 1 × 20, 2 × 10, 4 × 5, 5 × 4.

Solution: 1 row of 20, 2 rows of 10, 4 rows of 5, 5 rows of 4, 10 rows of 2, and 20 rows of 1.

Vocabulary

factor pair Two numbers that are multiplied together to give a product.

Jonah has 100 flowers to arrange into vases. He wants to put the same number of flowers in each vase. List the factor pairs of 100. Then complete the table to show the different ways to arrange the flowers.

Factor pairs of 100: 1 and 100, 2 and 50, 4 and 25, 5 and 20, 10 and 10

<table>
<thead>
<tr>
<th>Number of vases</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>25</th>
<th>50</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of flowers in each vase</td>
<td>100</td>
<td>50</td>
<td>25</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Identify Prime and Composite Numbers

Tell whether each sentence is True or False.

a. The number 9 is prime. □ True □ False

b. 2 is the only even prime number. □ True □ False

c. All the odd numbers between 1 and 10 are prime. □ True □ False

d. Some composite numbers have only two factors. □ True □ False

Solve.

5. The area of a garden is 5 square feet.

The dimensions of the garden are 1 foot and 5 feet. 1 and 5 are factors of the number 5.

a. Is the number 5 a prime number? □ Yes □ No

b. If the area of a garden is 15 square feet, what could be the dimensions of the garden?

The dimensions could be 1 foot and 15 feet.

6. Jordan and Mitchell are planning a graduation party with 45 guests. They want to seat an equal number of guests at each table. Each table should have more than one guest.

a. List the different ways the guests and tables could be arranged. Tell how many tables are needed for each group of guests.

1 table of 45 guests; 5 tables of 9 guests; 9 tables of 5 guests

b. Jordan and Mitchell forgot to include themselves in the seating. They still want to have an equal number of guests at each table. List the ways the guests and tables could be arranged now.

1 table of 47 guests is the only way because 47 is prime; it only has the factors 1 and 47.

Vocabulary

prime number a number that has only one pair of factors: itself and 1.

composite number a number that has more than one pair of factors.
There are 56 fourth graders going on a field trip. The teacher wants to divide them evenly into groups of at least 4 students and no more than 8 students. What are the ways to divide the students evenly into groups?

Show your work.

Solution: __________________________________________________________

Solve.

If \( n \) is any number, what is one factor pair that you know \( n \) has?

Solution: ___________________________ 

Look at each number sentence below. Tell whether the circled number is a factor or multiple.

a. \( 1 \times 3 = 3 \) factor \( \times \) multiple
b. \( 4 \times 1 = 4 \) factor \( \times \) multiple
c. \( 3 \times 1 = 3 \) factor \( \times \) multiple
d. \( 5 \times 1 = 5 \) factor \( \times \) multiple

All numbers have 1 as a factor. What is the greatest factor any number can have?

Possible work:

Factors of 6: 1, 2, 3, 6. Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30. Both 6 and 30 have factors of 1, 2, 3, and 6.

Which number also has 6 as a factor?

A 5  \( \times \) C 20
B 10  \( \times \) D 30

Mike chose D as the correct answer. How did he get that answer?

Answers will vary. Possible answer: Factors of 6: 1, 2, 3, 6. Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30. Both 6 and 30 have factors of 1, 2, 3, and 6.

There are 56 fourth graders going on a field trip. The teacher wants to divide them evenly into groups of at least 4 students and no more than 8 students. What are the ways to divide the students evenly into groups?

Show your work.

Possible work:

56 \( \times \) 1 = 56
2 \( \times \) 28 = 56
4 \( \times \) 14 = 56
7 \( \times \) 8 = 56

Only 4 \( \times \) 14, 7 \( \times \) 8, and 8 \( \times \) 7 meet the criteria.

Solution: 14 groups of 4, 7 groups of 8, and 8 groups of 7.