Objective Common Factors and Common Multiples

Warm-Up

Find the greatest common factor of the two numbers shown.

Hint

Common Factors

$$56 = 2 \cdot 2 \cdot 2 \cdot 7$$
$$42 = 2 \cdot 3 \cdot 7$$

Greatest Common Factors   **2 × 7**

14

1.
  12   26
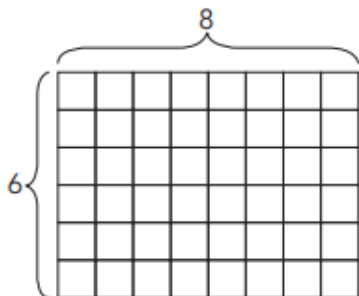
2.
  30   40

12:
26:

30:
40:

Rectangular arrays can also be used to determine multiples and common multiples.

Consider the area model for 6 · 8 = 48.

One way to think about the area model is to analyze the collection of columns. As you look at how the area model builds from left to right, the addition of each new column creates a multiple of 6. So, column 1 alone is a 6 × 1 rectangle, which represents the first multiple of 6, which is 6. By adding column 2, the rectangle is now 6 × 2, which represents the second multiple of 6, which is 12. The whole rectangle represents 6 × 8, or 48.

1. Complete the table so you can list the first eight multiples of 6 by labeling each column of the area model. (Multiply the 6 by each value on top of box and fill the space)

1	2	3	4	5	6	7	8
6:							

Next, think about the area model as a collection of 6 rows. The first row alone creates an 8 × 1 rectangle, which represents the first multiple of 8, which is 8. Including all rows of the 8 × 6 rectangle represents the sixth multiple of 8, which is 48.

2. Complete the table so you can list the first six multiples of 8 by labeling each row of the area model. (Multiply the 6 by each value on top of box and fill the space)

1	2	3	4	5	6
8:					

While 48 is a multiple shared by both 6 and 8, it is not the **least common multiple (LCM)**. The LCM is the smallest multiple (other than zero) that two or more numbers have in common.

3. Analyze the multiples of 6 and 8 from question 1 and 2. Identify the least common multiple of 6 and 8.

4. Determine the least common multiple of 6 and 9.

a. List the first 9 multiples of 6.

	1	2	3	4	5	6	7	8	9
6:									

b. List the first 6 multiples of 9.

	1	2	3	4	5	6
9:						

c. What is the least common multiple of 6 and 9?

5. Use the same strategy practiced to determine the least common multiple of 7 and 8.

Bringing It Back Around

Answer each question to show how to use the Distributive Property to decompose numbers.

1. Consider the sum 36 + 24.

a. Express the sum 36 + 24 as many ways as possible as the product a(b + c).

2. Suppose you have a composite figure composed of a rectangle and another parallelogram with a shared side. The area of the rectangle is 72 square centimeters and the area of the parallelogram is 84 square centimeters.

Explain how to use factors and multiples to determine all possible dimensions a, b, and h for the figure.
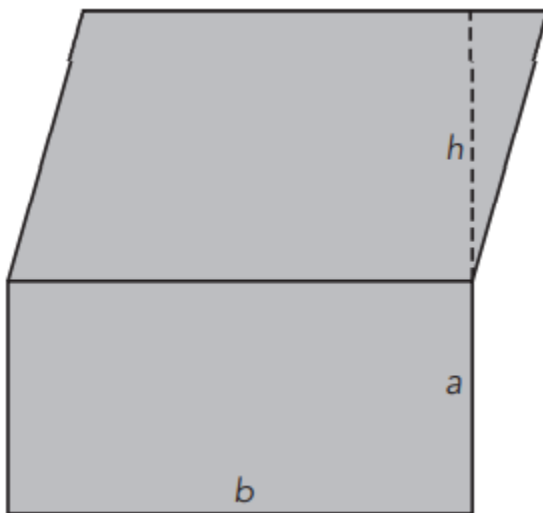
LESSON 1.4b
Common Ground

Objective   Common Factors and Common Multiples

Practice

1. Consider the numbers 18 and 30.
a. List all of the factors of 18.

b. List all of the factors of 30.

c. What factors do 18 and 30 have in common?

d. What is the greatest common factor of 18 and 30?

2. Consider the numbers 54 and 72.
a. Complete a prime factorization of 54 and write it as a product of primes.

b. Complete a prime factorization of 72 and write it as a product of primes.

c. Put the prime factors of 54 and 72 into a table.

d. What are the common factors of 54 and 72?

e. What is the greatest common factor of 54 and 72?

3. For each pair of numbers, determine the least common multiple and at least one other common multiple.
a. 3 and 5   b. 4 and 6   c. 8 and 12