Lesson 4-8

Example 1 Find the LCM by Listing Multiples
Find the LCM of 8 and 12.

Method 1 List the nonzero multiples.
multiples of 8: 8, 16, 24, 32, 40, 48, …
multiples of 12: 12, 24, 36, 48, 60, …

Notice that 24 and 48 are common multiples. The least of these is 24, so, the LCM of 8 and 12 is 24.

Method 2 Use prime factorization.
$8 = 2 \cdot 2 \cdot 2$
$12 = 2 \cdot 2 \cdot 3$

The prime factors of 8 and 12 are 2 and 3. The LCM is the least product that contains the prime factors of each number. So, multiply the greatest power of 2 and 3. The LCM of 8 and 12 is $2 \cdot 2 \cdot 2 \cdot 3$ or 24.

So, the LCM of 8 and 12 is 24.

Example 2 Find the LCM
Find the LCM of 30 and 45.

Write the prime factorizations of 30 and 45.
$30 = 2 \cdot 3 \cdot 5$
$45 = 3 \cdot 3 \cdot 5$

The prime factors of 30 and 45 are 2, 3, and 5. Multiply the greatest power of 2, 3, and 5. The LCM of 30 and 45 is $2 \cdot 3^2 \cdot 5$, or 90.

Example 3 Solve a Problem Using LCM
FRUIT Laura wants to buy apples, pears, and oranges. Apples are sold in bags of 15, pears are sold in packages of 12, and oranges are sold in crates of 24. If she wants to have the same number of apples, pears, and oranges, what is the least number of bags, packages, and crates Laura will need to buy?

First, find the LCM of 15, 12, and 24.

$15 = 3 \cdot 5$
$12 = 2 \cdot 2 \cdot 3$ or $2^2 \cdot 3$
$24 = 2 \cdot 2 \cdot 2 \cdot 3$ or $2^3 \cdot 3$

The LCM of 15, 12, and 24 is $2^3 \cdot 3 \cdot 5$ or 120.

To find the number of bags, packages, and crates of each fruit Laura needs to buy, divide 120 by the amount in each.

apples: $120 \div 15 = 8$ bags
pears: $120 \div 12 = 10$ packages
oranges: $120 \div 24 = 5$ crates

So, Laura will need to buy 8 bags of apples, 10 packages of pears, and 5 crates of oranges.