Chapter 5

MULTIPLES AND LEAST COMMON MULTIPLE

When we multiply a number by any whole number (that isn't 0), the product is a **MULTIPLE** of that number. Every number has an infinite list of multiples.

EXAMPLE: What are the multiples of 4?

$4 \times 1 = 4$
$4 \times 2 = 8$
$4 \times 3 = 12$
$4 \times 4 = 16$
and so on...forever!

The multiples of 4 are 4, 8, 12, 16...

Any multiples that are the same for two (or more) numbers are called **COMMON MULTIPLES**.

EXAMPLE: What are the multiples of 2 and 5?
The multiples of 2 are 2, 4, 6, 8, 10, 12, 14, 16, 18, 20...
The multiples of 5 are 5, 10, 15, 20...

Up until this point, 2 and 5 have the multiples 10 and 20 in common.

What is the smallest multiple that both 2 and 5 have in common? The smallest multiple is 10. We call this the **LEAST COMMON MULTIPLE**, or **LCM**.

To find the LCM of two or more numbers, list the multiples of each number in order from least to greatest until you find the first multiple they both have in common.

EXAMPLE: Find the LCM of 9 and 11.
The multiples of 9 are 9, 18, 27, 36, 45, 54, 63, 72, 81, 99, 108...
The multiples of 11 are 11, 22, 33, 44, 55, 66, 77, 88, 99, 110...

99 is the first multiple 9 and 11 have in common, so the LCM of 9 and 11 is 99.

Sometimes, it's easier to start with the bigger number. Instead of listing all of the multiples of 9 first, start with the multiples of 11, and ask yourself, "Which of these numbers is divisible by 9?"

EXAMPLE: Susie signs up to volunteer at the animal shelter every 6 days. Luisa signs up to volunteer at the shelter every 5 days. If they both sign up to volunteer on the same day, when is the first day that Susie and Luisa will work together?

THIS IS THE SAME AS SAYING, "FIND THE LCM FOR 5 AND 6."

Susie will work on the following days: 6th, 12th, 18th, 24th, and 30th...

30 is the first number divisible by 5, so the LCM is 30.

The first day that Susie and Luisa will work together is on the 30th day.

CHECK YOUR KNOWLEDGE

1. List the first five multiples of 3.

2. List the first five multiples of 12.

3. Find the LCM of 5 and 7.

4. Find the LCM of 10 and 11.

5. Find the LCM of 4 and 6.

6. Find the LCM of 12 and 15.

7. Find the LCM of 18 and 36.

8. Kirk goes to the gym every 3 days. Deshawn goes to the gym every 4 days. If they join the gym on the same day, when is the first day that they'll be at the gym together?

9. Betty and Jane have the same number of coins. Betty sorts her coins in groups of 6, with no coins left over. Jane sorts her coins in groups of 8, with no coins left over. What is the least possible number of coins that each of them has?

10. Bob and Julia have the same number of flowers. Bob sorts his flowers in bouquets of 3, with no flowers left over. Julie sorts her flowers in bouquets of 7, with no flowers left over. What is the least possible number of flowers that each of them has?

CHECK YOUR ANSWERS

1. 3, 6, 9, 12, 15
2. 12, 24, 36, 48, 60
3. 35
4. 110
5. 12
6. 60
7. 36
8. On the 12th day
9. 24 coins
10. 21 bouquets