Least Common Multiples

It might sound contradictory, but the **Least Common Multiple** between two numbers or among 3 or more numbers is always larger than the numbers you start with! When we see the word "least," we think "small"; however, we have to remember that "multiples" are made by "multiplication." (A multiple is the result of multiplying a smaller number by some value.) In the following example, we will consider the **Common Multiples** among 8, 12, and 20. Multiples are found by multiplying each of these starting numbers by the counting numbers, starting with 2. We don't start with 1 because anything multiplied times 1 is just itself!

8 – 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, **120**
12 – 24, 36, 48, 60, 72, 84, 96, 108, **120**
20 – 40, 60, 80, 100, **120**

Okay, so we have just listed out the **multiples** of the three starting numbers above. Now, in order to find the **common multiples**, we simply take note of which number(s) **all 3 starting numbers share**. Since the only number that 8, 12, and 20 share as a multiple is **120**, this is the only **common multiple** in the listing. Also, since we are trying to find the **Least Common Multiple**, we are wanting to find the **First Common Multiple** as we work from left to right. Because 120 was our only common multiple that we found so far, we don't need to keep going. We can stop, because **120 is our First and Least Common Multiple of 8, 12, and 20**.

Let's do another easier one. Consider the following three starting numbers: 4, 8, and 10, and let's find their **least common multiple**. First, we write out our numbers in a column. Then, to the right of each number, we right the answers to that number multiplied times each of the counting numbers until we see all the counting numbers share a multiple.

4 – 8, 12, 16, 20, 24, 28, 32, 36, **40**
8 – 16, 24, 32, **40**
10 – 20, 30, **40**

Since all three of the starting numbers share 40 as their first multiple, **40 is our Least Common Multiple** in this problem!