

The Least Common Multiple (LCM)

A **multiple** of a whole number n is any of the numbers $n, 2n, 3n, 4n, 5n$ and so on. In other words, a whole number times the number n is a multiple of n .

Example 1. The multiples of 9 are 9, 18, 27, 36, 45, 54, 63 and so on.

When we have two or more whole numbers, we can find their **least common multiple**.

As in the case of the greatest common factor, the term “least common multiple” itself tells us what it is! Read it again: least common multiple. All we need to do (in principle) is to find the multiples of the numbers, then find the common multiples, and lastly choose the one that is the least, or the smallest.

Example 2. Find the least common multiple of 5 and 8.

- The multiples of 5 are: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, ... 80,...
- The multiples of 8 are: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, ...

Among these multiples we find the common multiples 40 and 80. There are others as well, such as 120, 160 and so on, but 40 is the least (smallest) common multiple of 5 and 8.

Also, 40 is $5 \cdot 8$. Note: $a \cdot b$ is *always* a common multiple of both a and b , but it is not always the *least* common multiple.

Example 3. Find the least common multiple of 4 and 6.

- The multiples of 4 are: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, ...
- The multiples of 6 are: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, ...

Among these, we find the common multiples 12, 24 and 36. The *least* common multiple (LCM) is 12.

Note that the LCM of 4 and 6 is *not* $4 \cdot 6$.

1. Find the LCM of these numbers.

a. 2 and 6	b. 6 and 9
c. 14 and 8	d. 3 and 8
e. 7 and 10	f. 10 and 15

2. a. List four multiples of 6 that are less than 100.

b. What is the biggest multiple of 4 that is less than 100?

c. What is the smallest multiple of 250 that is more than 1,000?