

[See this page in the course material.](#)

Learning Outcomes

- Find the least common multiple of two numbers by listing multiples
- Find the least common multiple of two numbers by prime factorization

One of the reasons we find multiples and primes is to use them to find the least common multiple of two numbers. This will be useful when we add and subtract fractions with different denominators.

Listing Multiples Method

A common multiple of two numbers is a number that is a multiple of both numbers. Suppose we want to find common multiples of 10 and 25 . We can list the first several multiples of each number. Then we look for multiples that are common to both lists—these are the common multiples.

10	:	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110	...	
25	:	25, 50, 75, 100, 125	...	

We see that 50 and 100 appear in both lists. They are common multiples of 10 and 25 . We would find more common multiples if we continued the list of multiples for each.

The smallest number that is a multiple of two numbers is called the least common multiple (LCM). So the least LCM of 10 and 25 is 50 .

Find the least common multiple (LCM) of two numbers by listing multiples

1. List the first several multiples of each number.
2. Look for multiples common to both lists. If there are no common multiples in the lists, write out additional multiples for each number.
3. Look for the smallest number that is common to both lists.
4. This number is the LCM.

example

Find the LCM of 15 and 20 by listing multiples.

Solution:

List the first several multiples of 15 and of 20 . Identify the first common multiple.

15:	15	30	45	60	75	90	105	120	...
20:	20	40	60	80	100	120	140	160	...

The smallest number to appear on both lists is 60 , so 60 is the least common multiple of 15 and 20 .

Notice that 120 is on both lists, too. It is a common multiple, but it is not the least common multiple.

try it



[See this interactive in the course material.](#)

In the next video we show an example of how to find the Least Common Multiple by listing

multiples of each number.



[Video Link](#)

Prime Factors Method

Another way to find the least common multiple of two numbers is to use their prime factors. We'll use this method to find the LCM of 12 and 18 .

We start by finding the prime factorization of each number.

$$12 = 2 \cdot 2 \cdot 3 \quad 18 = 2 \cdot 3 \cdot 3$$

Then we write each number as a product of primes, matching primes vertically when possible.

$$\begin{array}{l} 12 = 2 \cdot 2 \cdot 3 \\ 18 = 2 \cdot 3 \cdot 3 \end{array}$$

Now we bring down the primes in each column. The LCM is the product of these factors.

Notice that the prime factors of 12 and the prime factors of 18 are included in the LCM. By matching up the common primes, each common prime factor is used only once. This ensures that 36 is the least common multiple.

Find the LCM using the prime factors method

1. Find the prime factorization of each number.
2. Write each number as a product of primes, matching primes vertically when possible.
3. Bring down the primes in each column.
4. Multiply the factors to get the LCM.

example

Find the LCM of 15 and 18 using the prime factors method.

Show Solution

Solution:

Write each number as a product of primes.	
Write each number as a product of primes, matching primes vertically when possible.	
Bring down the primes in each column.	
Multiply the factors to get the LCM.	$\text{LCM} = 2 \cdot 3 \cdot 3 \cdot 5$ The LCM of 15 and 18 is 90 .

try it



[See this interactive in the course material.](#)

example

Find the LCM of 50 and 100 using the prime factors method.

Show Solution

Solution:

Write the prime factorization of each number.	$50 = 2 \cdot 5 \cdot 5$ $100 = 2 \cdot 2 \cdot 5 \cdot 5$
Write each number as a product of primes, matching primes vertically when possible.	$50 = 2 \cdot 5 \cdot 5$ $100 = 2 \cdot 2 \cdot 5 \cdot 5$
Bring down the primes in each column.	
Multiply the factors to get the LCM.	$\text{LCM} = 2 \cdot 2 \cdot 5 \cdot 5$ The LCM of 50 and 100 is 100 .

$100 \text{ is } 100$

try it



[See this interactive in the course material.](#)

In the next video we show how to find the Least Common Multiple by using prime factorization.



[Video Link](#)

Licenses and Attributions

CC licensed content, Original

- Question ID: 145462, 145459, 145458. **Authored by:** Alyson Day. **License:** [CC BY: Attribution](#). **License Terms:** IMathAS Community License CC-BY + GPL

CC licensed content, Shared previously

- Example: Determining the Least Common Multiple Using a List of Multiples. **Authored by:** James Sousa (Mathispower4u.com). **Located at:** <https://youtu.be/7twRSmgcrLM>. **License:** [CC BY: Attribution](#)
- Example: Determining the Least Common Multiple Using Prime Factorization. **Authored by:** James Sousa (Mathispower4u.com). **Located at:** <https://youtu.be/hZvRDG-HgMY>. **License:** [CC BY: Attribution](#)

CC licensed content, Specific attribution

- Prealgebra. **Provided by:** OpenStax. **License:** [CC BY: Attribution](#). **License Terms:** Download for free at <http://cnx.org/contents/caa57dab-41c7-455e-bd6f-f443cda5519c@9.757>

</div