Recall: The **multiples** of an integer are the products of that integer with the counting numbers.

Ex. The multiples of 8 are: 8, 16, 24, 32, 40, 48, 56,…

We are interested in finding common multiples for a set of counting numbers, and specifically the _________________. Let’s take a look at the multiples of 8 again, and compare them to the multiples of 12.

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 72, 80, 88, 96,…

Multiples of 12: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132,…

Notice that the common multiples between 8 and 12 are underlined. The least common multiple is _______.

Finding the least common multiple of 8 and 12 was not too difficult. But, what if we wanted to find the least common multiple of more than two numbers? Also, of numbers that are larger? We need a more efficient way to find the least common multiple.

**Finding the LCM:**

1. Find the prime factorization of each number.
2. Identify the prime factors that appear in any of the prime factorizations.
3. Form the product of these primes using each prime the most number of times it appears in any one of the prime factorizations.

*Example 1:* Find the least common multiple of the following sets of numbers.

a.) 6, 12 and 42

b.) 24, 32, 39 and 40
We can determine how many times a number divides into the LCM by looking at their prime factorizations (which we already found in Example 1).

**Example 2:** Determine the number of times each number divides into the LCM.

a.) 6 divides into the LCM ________ times  
b.) 24 divides into the LCM ________ times  
   12 divides into the LCM ________ times  
   32 divides into the LCM ________ times  
   42 divides into the LCM ________ times  
   39 divides into the LCM ________ times  
   40 divides into the LCM ________ times

https://www.youtube.com/watch?v=xJxdDx1bwvQ&index=27&list=PL9dj44OpeMZe_qNgDt_lgnR1cGNgkPq7

We can also find the LCM of algebraic terms. We follow a very similar process as the steps listed above.

**Finding the LCM of Algebraic Terms:**

1. Find the prime factorization of each term in the set and write in exponential form, including the variables.
2. Find the largest power of each prime factor present in all of the prime factorizations. (Remember that, if no exponent is written, the exponent is understood to be 1.)
3. The LCM is the product of these powers.

**Example 3:** Find the LCM of the following algebraic terms.

a.) $8a, a^2b, 12a^2, 15b^3$  
b.) $10x, 20xy^3, 30x^2y$
Applications

Example 4: Two truckers leave New Orleans at the same time. They take 21 and 14 days, respectively, to reach their destination and return to New Orleans. The truckers each take continuous trips to and from New Orleans. How many days will pass before the two truckers leave New Orleans on the same day again?

Example 5: Three co-workers are busy selling computers over the phone. In an 8-hour day, Mark can sell 13 computers, Debra can sell 7 computers, and Michelle can sell 14 computers. Find the LCM of the number of computers that each worker can sell in an 8-hour day.