Prime & Composite Numbers and GCF

Prime Numbers

A prime number only has two factors - the number 1 and itself.

Examples: 2 , 3, 5, 7, 11

All of these numbers ONLY have two factors

Composite Numbers

A composite number is the opposite of a prime number.

What do we think a composite number is? Let's come up with some examples.

- The number 1 is special! It's considered to be neither prime or composite

Prime Factorization of a Number

"Prime Factorization" is finding **which prime numbers** multiply together to make the original number.

Example 1: What are the prime factors of 12 ?

It is best to start working from the smallest prime number, which is 2, so let's check:

$$12 \div 2 = 6$$

Yes, it divided evenly by 2. We have taken the first step!

But, is 6 a prime number? No, so we need to divide again.

Let's try 2 again:

$$6 \div 2 = 3$$

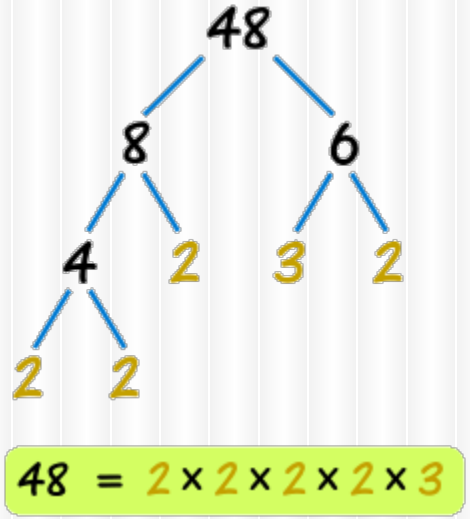
Yes, that worked also. And 3 **is** a prime number, so we have the answer:

$$\mathbf{12 = 2 \times 2 \times 3}$$

As you can see, **every factor** is a **prime number**, so the answer must be right.

Factor Tree Method

A "Factor Tree" can help: find **any factors** of the number, then the factors of those numbers, etc, until we can't factor any more.



$48 = 2 \times 2 \times 2 \times 2 \times 3$

The bottom row of numbers must all be prime numbers when we complete our factoring.

Greatest Common Factor (GCF)

Step #1 - Find all the Prime Factors of each number (using a factor tree)
Step #2 - Circle the prime numbers that each number has in common
Step #3 - Multiply those primes together

GCF

Example: What is the GCF of 12 & 16?

GCF

Example #2: What is the GCF between 36 and 54?