Finding HCF by Prime Factorisation

We have to follow some basic steps to find the HCF of two or more numbers by prime factorisation method:

Step 1: Write each number as a product of its prime factors. This method is called here **prime factorization**.

Step 2: Now list the common factors of both the numbers

Step 3: The product of all common prime factors is the HCF (use the lower power of each common factor)

Let us understand with some Examples:

Example 1: Evaluate the HCF of 60 and 75.

Solution: Write each number as a product of its prime factors.

$2^2 \times 3 \times 5 = 60$

$3 \times 5^2 = 75$

The product of all common prime factors is the HCF.

The common prime factors in this example are 3 & 5.

The lowest power of 3 is 1 and 5 is 1.

So, HCF = 3 x 5 = 15

Example 2: Find the HCF of 36, 24 and 12.

Solution: Write each number as a product of its prime factors.

$2^2 \times 3^2 = 36$

$2^3 \times 3 = 24$

$2^2 \times 3 = 12$

The product of all common prime factors is the HCF (use the lowest power of each common factor)

The common prime factors in this example are 2 & 3.

The lowest power of 2 is 2 and 3 is 1.

So, HCF = 2^2 x 3 = 12