

# Factors & Multiples Reference

Key definitions, prime numbers, GCF, LCM, and divisibility rules all in one place.

## Factors vs. Multiples

**Factor:** A number that divides evenly into another (no remainder)

**Example:** Factors of 12: 1, 2, 3, 4, 6, 12

**Multiple:** The result of multiplying a number by any whole number

**Example:** Multiples of 5: 5, 10, 15, 20, 25, ...

## Prime Numbers

**Definition:** A number with exactly 2 factors: 1 and itself

**Note:** 1 is NOT prime (only 1 factor)

**First 25 primes:**

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

## GCF (Greatest Common Factor)

**Method 1:** List all factors of each number, find the largest shared factor

**Example:** GCF of 18 and 24

**18:** 1, 2, 3, 6, 9, 18

**24:** 1, 2, 3, 4, 6, 8, 12, 24

**GCF:** 6 (largest common factor)

**Method 2:** Prime factorization, multiply shared primes

**18 = 2 x 3 x 3**

**24 = 2 x 2 x 2 x 3**

**GCF:** 2 x 3 = 6

## LCM (Least Common Multiple)

**Method 1:** List multiples until you find the first shared one

**Example:** LCM of 6 and 8

**6:** 6, 12, 18, 24, 30, ...

**8:** 8, 16, 24, 32, ...

**LCM:** 24 (first common multiple)

**Method 2:** Prime factorization, take highest power of each prime

**6 = 2 x 3**

**8 = 2 x 2 x 2**

**LCM:** 2 x 2 x 2 x 3 = 24

Divisible by	Rule	Example
2	Last digit is even (0, 2, 4, 6, 8)	138 (8 is even)
3	Sum of digits divisible by 3	234: 2+3+4=9
4	Last two digits divisible by 4	316: 16/4=4
5	Last digit is 0 or 5	475 (ends in 5)
6	Divisible by both 2 and 3	132 (even, 1+3+2=6)
8	Last three digits divisible by 8	1,024: 024/8=3
9	Sum of digits divisible by 9	729: 7+2+9=18
10	Last digit is 0	350 (ends in 0)

**GCF is used to simplify fractions. LCM is used to find common denominators. Know both methods!**