## B BYJU'S

## Grade 06

## Maths Chapter Notes



# BBYJU'S Classes 

Chapter Notes

## Playing With Numbers

## Grade 06

## Topics to be Covered

## 1. Factors and Multiples

1.1. Factors
1.2. Multiples

## 3. Test for Divisibility of Numbers

## 5. Prime Factorization

7. Lowest Common Multiple
8. Prime and Composite Numbers
2.1. Prime Numbers
2.2. Composite Numbers
2.3. Even and Odd Numbers
9. Common Factors and Common Multiples
4.1. Co-Prime Numbers
10. Highest Common Factor

Important Questions

## Mind Map



## 1. Factors and Multiples

### 1.1. Factors

A factor of a number is an exact divisor of that number.
For example, 1, 2 and 4 divide the number 4 exactly. These numbers are called factors of 4.

- 1 is a factor of every number.

For example, $9=9 \times 1,4=4 \times 1$.

- Every number is a factor of itself. For example, $6=6 \times 1,11=11 \times 1$.
- Every factor is less than or equal to the given number. For example, factors of 6 are 1,2,3 and 6 which all are less than or equal to 6.
- The number of factors of a given number are finite.
- A number for which sum of all its factors is equal to twice the number is called a perfect number. For example, the factors of 6 are 1,2,3 and 6 and $1+2+3+6=12$. Hence, 6 is a perfect number.


## 1. Factors and Multiples

### 1.2. Multiples

A number is a multiple of each of its factors.
For example, $24=2 \times 12$. Here, 2 and 12 are factors of 24 , whereas 24 is a multiple of 2 and 12 .

- The multiple of a number is greater than or equal to that number.
For example, multiple of 9 are $9,18,27, \ldots$ each of which is greater than or equal to 9 .
- The number of multiples of a given number is infinite. For example, multiple of 5 are $5,10,15,20, \ldots$. which is endless.
- Every number is a multiple of itself. For example, $3=3 \times 1$.


## 2. Prime and Composite Numbers

### 2.1. Prime Numbers

The numbers other than 1 whose only factors are 1 and the number itself are called prime numbers.
For example, 2, 3, 5, 7, 11 etc.
There are 15 prime numbers from 1 to 50 and 25 from 1 to 100.

### 2.2. Composite Numbers

Numbers having more than two factors are called composite numbers.
For example, 4, 6, 8, 9, 10 etc.

### 2.3. Even and Odd Numbers

The numbers which are multiples of 2 are called even numbers. The rest of the numbers are called odd numbers.

For example, $2,4,6,8, \ldots$ are the even numbers and $1,3,5,7, \ldots$ are the odd numbers.

- 1 is neither a prime nor a composite number.
- 2 is the smallest prime number which is even and every prime number except 2 is odd.


## 3. Test for Divisibility of Numbers

| Divisibility by | Conditions |
| :---: | :---: |
| 2 | If a number has any of the digits $0,2,4,6,8$ in its ones place. For example, 122, 38, etc. |
| 3 | If the sum of the digits of the number is a multiple of 3 . <br> For example, 24, 341, etc. |
| 4 | A number with 3 or more digits is divisible by 4 if the number formed by its last two digits is divisible by 4. <br> For example, 284, 9160 etc. |
| 5 | The number has either 0 or 5 in its ones place. For example, 100520, 12985 etc. |
| 6 | If a number is divisible by 2 and 3 both. For example, 24, 222, 424 etc. |
| 8 | A number with 4 or more digits is divisible by 8 if the number formed by its last three digits is divisible by 8 . <br> For example, 11240, 3568 etc. |
| 9 | If the sum of the digits of a number is divisible by 9 . <br> For example, 72, 243 etc. |
| 10 | If a number has 0 in the ones place. For example, $10,20,30,40, \ldots$ |
| 11 | Find the difference between the sum of the digits at odd places (from the right) and the sum of the digits at the even places (from the right) of the number. <br> If the difference is either 0 or divisible by 11, then the number is divisible by 11. |

## 4. Common Factors and Common Multiples

### 4.1. Co-Prime Numbers

Two numbers having only 1 as a common factor are called co-prime numbers. For example, 4 and 15.

- If a number is divisible by another number then it is divisible by each of the factors of that number.
- If a number is divisible by two co-prime numbers then it is divisible by their product also.
- If two given numbers are divisible by a number, then their sum is also divisible by that number.
- If two given numbers are divisible by a number, then their difference is also divisible by that number.


## 5. Prime Factorization

When a number is expressed as a product of its prime factors only then such a factorisation of a number is called a prime factorisation.

For example, $12=2 \times 2 \times 3$ is prime factorisation of 12 .

Prime Factorization of 36


## 6. Highest Common Factor

The Highest Common Factor (HCF) of two or more given numbers is the highest (or greatest) of their common factors. It is also known as Greatest Common Divisor (GCD).

HCF of 20, 28 and 36

$20=2 \times 2 \times 5$
$28=2 \times 2 \times 7$
$36=2 \times 2 \times 3$
$2 \times 2 \times 3$
The common factor of 20,28 and 36 is 2 which is occurring twice.
Thus, HCF of 20,28 and 36 is $2 \times 2=4$.

## 7. Lowest Common Multiple

The Lowest Common Multiple (LCM) of two or more given numbers is the lowest (or smallest or least) of their common multiples.

LCM of 20, 25 and 30

| 2 | 20 | 25 | 30 |
| ---: | :--- | :--- | :--- |
| 2 | 10 | 25 | 15 |
| 3 | 5 | 25 | 15 |
| 5 | 5 | 25 | 5 |
| 5 | 1 | 5 | 1 |
|  | 1 | 1 | 1 |
|  |  |  |  |
| So, LCM $=2 \times 2 \times 3 \times 5 \times 5=300$. |  |  |  |

