

Board -F-6

Class - 6th

Topic - Prime and Composite Numbers

Introduction

Understanding **prime** and **composite** numbers is fundamental in mathematics. These concepts help us recognize how numbers are built and how they interact in arithmetic operations.

1 Prime Numbers

Definition

A **prime number** is a natural number greater than 1 that has exactly two distinct positive divisors: 1 and itself.

Key Properties

- Only two factors: 1 and the number itself.
- Cannot be divided evenly by any other number.
- 1 is **not** a prime number.
- The smallest prime number is 2, which is also the only even prime number.

Examples

Number	Is it Prime?	Reason
2	Yes	Divisors: 1, 2
3	Yes	Divisors: 1, 3
4	No	Divisors: 1, 2, 4 (more than 2)
5	Yes	Divisors: 1, 5
9	No	Divisors: 1, 3, 9 (more than 2)

List of Prime Numbers (1–30)

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

2 Composite Numbers

Definition

A **composite number** is a natural number greater than 1 that is not prime. It has more than two positive divisors.

Key Properties

- At least three factors: 1, itself, and at least one more.
- Can be written as a product of two or more smaller natural numbers.
- All even numbers greater than 2 are composite.

Examples

Number	Is it Composite?	Reason
4	Yes	Divisors: 1, 2, 4
6	Yes	Divisors: 1, 2, 3, 6
9	Yes	Divisors: 1, 3, 9
11	No	Divisors: 1, 11 (prime)
15	Yes	Divisors: 1, 3, 5, 15

List of Composite Numbers (1–30)

4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30

3 Special Cases

- 1 is neither prime nor composite.
- 2 is the only even prime number. All other even numbers are composite.

4 Prime Factorization

Prime factorization is expressing a composite number as a product of its prime factors.

Example:

$$12 = 2 \times 2 \times 3$$

(all are prime numbers)

5 How to Identify Prime and Composite Numbers

1. Check for divisibility:

- If a number has only two divisors (1 and itself), it is prime.
- If it has more than two divisors, it is composite.

2. Use divisibility rules:

- For small numbers, list all factors.
- For larger numbers, check divisibility by 2, 3, 5, etc.

6 Summary Table

Number Type	Definition	Examples
Prime	Only two factors: 1 and itself	2, 3, 5, 7, 11
Composite	More than two factors	4, 6, 8, 9, 10