

Whole Numbers

Class 6 Mathematics Notes

Complete Study Notes

Learning Objectives

In this chapter, students will learn the difference between natural numbers and whole numbers, understand the concepts of successor and predecessor, and use the number line to perform mathematical operations. They will also explore the important properties of whole numbers, including closure, commutative, associative, distributive, and identity properties. By the end of this chapter, students will be able to recognize number patterns and apply these concepts to solve mathematical problems quickly and accurately.

Introduction to Whole Numbers

The chapter Whole Numbers introduces students to one of the most important topics in Class 6 Mathematics. Whole numbers are used in almost every aspect of daily life, from counting people and objects to measuring quantities and solving mathematical problems. Understanding whole numbers helps students develop a strong numerical foundation that is essential for advanced mathematical concepts.

This chapter explains the relationship between natural numbers and whole numbers, demonstrates how to use a number line, introduces the properties of whole numbers, and shows how number patterns can simplify calculations.

Natural Numbers and Whole Numbers

Natural numbers are the counting numbers that begin from 1 and continue endlessly. These numbers are used whenever we count objects, people, or places. Whole numbers include all natural numbers along with 0, making zero the smallest whole number.

It is important to understand that every natural number is a whole number, but 0 is not a natural number. Students also learn about the concepts of successor and predecessor. The successor of a number is the number immediately after it, obtained by adding one, while the predecessor is the number immediately before it, obtained by subtracting one.

Understanding these concepts helps students compare numbers, arrange them correctly, and solve mathematical problems more efficiently.

Number Line

A number line is a straight line on which numbers are placed at equal distances. It provides a simple visual method for understanding the order of numbers and performing mathematical operations.

Moving towards the right on the number line represents larger numbers, while moving towards the left represents smaller numbers. Addition is performed by moving to the right, subtraction by moving to the left, and multiplication can be understood as repeated equal jumps from zero.

The number line is an important mathematical tool because it helps students visualize calculations and understand number relationships more clearly.

Properties of Whole Numbers

Whole numbers follow several important mathematical properties that make calculations easier and more systematic.

- **The Closure Property** states that the sum or product of two whole numbers is always a whole number. For example, adding 8 and 5 gives 13, which is also a whole number.
- **The Commutative Property** explains that changing the order of numbers during addition or multiplication does not change the answer. For example, $6 + 4$ is equal to $4 + 6$, and 5×3 is equal to 3×5 .
- **The Associative Property** states that changing the grouping of numbers during addition or multiplication does not affect the result. This property allows students to simplify longer calculations.
- **The Distributive Property** shows how multiplication can be distributed over addition or subtraction. For example, multiplying a number by the sum of two numbers gives the same result as multiplying each number separately and then adding the products.

Students also learn about Identity Elements. Zero is called the additive identity because adding zero to any whole number leaves it unchanged, while one is called the multiplicative identity because multiplying any whole number by one gives the same number.

These properties make arithmetic simpler and prepare students for algebra in higher classes.

Number Patterns and Mental Mathematics

Number patterns help students identify relationships between numbers and perform calculations more quickly. Recognizing patterns improves logical thinking and develops mental mathematics skills.

Students learn simple techniques that reduce lengthy calculations. For example, multiplying a number by 99 can be done by multiplying it by 100 and then subtracting the original number. Using this method,

$$84 \times 99 = 84 \times (100 - 1) = 8400 - 84 = 8316.$$

Understanding number patterns helps students solve mathematical problems faster and with greater confidence.

Practice Questions

1. Find the successor of 100199.
2. Solve $297 \times 17 + 297 \times 3$ using the properties of whole numbers.
3. Is subtraction commutative for whole numbers? Give a reason.

Answer Key

Answer 1

The successor of 100199 is 100200, because the successor of any whole number is obtained by adding 1.

Answer 2

Using the distributive property,

$$297 \times 17 + 297 \times 3 = 297 \times (17 + 3) = 297 \times 20 = 5940.$$

Answer 3

No, subtraction is not commutative for whole numbers. For example, $5 - 3 = 2$, but $3 - 5$ does not give the same result and is not a whole number. Therefore, changing the order of numbers changes the answer.