

RAM Maths Circle

November 23, 2025

Nagpur

Introduction

Binary numbers use the base-2 system, employing only two digits: 0 and 1. This system is fundamental in computing, where each digit, called a bit, represents an off or on state. Binary numbers are used to encode, process, and store all types of data within digital electronic devices. Values in binary are calculated by powers of 2, starting from the rightmost bit. The simplicity of two states makes binary ideal for computer hardware, enabling efficient data representation and operations like addition, subtraction, and multiplication.

Binary Numbers with different bases

Problems:

1. Find and observe different patterns between bases other than 10.
2. Methods to convert the numbers from one base to another base.

Explorations

Students made the following observations while comparing others bases number with base 10 binary number.

1. Divisible of 5 base 10 = Divisible of 4 in base 8.
2. Divisible of 9 in base 10 = Divisible of 4 in base 8.
3. Divisible of 3 in base 10 = Divisible of 4 in base 9.
4. Divisible of 3 in base 10 = Divisible of 3 in base 7.