CHAPTER 02

Whole Numbers

Patterns in whole numbers:

Patterns:

- A pattern is a sequence of numbers or pictures.

  Here are some patterns of shapes.

  1. In the first arrangement, cylinders are kept horizontal and vertical alternatively.

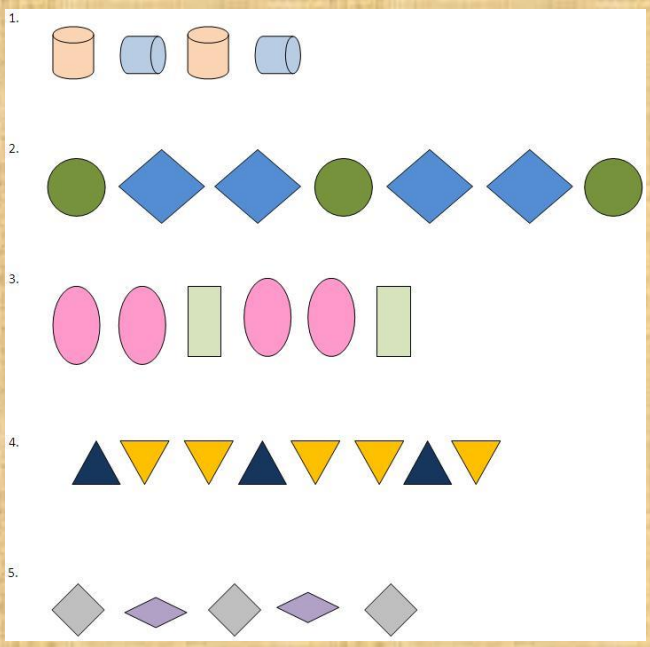
  2. In the second, there are two quadrilaterals in-between two circles.

  3. There is a vertical rectangle placed after every two ovals.

  Similarly, observe the other two.

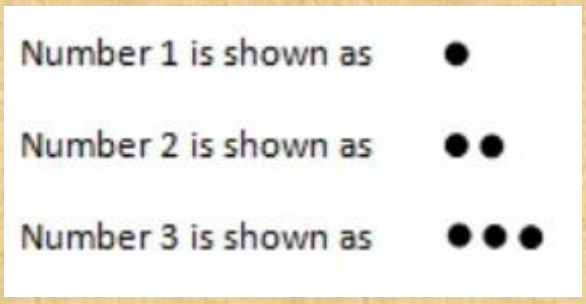
  In all these examples, there color patterns to.

Hence A pattern is something that repeats in a sequence.



Similarly, numbers can also be written in a certain sequence.

- Every number can be arranged as a line.
- We can arrange numbers in elementary shapes consisting of dots.



Some numbers like 3, 6 and 10 can be arrange as a triangle.

Some numbers like 4, 9 and 16 can be arrange as a square

Some numbers like 6, 8 and 10 can be arrange as a rectangle.

How we use the actual numbers in the pattern?

Let us look at these examples.

Multiply 3 by 9, 99, 999, and 9999.

Let us study the pattern.

3 x 9 can be written as 3 (10 – 1) = 27

3 x 99 can be written as 3 x (100 – 1) = 297

3 x 999 can be written as 3 x 1000 – 1 = 2997

3 x 9999 = 3 (10000 – 1) = 29997

Here we have seen a shortcut to multiply 9.

EXAMPLE 2

Study this example carefully.

44 x 5 can be written as 44 x 10/2 = 22 x 10 = 220 x 1

4 x 10 can be written as 44 x 20/2 = 22 x 20 = 220 x 2

So forth and so on.

By using pattern, we are able to multiply or add numbers quickly.

Example 3

In this example 9, 98, 987, 9876, 98765 is in the descending order of the digits.

We can get these numbers by following a pattern once again.

1 x 8 + 1 = 9

12 x 8 + 2 = 98

123 x 8 + 3 = 987

And so on.

You observe that as the multiplicand increases from 1 to 2 digit to 3 digit numbers and added to 1 , 2 , 3 respectively we get the desired numbers.

Example 4

1. 65 × 99 = 65 (100 - 1) = 6500 - 65 = 6435

2. 65 × 999 = 65 (1000 - 1) = 65000 - 65 = 64935

3. 65 × 9999 = 65 (10000 - 1) = 650000 - 65 = 649935

Here, we can see a shortcut to multiply a number by numbers of the form 9, 99, 999, ...

This type of shortcuts enables us to do sums mentally.