Percent and Percentage

- **Percentages** are numerators of fractions with denominator 100. It is represented by the symbol % and means hundredths too, i.e., 25% $= \frac{25}{100} =$ 0.25
- Fractional numbers, whole numbers and decimals can be converted into percentages by multiplying them by 100%.

  Note: Percentages related to proper fractions are less than 100 whereas percentages related to improper fractions are more than 100.

  For example, $1\frac{1}{4} = \frac{5}{4} \times 100\% = 125\%$

- To convert ratio to percentage, we proceed as follows:

  Consider the ratio a:b.

  Sum of parts = $a + b$

  Percantage form = $\frac{a}{a+b} \times 100\%$

- Percentages can be converted into fractions or decimals by dividing them by 100.

  For example, 35% can be converted to decimals and fraction as follows:

  $35\% = \frac{35}{100} = 0.35$

  $35\% = \frac{35}{100} = \frac{7}{20}$

- To convert percentage to ratio, we have to find the ratio of the percentages of the two quantities.
- When added, all parts of a whole give whole or 100%.

- To express x as a percentage of y, percentage = $\left(\frac{x}{y}\times 100\right)\%$
- x % of a given quantity = $\frac{x}{100}\times$ **given quanity**
- If x % of a given quantity is y, then quantity = $\frac{y}{x}\times$ **100**

Example: In a bag there are 6 blue marbles, 4 red marbles and 5 green marbles. What percent of total marbles are blue?
Solution: Total number of marbles = 6 + 4 + 5 = 15
Number of blue marbles = 6
∴ Percentage of blue marbles = $\frac{6}{15}\times 100 = 40\%$

- Formula for percentage increase and decrease are:

$$\text{Percentage increase} = \frac{\text{Increase in the value}}{\text{Original value}}\times 100$$

$$\text{Percentage decrease} = \frac{\text{Decrease in the value}}{\text{Original value}}\times 100$$

Example: In the year 2007, the number of children in a locality was 1500. In the year 2008, the number of children in the locality rose to 2100. Find the percent increase in the number of children of the locality.

Solution:

Increase in the number of children = 2100 – 1500 = 600

Percent increase $= \frac{600}{1500}\times 100 = 40\%$

Thus, the required percent increase in the number of children of the locality is 40%.