

# Chapter 8

## Comparing Quantities

### Introduction

- In our daily life, there are many occasions when we compare two quantities such as comparing height, weight etc.
- To compare two quantities, the units must be the same.

### Ratios

- A ratio compares two quantities using a particular operation.
- The ratio of two quantities of the same kind and in the same units is fraction that shows how many times the one quantity is of the other.
- The ratio of two quantities  $a$  and  $b$  ( $b \neq 0$ ) is  $a \div b$  or  $a/b$  and is denoted by  $a:b$ .
- Two ratios can be compared by converting them into like fractions. If the two fractions are equal, we say that the two given ratios are equivalent.
- If the two ratios are equal then the involved four quantities are said to be in proportion.
- Four numbers  $a, b, c, d$  are said to be in proportion if  $a:b=c:d$  and we write,  $a:bc:d$ .

Percentage – another way of comparing quantities

- Per cent is derived from Latin word 'per centum' meaning 'per hundred'.
- Percentages are numerators of fractions with denominator 100.
- Per cent is represented by the symbol % and means hundredths too. That is 1% means 1 out of hundred or one hundredth. It can be written as:  $1\% = 1/100 = 0.01$ .

### **Conversion**

- To convert a fraction into percent, multiply the fraction by 100 and write % sign.
- To convert percent into decimals, drop the sign of percent and shift the decimal point two places to the left.
- To convert a decimal into percent, shift the decimal point two places to the right side and write % sign.

### **Use of Percentages**

- When parts of a quantity are given to us as ratios, we need to convert those to percentages.
- The percent of increase tells what per cent the amount of increase, of the original number.

Percent of increase =  $\text{Amount of increase} / \text{Original number} \times 100$

- There are times when we need to know the increase or decrease in a certain quantity as percentage.

Percent of decrease =  $\text{Amount of decrease} / \text{Original number} \times 100$ .

## **Buying and Selling**

- The buying price of any item is known as its cost price (CP).
- The price at which an item is sold is known as its selling price (SP).
- If  $CP < SP$ , then a profit is made and  $\text{profit} = SP - CP$ . If  $CP = SP$ , there is no profit or loss.
- If  $CP > SP$ , then a loss is made and  $\text{Loss} = CP - SP$ .
- $\text{Profit percent} = \text{Profit} / CP \times 100$
- $\text{Loss percent} = \text{Loss} / SP \times 100$

## **Simple Interest**

- The money you borrow is known as sum borrowed or principal.
- For keeping the money for some time the borrower has to pay some extra money to the bank which is known as Interest.
- The period for which the money is borrowed is called 'Time Period' (T).

- Total money paid by the borrower to the lender is called the amount.

Amount = Principal + Interest

- Rate of interest is generally given in percent per year.
- Simple Interest (S.I.):  $P \times R \times T / 100$ .
- Percentage to Fractions: Drop the percent sign and divide the number by 100.
- Percentage to Decimals: First convert the given percentage into fraction with denominator as 100 and then put the fraction into decimal form.