

# Comparing Quantities Class 8 Notes: Chapter 8

Comparing Quantities Class 8 Notes given here has been carefully put together by experts to help students understand all the concepts given in chapter 8 clearly and at the same time allow them to practice sums effectively. The notes are further designed to help students complete timely revisions and score better marks in the exams.

Also check: [NCERT Solutions For Class 8 Maths Chapter 8](#)

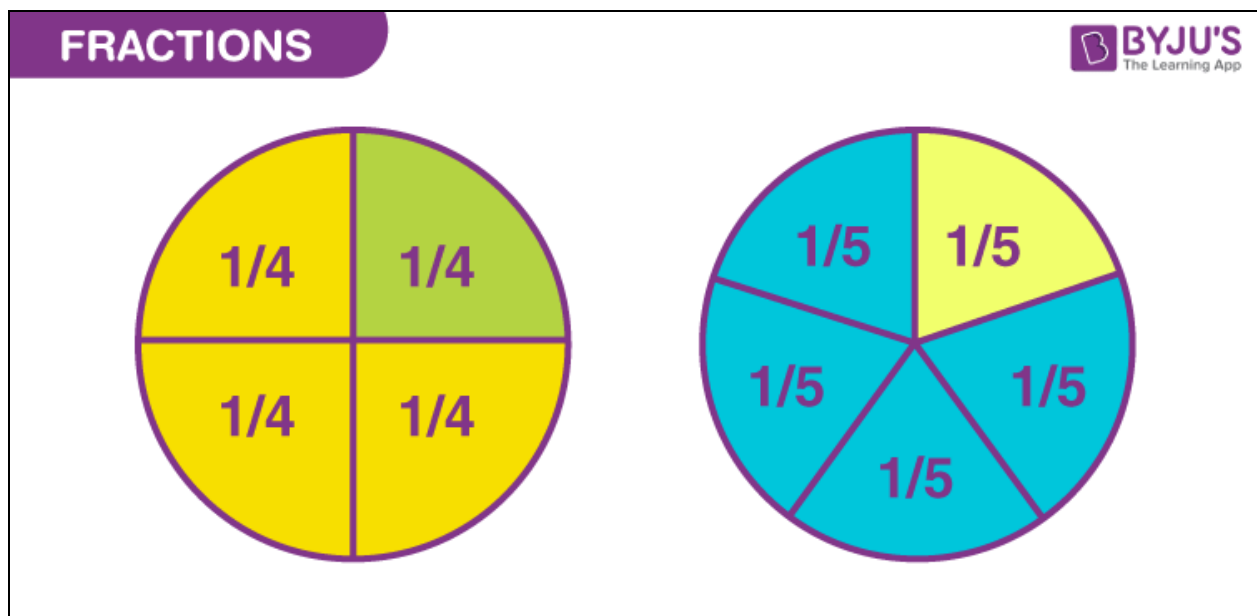
## Introduction to Fraction, Ratios and Percentages

In this chapter “Comparing quantities”, students of Class 8 will learn to find the Discount when discount percentage is given. Also, we will learn here cost price, sales tax, GST (Goods and Services Tax), along with compound interest.

## Fractions, Ratios and Percentages

A **fraction** represents a **part of a whole** which consists of **numerators** and **denominators** and it is the division of two **same quantities**.

Eg:  $1/4$ ,  $1/5$ ,  $2/3$ , etc.



To know more about Fractions, [visit here](#).

**Ratio** is the comparison of one value to the other or the **comparison of two different quantities**.

Eg:3:5

Percentage is a value that expresses the part of a whole or a fraction of 100. For example, 10% of 100 is equal to  $1/10$  of 100, i.e., 10.

## Finding the Increase or Decrease in Percent

### Finding Increase or Decrease Percentage in Situations

Finding new number, when there is **increase** in percentage.

New number = original number + (increase in percentage  $\times$  number)

**Example : The Cost of a mobile phone is Rs 15,000. Find the new price if there is a increase of 5%**

New price = original price + 5% of original price

New price =  $15,000 + (5/100 \times 15,000)$

New price =  $15,000 + 750 = 15,750$

Here Rs 750 is **increase** in the price.

The new number can be found out using,

New number = original number  $\times$  percentage increase

Eg : New price =  $15,000 \times 105 \div 100 = 15,000 \times 1.05 = 15,750$

Finding new number, when there is decrease in percentage.

New number = original number – (decrease in percentage  $\times$  number)

Also, New number = original number  $\times$  percentage decrease

Eg : The Cost of a mobile phone is Rs 15,000. Find the new price if there is a decrease of 5%

New price =  $15,000 \times 95 \div 100 = 15,000 \times 0.95 = 14,250$

To know more about Percentage Increase or Decrease, [visit here](#).

## Finding Discounts

### Finding SP without Finding Discount Percentage

A **reduction** (decrease) on the **marked price** is known as **discount**.

If the discount is given in numbers then it is calculated by

**Discount = Marked price – Sale price**

If the discount is given in percentage then it is calculated by:

**Discount = Discount % of Marked price**

## Finding Discounts

If the **discount** is given in numbers.

Example : Marked price of a shirt is Rs 535. Its selling price is Rs 495. Find the discount.

Solution : Discount = Marked price – Sale price

Discount = Rs 535 – Rs 495 = Rs 40

If the **discount** is given in percentage.

Example : A toy priced Rs 500 is available at a discount of 5%. Find the discount.

Solution : Discount = 5% of 500 =  $\frac{5}{100} \times 500$

Discount = Rs 25

To know Discount Formula, [visit here](#).

## Estimation of Amounts (In Percentages)

Estimating **amounts** when there is a **discount** or **hike** on the marked price.

**Example** : Anil bought a pair of shoes priced Rs 650, at a discount of 10%. Find the billing amount.

**Solution** : Billing amount = Marked price – discount

Billing amount = Rs 650 –  $(\frac{10}{100}) \times 650$

Billing amount = Rs 650 – Rs 65 = Rs 585

**Example** : Shilpa bought a new mobile for Rs 15,000. She has to pay 2% as delivery charges.

Find the billing amount.

**Solution** : Billing amount = Marked price + Hike

Billing amount = Rs 15,000 +  $(\frac{2}{100}) \times 15000$

Billing amount = Rs 15,000 + Rs 300 = Rs 15,300

## Prices Related to Buying and Selling

### Prices / Charges Related to Buying and Selling

Profit = Selling price – Cost price

$$\text{Profit \%} = (\text{Profit}/\text{Cost Price}) \times 100$$

$$\text{Loss} = \text{Cost price} - \text{Selling price}$$

$$\text{Loss \%} = \text{Loss}/\text{Cost Price} \times 100$$

## Finding Prices / Charges Related to Buying and Selling

**Example :** A shopkeeper sold a T.V priced Rs 12,000 at Rs 13,500. Find his profit percentage.

$$\text{Profit} = \text{Selling price} - \text{Cost price}$$

$$\text{Profit} = \text{Rs } 13,500 - \text{Rs } 12,000 = \text{Rs } 1,500$$

$$\text{Profit \%} = (\text{Profit}/\text{Cost price}) \times 100$$

$$\text{Profit \%} = (1500/12000) \times 100 = 12.5\%$$

**Example :** Amit sold his laptop, priced Rs 20,000 at Rs 18,000. Find his loss percentage.

$$\text{Loss} = \text{Cost price} - \text{Selling price}$$

$$\text{Loss} = \text{Rs } 20,000 - \text{Rs } 18,000 = \text{Rs } 2000$$

$$\text{Loss \%} = (\text{Loss}/\text{Cost Price} \times 100)$$

$$\text{Loss\%} = (2000/20000) \times 100 = 10\%$$

To know more about Profit and Loss, [visit here](#).

## Sales Tax and Value Added Tax

### Sales Tax / VAT

**Sales tax** or **value added tax(VAT)** is the **tax** that should be **paid to the government** on sale of an item

and it is **added to the bill amount**.

Normally, VAT is included in the price of items like groceries.

### Finding Sales Tax / VAT

$$\text{Sales tax or VAT} = \text{Tax \% of Selling price}$$

$$\text{Billing Amount} = \text{Selling price} + \text{VAT}$$

**Example :** Megha bought a wrist watch for Rs 1,200 and VAT is charged at 8%. Calculate the VAT and billing amount.

VAT = Tax % of selling price

VAT = 8% of 1,200 =  $8/100 \times 1200$  = Rs 96

Billing amount = S.P + VAT = Rs 1,200 + Rs 96 = Rs 1296.

## Simple and Compound Interest

### Simple Interest

**Simple interest** is the **extra money** charged on a loan where the **principal amount will be fixed** for a **particular time** period.

Interest is the extra money that a bank gives for saving or depositing money with them.

Similarly, when anybody borrow money, they pay interest.

Simple interest =  $(P.T.R)/100$

where,

P is the principal amount

T is the number of years

R is the interest rate

To know more about Simple Interest, [visit here](#).

### Calculating CI

**Compound interest** is the interest, calculated on the **principal** and the **interest for the previous period**.

The **principal** amount **increases with every time period**, as the **interest** payable is **added to the principal**.

Eg : Find CI on Rs 10,000 for 2 years at an interest rate of 5%.

Ans : Interest for the 1st year

For 1st year, P = 10,000, T = 1 year, R = 5%

$I_1 = PTR/100$

$= (10000 \cdot 1 \cdot 5)/100$

= Rs.500

$$A = P + I_1 = 10,000 + 500 = 10,500$$

Interest for the 2nd year

For 2nd year,  $P = 10,500$ ,  $T = 1$  year,  $R = 5\%$

$$I_2 = PTR/100$$

$$= (10500 \cdot 5)/100$$

$$= \text{Rs } 525$$

$$\text{Cost Price, C.I.} = I_1 + I_2 = \text{Rs } 500 + \text{Rs } 525 = \text{Rs } 1025$$

## Deducing a Formula for Compound Interest

### Formula for Cost Price

Calculation of **compound interest** can be generalized.

Let  $P_1$  be the sum on which the interest is compounded annually at the rate of  $R$

Then the interest for the 1st year,

$$I_1 = PTR/100$$

$$= P_1 \cdot R/100$$

$$A_1 = P_1 + I_1 = P_1 + P_1 \cdot R/100$$

$$A_1 = P_1(1 + R/100) = P_2$$

For 2nd year,

$$P_2 = P_1(1 + R/100)$$

$T = 1$  year and  $R = R\%$

$$I_2 = (P_2 \cdot R)/100$$

$$= P_2 \cdot R/100$$

$$I_2 = P_1(1 + R/100) \times R/100$$

$$I_2 = P_1 R/100(1 + R/100)$$

$$A_2 = P_2 + I_2$$

$$A_2 = P_1(1 + R/100) + P_1 R/100(1 + R/100)$$

Taking  $P_1(1 + R/100)$  as common, we get;

$$A_2 = P_1(1 + R/100)(1 + R/100)$$

$$A_2 = P_1(1 + R/100)^2$$

Continuing this way, the amount at the end of n years will be,

$$A_n = P(1 + R/100)^n$$

Where, P is the principal amount, R is the rate of interest and n is the number of years.

We get the formula for the amount to be paid at the end of n years.

Compound Interest can be calculated using the formula,

$$CI = A - P$$

## Rate Compounded Annually and Half Yearly

### Rate Compounded Annually or Half-Yearly

If interest is **compounded annually**,

time span, n = 1 year, here the principal amount **varies yearly**.

Principal amount (A=P+I1) for first year will serve as the principal for the second year.

If interest is compounded half – yearly,

time span, n = 6 months, here the principal amount varies half – yearly.

Principal amount (A=P+I1) for first 6 months will be the principal for the next 6 months.

### Finding CI When Rate Compounded Annually or Semi – Annually

When compound interest is compounded annually,

$$A = P(1 + R/100)^n$$

$$CI = A - P$$

Where, P is the principal amount, R is the rate of interest and n is the number of years.

When compound interest is compounded half yearly, the **interest rate will be half of the annual interest rate** and the **time period will be doubled**.

$$A = P(1 + R/200)^{2n}$$

$$CI = A - P$$

Where, P is the principal amount, R is the rate of interest and n is the number of years.

To know more about Compound Interest, [visit here](#).

## Application of Compound Interest

### Application of Formula of CI

**Application of compound interest** are :

1. To calculate the growth rate of population (increase or decrease).
2. To calculate change in the price of an item (increase or decrease).

**Example :** If the population of a town increases 2% annually and the present population is 3,26,40,000, find its population after 2 years.

**Solution.**  $P = 3,26,40,000$   $n = 2$  years,  $R = 2\%$

Therefore, Population after 2 years

$$A = P(1 + R/100)^n$$

$$A = 32640000(1 + 2/100)^2$$

$$A = 32640000 \times (51/50)^2$$

$$A = 32640000 \times (51/50) \times (51/50)$$

$$A = 13056 \times 51 \times 51$$

$$\Rightarrow A = 33958656$$

$\therefore$  The population after 2 years is 3,39,58,656.

**Example :** A motorcycle is bought at Rs 1,60,000. Its value depreciates at the rate of 10% per annum. Find its value after 2 years.

**Solution.**  $P = 1,60,000$   $n = 2$  years,  $R = 10\%$

$$A = P(1 - R/100)^n$$

$$A = 160000 \times (1 - 10/100)^2$$

$$A = 160000 \times 9/10 \times 9/10$$

$$A = 129600$$

$\therefore$  The value of the motorcycle after 2 years is Rs 1,29,600.

## Related Articles

[Chapter 8: Comparing Quantities Important Questions](#)



## Frequently asked Questions on CBSE Class 8 Maths Notes Chapter 8: Comparing Quantities

What is the formula for 'Profit and loss'?

The formula for the profit and loss percentage is: Profit percentage =  $(\text{Profit}/\text{Cost Price}) \times 100$ . Loss percentage =  $(\text{Loss}/\text{Cost price}) \times 100$ .

What is 'Sales tax'?

Sales tax is an amount of money, calculated as a percentage, that is added to the cost of a product or service when purchased by a consumer at a retail location.

What is 'Compound interest'?

Compound interest is the interest which is earned on interest.