13 Profit, Loss and Unitary Method
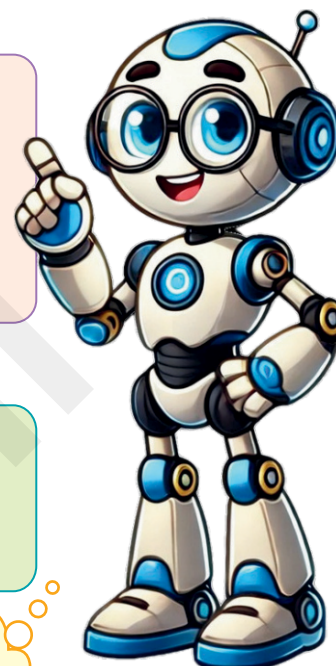
We'll cover the following key points:

→ Unitary Method

→ Cost Price and Selling Price

→ Finding SP and CP

**Do you Remember fundamental concept in previous class.
In class 4th we learnt**

→ Unitary Method

Still curious? Talk to me by scanning the QR code.

EeeBee

Learning Outcomes

By the end of this chapter, students will be able to:

- Understand the concepts of profit and loss in real-life situations.

- Calculate profit or loss based on cost price and selling price.

- Identify the percentage profit or loss using the formula:

- Profit Percentage = $\dfrac{\text{Profit}}{\text{Cost Price}} \times 100$

- Loss Percentage = $\dfrac{\text{Loss}}{\text{Cost Price}} \times 100$

- Solve problems involving the calculation of profit and loss in simple transactions.

- Understand the concept of the unitary method for solving problems related to cost, price, and quantity.

- Apply the unitary method to find the cost, quantity, or price of a single unit and then calculate the required values for multiple units.

Warm Up

Around the world, the currency way, search and find the currencies of as many countries as you can.

A	D	J	X	F	U	B	E	K	H	G
C	O	I	Y	R	I	N	G	G	I	T
B	L	I	R	A	S	V	V	R	U	E
F	L	U	Z	N	T	P	O	U	N	D
H	A	Q	E	C	R	W	V	K	N	D
K	R	O	N	E	O	R	I	Y	A	L
G	O	S	G	U	N	U	P	Y	I	O
J	M	T	H	R	U	P	E	E	R	N
I	P	E	S	O	L	I	V	N	A	M
K	N	Z	I	K	M	A	L	X	V	T
R	O	U	B	L	E	H	K	J	U	Z

1.	Australia	8.	Nigeria
2.	Denmark	9.	Philippines
3.	European Union	10.	Saudi Arabia
4.	India	11.	Switzerland
5.	Indonesia	12.	Turkey
6.	Japan	13.	United Kingdom
7.	Malaysia	14.	Russia

Unitary Method

When we go to shop to buy some articles, we ask the shopkeeper for the price of articles. The cost price of one article helps us to find the cost of the number of same articles. We would like to buy. This method of calculation is called **unitary method**.

If the cost of a number of things is given, we can find the cost of any other number of similar things. First, we have to find the cost of a thing, then multiply this cost by the number of things whose cost is to be calculated.
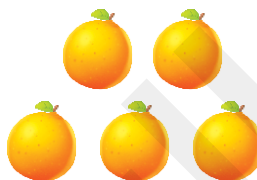
Which is a better buy?

Hemanta pays ₹40 for 4 oranges.

4 oranges cost ₹40

1 orange costs 40 ÷ 4 = ₹10

Hemanta pays ₹35 for 5 oranges.

5 oranges cost ₹35

1 orange costs 35 ÷ 5 = ₹7

Thus, 5 oranges for ₹35 is a better buy!

Hemanta used the unitary method to find the answer. The unitary method involves two steps.

Step 1: Divide to find the unit price.

Step 2: Multiply to find the total amount.

Example 1 : If one pen costs ₹8, find the cost of 7 such pens.

Solution : Cost of 1 pen = ₹8

Cost of 7 pens = ₹8 × 7 = ₹56

Example 2 : 8 pencil boxes cost ₹160. How much does Priya pay for 2 pencil boxes?

Solution : Price of 8 pencil boxes = ₹160

Price of 1 pencil box (Unit price) = 160 ÷ 8 = ₹20

Price of 2 pencil boxes = 20 × 2 = ₹40

Thus, Priya pays ₹40 for 2 pencil boxes.

Example 3 : How much will Ajay pay for 9 pastries if 4 pastries cost ₹120?

Solution : Cost of 4 pastries = ₹120

$$\text{Cost of 1 pastry (Unit price)} = 120 \div 4 = ₹30$$

$$\text{Cost of 9 pastries} = 30 \times 9 = ₹270$$

Thus, Ajay will pay ₹270 for 9 pastries.

Mental Math

Critical Thinking

Fill in the blanks:

1. If the cost of 5 L of milk is ₹125, the cost of 2 L milk will be _____ .

2. 8 notebooks cost ₹40. _____ such notebooks will cost ₹20.

3. If 50 kg rice costs ₹1000, then for ₹500 we can buy _____ kg rice.

Exercise 13.1

Knowledge Application

1. **Fill in the blanks:**

    (a) The cost of 12 dolls is ₹1080. 1 doll will cost _____

    (b) 7 pens cost ₹49. So the cost of 1 pen will be _____

    (c) A dozen erasers cost ₹36, so 1 eraser costs _____

    (d) If 4 chocolates cost ₹60, the cost of a chocolate is _____

2. **Solve these word problems:**

    (a) The school fee for a term of 4 months is ₹1260. Find the annual fee.

    (b) A bag of 10 kg of rice costs ₹185. What will be the cost of 8 kg of rice?

    (c) How much will 8 books cost if 7 books cost ₹910?

    (d) The cost of 10 pencils is ₹26. What will be the cost of 4 pencils?

    (e) Mukesh can walk 36 km in 12 hours. How far can he walk in 6 hours ?

    (f) 12 kg vegetables cost ₹108. Find the cost of 5 kg vegetables.

    (g) Rent of a house for a year is 6000. Find the rent for 4 months.

Project Work

Conceptual Learning

Mona, Kapil and Shreya went for a trade fair, the collection of money with them is rupee 650 but Mona add 300 rupees by choice, Shreya buy a scarf from fair stall of rupee 200, then each of them enjoy ice cream of rupees 50 each, now what amount left with them.

Write the expression for money spend and solve for left amount.

_____

_____

Cost Price and Selling Price

Mohan, the shopkeeper, has bought diyas for Diwali from a wholesaler. He bought them at the rate of ₹5 per diya. He will sell these diyas to customers at the price of ₹7 per diya. For Mohan, the cost price of a diya is ₹5 and the selling price of a diya is ₹7.

Cost price (CP) is the price at which a shopkeeper buys articles from a wholesaler.

Selling price (SP) is the price at which a shopkeeper sells articles to his customers.

Profit or Loss

If SP > CP, the shopkeeper earns a profit.   Profit = SP − CP

If SP < CP, the shopkeeper suffers a loss.   Loss = CP − SP

Example 4: Ravi bought a table for ₹740 and paid ₹150 as transportation charges. He sold it for ₹1000. Did he earn a profit or suffer a loss?

Solution : Cost price of table = ₹740

Expenses on transport = ₹150

Actual cost price = 740 + 150 = ₹890

Selling price of table = ₹1000

SP > CP, so there was a profit.

Profit = SP − CP = 1000 − 890 = ₹110

Thus, Ravi earned a profit of ₹110.

Example 5: Dinesh made a profit of ₹57.50 on selling a pair of gloves for ₹225.00. What was the cost price of the pair of gloves ?

Solution :   Selling price = ₹225.00   Profit = ₹57.50

Cost price = Selling price − profit = ₹225.00 − ₹57.50 = ₹167.50

The cost price of the pair of gloves was ₹167.50

Take a Task

Watch Remedial

196

Example 6: Amit bought a bag of sugar for ₹1225 and sold it for ₹128 less. What was the selling price of the bag of sugar ?

Solution : Cost price = ₹1225   Loss = ₹128

Selling price = Cost price − Loss = ₹1225 − ₹128 = ₹1097

Example 7: By selling a sofaset for ₹3550, a shopkeeper earned ₹650 as profit. Find the cost price of the sofaset.

Solution : Selling price of the sofaset (S.P.) = ₹3550   Profit = ₹650

Therefore, cost price (C.P.) of the sofaset = S.P. − Profit

= ₹3550 − ₹650 = ₹2900

Thus, the cost of the sofaset is ₹2900.

Exercise 13.2

1. **Look at the cost price and selling price and find the profit or loss:**

	COST PRICE	SELLING PRICE	PROFIT/LOSS	AMOUNT
(a)	₹50	₹80	SP > CP Profit	80 − 50 = ₹30
(b)	₹228	₹115		
(c)	₹228	₹221		
(d)	₹35	₹15.25		
(e)	₹12.50	₹10.50		
(f)	₹288	₹500		
(g)	₹345	₹700		

2. **Solve these word problems.**

   (a) Rama bought a digital camera for ₹2585 and sold it for ₹2650. What was his profit?

   (b) Manu sold his watch for ₹1075. He had bought it for ₹200. What is his loss?

   (c) A vegetable vendor bought vegetables for ₹540 and sold them for ₹580. What was his gain or loss?

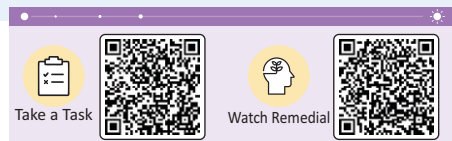   (d) Pushpa spent ₹75 in making colourful candles. She sold them for ₹80. Find her profit.

REMEMBER

Sometimes we use the term gain instead of the term profit. Both terms have the some meaning.

(e) A man bought a second-hand car ₹40,000. He spent ₹1750 on painting it. He sold it for ₹42,000. What was his gain or loss?

Finding SP and CP

Finding SP	**Finding CP**
When there is a profit	When there is a profit
Profit = SP – CP	Profit = SP – CP
So, SP = CP + profit	So, CP = SP – profit
When there is a loss	**When there is a loss**
Loss = CP – SP	Loss = CP – SP
So, SP = CP – loss	So, CP = SP + loss

Example 8 : Rajendra bought a camera for ₹2750. He sold it for a profit of ₹300. Find the selling price of the camera.

Solution : CP of the camera = ₹2750

Profit = ₹300

SP of the camera = CP + profit = 2750 + 300 = ₹3050

Thus, the selling price of the camera is ₹3050.

Example 9 : Kumar sold tomatoes for ₹20 per kg at a loss of ₹1.50 per kg.

What was the cost price of a kg of tomatoes?

Solution : SP = ₹20, loss = ₹1.50, CP = ?

CP = SP + loss = 20 + 1.50 = ₹21.50

Thus, the cost price of the tomatoes was ₹21.50 per kg.

Example 10: Rahul sold onions for ₹60 per kg at a profit of ₹10 per kg.

What was the cost price of a kg of onions?

Solution : SP = ₹60, profit = ₹10, CP = ?

CP = SP – profit = 60 – 10 = ₹50

Thus, the cost price of a kg of onions was ₹50.

1. **Find the selling price:**

	COST PRICE	PROFIT	LOSS	SELLING PRICE
(a)	₹3025	₹195	_____	
(b)	₹4000	_____	₹228	
(c)	₹719	₹35	_____	
(d)	₹3365	₹285	_____	
(e)	₹1295	_____	₹4000	

2. **Find the cost price :**

	SELLING PRICE	PROFIT	LOSS	COST PRICE
(a)	₹600	_____	₹35	
(b)	₹7181	₹397	_____	
(c)	₹799	₹18	_____	
(d)	₹7280	_____	₹163	
(e)	₹10,000	₹735	_____	

3. **Fill in the blanks :**

(a) A spoon is sold for ₹15 at a loss of ₹7. Its cost price is _____ .

(b) If something is bought and sold at the same price there is no _____ or _____ .

(c) When the selling price is less than the cost price, there is a _____ .

(d) When selling price is _____ than the cost price, there is a profit.

Solve these word problems.

1. The cost of 4 mugs is ₹80. Each mug is sold at a profit of ₹5. What will be the selling price of each mug?

2. If a kilogram of grapes costs ₹70, what would be the cost of 3 kg of grapes?

3. Sonal can buy 6 stamps for ₹50. How many stamps can she buy for ₹100?

4. Reema and Anu together have 100 rupees. Reema has ten rupees more than Anu. What is the share of each?

REMEMBER

➢ In the unitary method, first divide to find the unit price. Then multiply to find the total amount.

➢ The Cost Price (CP) is the price at which a shopkeeper buys articles from a wholesaler.

➢ The Selling Price (SP) is the price at which a shopkeeper sells articles to his customers.

➢ If SP > CP, there is a profit: Profit = SP – CP

➢ If SP < CP, there is a loss: Loss = CP – SP

Think Tank

Gap Analyzer™
Take a Test

1. **Tick (✓) the correct option.**

   (a) The price of a number of objects of the same kind is found by _____

        (i) division ☐   (ii) subtraction ☐

        (iii) multiplication ☐   (iv) none of these ☐

   (b) Monika bought 9 pens for ₹ 83.25. What is the cost of 1 pen?

        (i) ₹9.25 ☐   (ii) ₹10.25 ☐   (iii) ₹12.00 ☐   (iv) ₹9.50 ☐

   (c) If the selling price is more than the cost price, there is a _____

        (i) loss ☐   (ii) profit ☐   (iii) C.P. ☐   (iv) S.P. ☐

(d) If the cost of a dozen banana is ₹57, the cost of 1 banana will be _____

(i) ₹4.25 ☐ (ii) ₹5.00 ☐ (iii) ₹4.75 ☐ (iv) ₹4.50 ☐

2. Fill in the blanks:

(a) 3 sharpeners cost ₹12.₹ _____ is the cost of 1 sharpeners.

(b) If the cost of 5 L of milk is ₹125, the cost of 2 L milk will be _____

(c) If ₹36 is paid for 4 apples, ₹72 will be paid for _____ apples.

(d) If 50 kg rice costs ₹1000, then for ₹500 we can buy _____ kg rice.

(e) 8 notebooks cost ₹40. _____ such notebooks will cost ₹20.

3. Find the cost price:

SN	Selling Price	Profit	Loss	Cost Price
1	₹500	_____	₹31	
2	₹7181	₹397	_____	
3	₹685	₹15	_____	
4	₹7280	_____	₹163	
5	₹10,000	₹843	_____	

Custom Learning Path

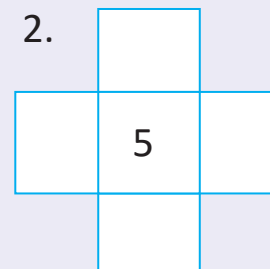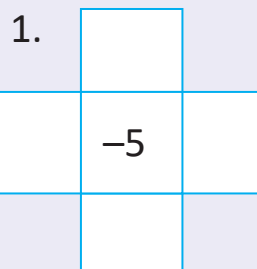Scan to Create Your Own Learning Path

Puzzle

As long as the number in the center of the cross is the same as the solution below, and the rows and columns contain the same numbers then the answer should work even if the numbers are in a different place.

1. −6, −4, 1, 2, 3, 5

   Total must be 3

2. −6, −5, 2, 3, 4, 7

   Total must be 0

1. −5

2. 5

Mental Math

Write the CP and SP on the blanks:

	CP	SP
1. Sunil buys bats at the rate of ₹125 per bat and sells them at ₹150 per bat.	_____	_____
2. Kapil sold a mobile phone for ₹2500 which he had bought for ₹2250.	_____	_____
3. Shankar sells pens at ₹25 per pen which he buys at ₹15 per pen.	_____	_____

Fun Time Activity

Problem Solving

1. A shopkeeper bought a chair for ₹250 and sold it later for ₹275. He made a profit of _____ .

2. A spoon is sold for ₹15 at a loss of ₹7. Its cost price is _____ .

3. If a kilogram of grapes cost ₹70. What would be the cost of 3 kg of grapes?

HOTS

Critical Thinking

Reema and Anu together have 100 rupees. Reema has ten rupees more than Anu. What is the share of each?